Caring for our People

50 years of healthcare in Singapore

Start

Caring for our People

This book is dedicated to all those in the healthcare sector who laid the foundations of a healthy nation in the years gone by, who devote themselves to caring for our people today and who are creating a better healthcare system for the generations to come.

SG 50

Prime Minister's Message

Good health is important for individuals, for families, and for our society. It is the foundation for our people's vitality and optimism, and a reflection of our nation's prosperity and success. A healthy community is also a happy one.

Singapore has developed our own system for providing quality healthcare to all. Learning from other countries and taking advantage of a young population, we invested in preventive health, new healthcare facilities and developing our healthcare workforce.

We designed a unique financing system, where individuals receive state subsidies for public healthcare but at the same time can draw upon the 3Ms – Medisave, MediShield and Medifund – to pay for their healthcare needs. As responsible members of society, each of us has to save for our own healthcare needs, pay our share of the cost, and make good and sensible decisions about using healthcare services.

Our healthcare outcomes are among the best in the world. Average life expectancy is now 83 years, compared with 65 years in 1965. The infant mortality rate is 2 per 1,000 live births, down from 26 per 1,000 live births 50 years ago.

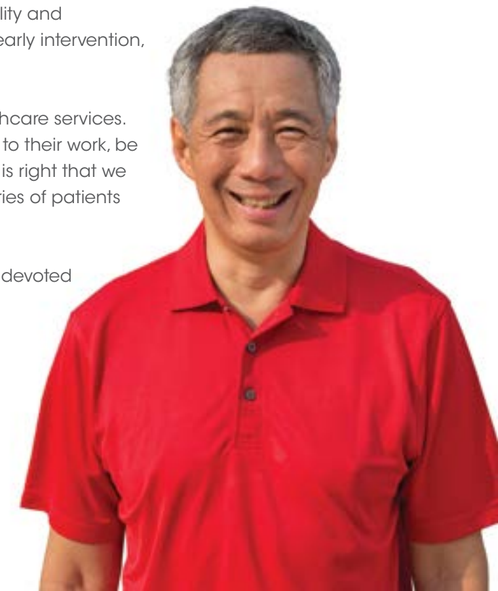
Government policies have adapted to the times. We started by focusing on sanitation and public health and went on to develop primary, secondary and tertiary health services. In recent years, we have enhanced government subsidies substantially to ensure that healthcare remains affordable. We introduced the Community Health Assist Scheme (CHAS) and the Pioneer Generation Package. MediShield Life will be introduced in November this year, a major milestone in providing life-long coverage and assurance to all Singaporeans.

While the Ministry of Health provides good and affordable healthcare services, individuals must do their part, adopting healthy living habits to stay healthy and active well into old age. I am glad to see more people doing this.

Healthcare professionals and providers need to play their part in delivering quality and cost-effective care to our people. By focusing on healthy living, prevention and early intervention, we can help Singaporeans to enjoy longer, healthier lives.

Singaporeans from all walks of life – including myself – make use of public healthcare services. We witness first-hand the dedication and passion that healthcare workers bring to their work, be they an ambulance driver, doctor, laboratory technician, nurse or pharmacist. It is right that we celebrate SG50 with them. This book tells many of their stories, alongside the stories of patients who have benefited from their care.

I thank all members of our healthcare family, especially the pioneers, who have devoted their lives to making ours healthier and happier.



Lee Hsien Loong
Prime Minister

Minister's Foreword

2015 is a special year for us. We have achieved tremendous progress over the past 50 years because of the hard work of Singaporeans, in particular the blood, sweat and sacrifices of our pioneers who built our nation.

This book chronicles the journey of our healthcare system – from the difficult beginnings in the 1800s when Singapore was under British rule, through our post-independence growth, to the quality healthcare system we have now. Our pioneers laid the foundations for a healthy nation through public and environmental health programmes, built up our healthcare facilities and nurtured our healthcare workforce. We developed innovative policies and came up with our own unique healthcare financing system. We put in place a robust legislative framework to ensure patient safety. We remain vigilant against the scourge of communicable diseases even as we battle the growing chronic disease burden.

This journey would not have been possible without the many healthcare professionals, administrators, planners and policy-makers who have dedicated their lives to caring for the people of Singapore. They displayed ingenuity and resourcefulness in coming up with creative solutions to address the many problems of the time. With good foresight, they planned for our future healthcare needs, ensuring our public healthcare system is not just a high-performing one, but also a cost-effective one. And every day, they have dedicated themselves to saving lives, curing illnesses, and comforting the dying. We owe all of them a debt of gratitude. As we look towards the next 50 years, the Ministry of Health will continue to work hard to improve the accessibility, quality and affordability of healthcare for Singaporeans, while ensuring sustainability. As we all live longer, what is more important is that we live healthily, so that we can enjoy active, happy and fulfilling lives in our golden years.

My wish for Singaporeans is that we nurture the habits of maintaining good health and leading good lives – this is what the Chinese saying 养生之道 means. To lead a good life, we must treasure our health, by practising healthy living in what we eat, drink and do. Together with our families, neighbours and communities, we can create a harmonious and gracious society for all to live in.

I wish all fellow Singaporeans live life fully and healthily, as we begin our journey for the next 50 years, among family and friends, and with peace of mind.

Gan Kim Yong
Minister for Health

MINISTRY OF HEALTH
SINGAPORE

First published in 2015 by MOH Holdings Pte Ltd for the Ministry of Health

Printed in Singapore by
Print Dynamics
PRINT DYNAMICS (S) PTE LTD

ISBN 978-981-09-6201-2

Support for this publication was provided by:

NATIONAL ARCHIVES OF SINGAPORE
An institution of the National Library Board

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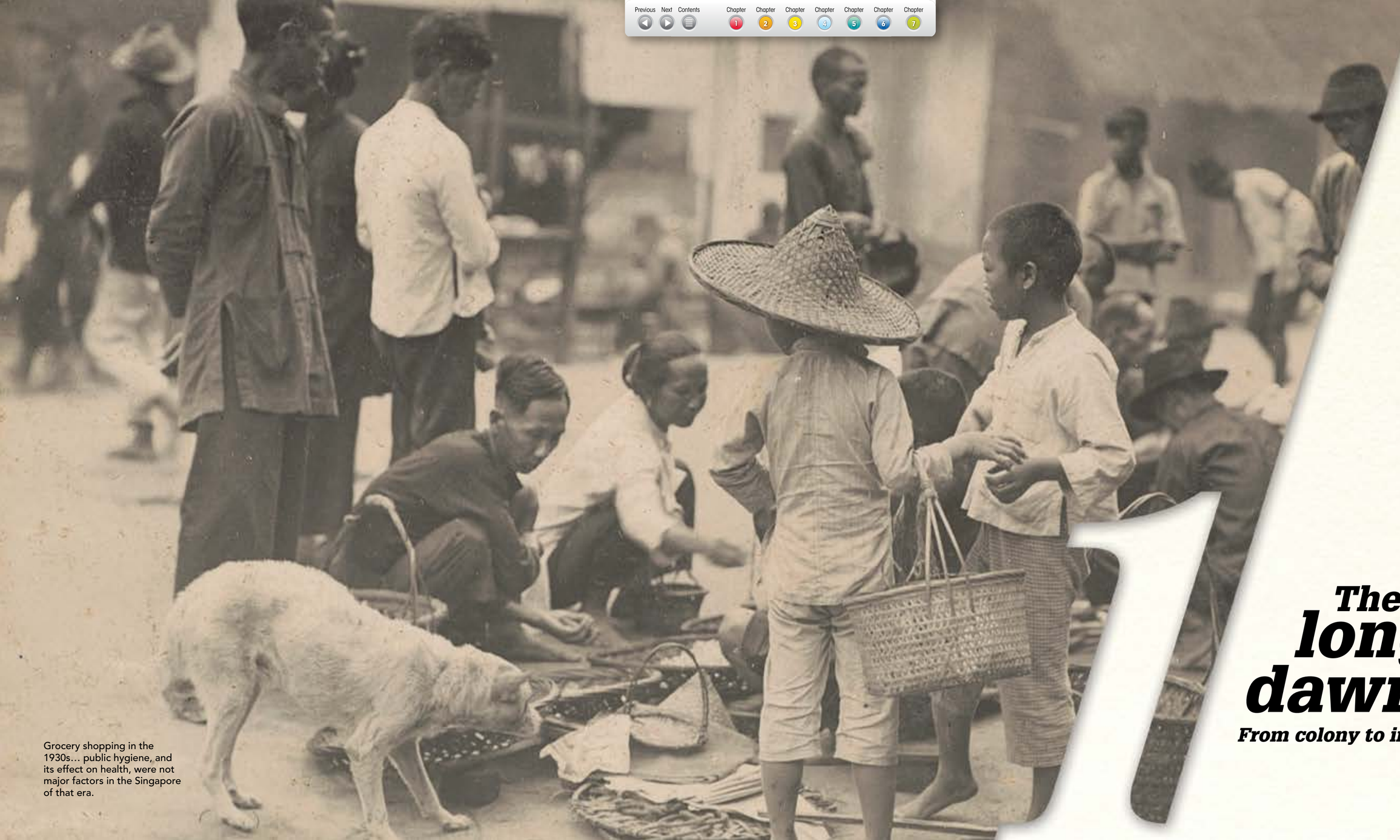
Contents

I will remember that there is art to medicine as well as science, and that warmth, sympathy, and understanding may outweigh the surgeon's knife or the chemist's drug.

Extract from the modern version of the Hippocratic Oath, traditionally taken by new physicians to abide by a set of ethical guidelines in their work. Said to be written by either Hippocrates or one of his disciples in the late fifth century BC, the modern version was written in 1964 by Dr Louis Lasagna, academic dean of the School of Medicine at Tufts University.



Grocery shopping in the 1930s… public hygiene, and its effect on health, were not major factors in the Singapore of that era.

1 The long dawn

From colony to independence

1819 - 1965

◄ Early days… Singapore in the early 1800s was a fishing village with barely 1,000 people.

The birth of modern Singapore as we know it now is inextricably linked to the arrival of Sir Stamford Raffles on 28 January, 1819.

It was not an easy beginning. Singapore then was little more than a fishing village, mostly covered by jungle and a few buildings and a few acres of land under cultivation. It had a population of about 1,000 – about 500 Orang Kallang, 200 Orang Seletar, 150 Orang Gelam and other Orang Laut, 20 to 30 Malays and about the same number of Chinese. But Raffles moved fast. Within days of landing, he had concluded the Singapore Treaty with the local rulers to secure rights for a British trading post in Singapore. By 1824, Singapore and its surrounding islands had been ceded to the British East India Company and subsumed under the rule of the Straits Settlement government, founded in 1786 by Sir Francis Light and based in Penang at that time.

In Raffles' retinue in 1819 was a detachment of European and Indian troops and their accompanying doctor, young sub-assistant surgeon Thomas Prendergast. By most accounts, western medicine is said to have arrived in Singapore in the person of Prendergast, given his responsibility for the health of the expedition.

True to Raffles' vision, Singapore grew rapidly. Western medical care in the early decades of Singapore's founding was administered by doctors in military hospitals for the troops. Local inhabitants and immigrants sought treatment from their traditional doctors and healers. Prendergast, as the military doctor for the troops, was put in charge of the first General Hospital. This was the predecessor of today's Singapore General Hospital (but little more than a shed then) erected near the junction of Bras Basah Road and Stamford Road in 1821.

Medical services were also strictly segregated along economic and social status, a result of prevailing discrimination. The General Hospital was the preserve of European soldiers, sepoys (Indian soldiers) and the colonial government. The medical staff was made up of military doctors, consisting of an assistant surgeon and an assistant apothecary, assisted by a few medical subordinates. Nursing, if it could be called that, was usually the work of convicts, who clanked around the wards in their chains.

Government officials and the European community were luckier. They were treated in their homes by surgeons sent from the General Hospital. If they were very ill, they were treated in the homes of the surgeons. But in the early years, there was no hospital for civilians such as sailors who were not part of the colonial military establishment. Nor was there one for the local inhabitants.

At the time, diseases such as cholera, smallpox, enteric fevers, typhoid and venereal diseases were common. And treatment was rudimentary at best: Hospitals were often dilapidated, had few beds and suffered from chronic shortage of trained staff. Medical officers were posted from India, the seat of the colonial government, and since Singapore was then regarded as a backwater, such postings were dreaded as hardship assignments. Not surprisingly, few came willingly.

Even for the elites, a stay at the General Hospital was fraught with its own dangers. In addition to less than sanitary conditions, a shortage of staff meant convicts were pressed into service as nurses, orderlies and dressers. As one diary entry described it: "The local convicts are invariably in chains, the clanking of the irons about the ward is sometimes severely felt by the weak and seriously indisposed patients."

It was not until 1821 that the local inhabitants and immigrants got their own hospitals, or more accurately, buildings being used as hospitals. And even so, the names of these hospitals reflected the prevailing convention of the day. They were known as hospitals for natives, convicts or paupers, or for the mentally ill, lunatic asylums.

Under these conditions, necessity being the mother of invention, private medical care found a foothold. Records showed that two enterprising European doctors set up their own private hospitals in the 1820s but, as charges were high, only the well-heeled could afford them.

As trade passing through the port continued to grow, so did the number of Europeans, sailors, coolies and immigrants from the surrounding countries. This, in turn, led to growing demand for healthcare. Senior hospital administrators, struggling to cope with demand amidst poor conditions, kept highlighting the deplorable state of healthcare for the growing civilian population to the colonial government. However, the latter, based in faraway Bengal in India repeatedly rejected proposals to build a general hospital for Europeans and sailors.

Ships' captains were especially vocal in their demand for medical services for sick crew members whom they brought ashore for treatment. The captains often rented houses where they could treat their sick crew members, sometimes even leaving them behind when the ships continued on their voyage.

The general hospitals have a colourful history of

▼ Trading places… as trade grew and more ships docked at Singapore, the captains of the vessels started seeking medical treatment for crew members who were unwell or injured.

1821

The first General Hospital was erected near the junction of Bras Basah Road and Stamford Road. It wasn't much more than a shed at that time

1819 - 1965

► Desperate place… poverty, destitution and beggars were common in the early 1900s.

▼ Smoke screen… the use of opium to overcome hardships led to addiction which, in turn, added to the many social ills.

their own. According to the Straits Settlements records, the shed that stood as the first General Hospital in 1821 was replaced by a second in 1822 but the latter "fell down" in February 1827 "on account of the decay of the temporary materials with which it was originally constructed". A directive to build a new hospital "with every regard to economy" was issued. This was apparently obeyed to the letter because the new hospital was in a state of disrepair by 1830, barely two years after it opened. It was described as dilapidated and full of holes, impossible to stay at when it rained and was eventually abandoned.

In 1831, the new Assistant Surgeon, Dr Thomas Oxley, arrived and proposed that a new general hospital for Europeans and locals be built. But it was not until 15 March 1843 that the colonial government, which regarded Singapore as a financial burden and kept a tight lid on its budget, sanctioned the building of the fourth general hospital. Called the Seamen's Hospital, it was built at Pearl's Hill and opened in 1845.

A decade later, a fifth move would take the General Hospital to the Kandang Kerbau district. Its given name, reflecting the patients it served, was the European Seamen's and Police Hospital; it also took in female patients for gynaecological issues from 1865.

An outbreak of cholera in the area in 1873 forced a temporary move to Sepoy Lines. What was intended as a temporary site became its permanent home when the sixth General Hospital was built and opened in 1882. The site at Outram Road was deemed ideal – on a hill and open to the prevailing breezes, with good drainage and water supply, and near town.

Around the mid-1880s, Singapore was also looking to add female nurses to its healthcare workforce. Despite requests as early as in 1856, when the hospitals were beginning to take in female patients, it was only in January 1867 that approval was granted by the colonial administration. Singapore's first female nurse had an onerous workload, working in the lunatic asylum while also attending to patients in the nearby General Hospital. For all this, she was paid 22 rupees a month. (Rupees and Spanish dollars were both legal tender at the time. The rate of exchange was roughly two rupees to a dollar.)

However it would not be until 1 August 1885, the day when nuns from the local French convent began to care for the sick in the General Hospital in Sepoy Lines, that nursing really made its presence felt. For that reason, Singapore celebrates Nurses' Day on 1 August each year and exemplary nurses receive the prestigious President's Award from Singapore's head of state.

Medical services
for natives, convicts and lunatics

The Singapore of the early decades was a desperate place. Graphic descriptions in the Singapore Free Press and the then newly-founded The Straits Times painted a picture of poverty, destitution, beggars on the streets, petty crime and opium addiction, among other social ills.

Immigrants flocked here in search of jobs and a better life. Many of them found themselves penniless and jobless, victims of illness and disease. Many turned to crime to support themselves, and to opium for solace.

In June 1821, the first Pauper Hospital was opened in the cantonment. Funds to operate the hospital were low, as the Governor refused to raise the budget to run the hospital. He felt the Chinese community should help pay for treating their own, especially the poor, since the beggars among them represented a growing social problem.

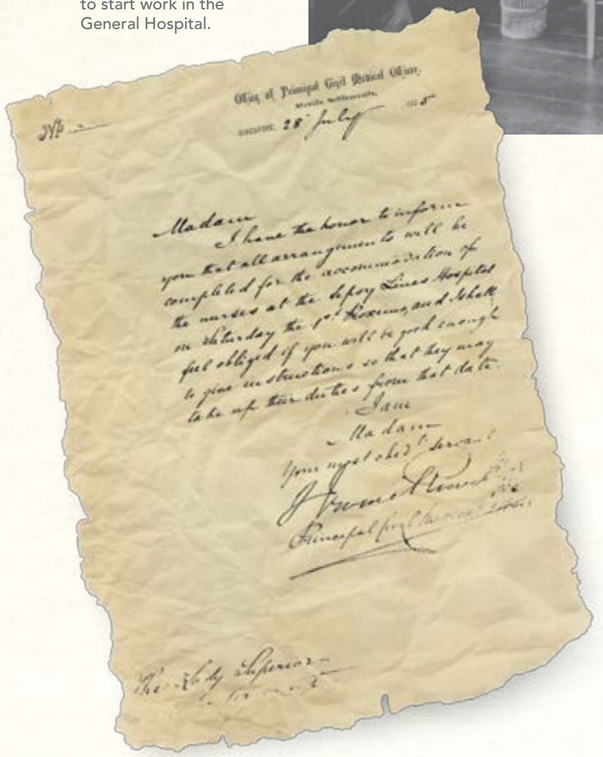
Without contributions forthcoming to keep it running, the hospital was ordered closed. A stay of execution came in the form of the Pork Farm Tax. As the Chinese community was the major consumer of pork, the monopoly of slaughtering pigs and selling pork was auctioned off and revenue from it was used to run the hospital. But the tax was abolished in 1837 on the order of the Governor-General of the Straits Settlements who

1882

After a subsequent succession of moves, the General Hospital found a home at Sepoy Lines, its present location at Outram Road

1819 - 1965

► Nun left behind… in 1885, the Principal Civil Medical Officer wrote a letter (below) to the Lady Superior of the local French Convent, permitting French nuns (right) to start work in the General Hospital.



Office of Principal Civil Medical Officer,
Straits Settlements.
Singapore, 28th July 1885

Madam

I have the honor to inform you that all arrangements will be completed for the accommodation of the nurses at the Asylum Lunatic Hospital on Saturday the 1st proximo, and I shall feel obliged if you will be good enough to give instructions to that they may be prepared to take up their duties from that date.

I am
Madam
Your most obedient servant
James Lowe
Principal Civil Medical Officer

The Lady Superior

was based in India and unfamiliar with the situation on the ground in Singapore. Very soon, the ill and sick, beggars and vagrants began to fill the streets again.

The problem was compounded by increasing arrivals from China due to political upheavals there, as well as sick Chinese labourers from the Dutch colonies who were secretly dumped from their ships at night.

An editorial in the The Straits Times of 23 September 1845 described the situation thus: "It is now more than 25 years since the first formation of the Settlement of Singapore, but still up to this hour no provision is made for the poor, asylum for the sick, no refuge for the destitute. The increase of crime is dilated on, its growing evil lamented but no eye pities, no hand is outstretched to help the poor."

It goes on: "Most of the streets, bridges, passages of the Town and place of public resort are thronged with miserable objects whose diseased

and shattered frames strike horror to the heart… their forlorn situation is no crime… no fund exists from whence their necessities may be relieved and the evil complained of remedied."

The Straits Times also stated that, of the 36,000 Chinese inhabitants in Singapore, about one third had no visible means of support. It quoted police figures to show that nearly 6,000 were close to starvation, with more than 100 succumbing to it each year.

Still the government felt that the Chinese should take care of their own. In 1843, a wealthy Hokkien merchant, land owner, entrepreneur and philanthropist named Tan Tock Sing (modern day usage spells it as "Seng") offered to donate $5,000 to the construction of the new Pauper Hospital. When approached for his views on the matter, he pledged the sum in a historic letter to Lt Colonel Butterworth, CB, then governor of Prince of Wales Island (Penang), Singapore and Malacca. Various sums were also pledged by other Chinese, among them 2,000 Spanish dollars bequeathed by the

I have the honour to be
Sir
Your obedient servant
Singapore 6th Oct 1843
陳篤生

▲ Signed, sealed and delivered… in 1843, wealthy Hokkien merchant Tan Tock Sing (his name was changed to Seng in the 1950s) pledged $5,000 for a hospital to cater to the local Chinese population via a letter (above) bearing his signature and stamp.

wealthy Chan Cheng San (also known as Cham Chan Sang in some records) in his will soon after Tan's donation.

As a result of these efforts, the foundation stone for the Pauper Hospital was laid on 25 July 1844 in Pearl's Hill, just days after the nearby Seamen's Hospital (the fourth General Hospital) got its own foundation stone. As Tan Tock Sing declared, in his letter officially handing over the Pauper Hospital building to the colonial government dated 21 March 1846, it was intended "for the reception and relief of sick, destitute, diseased and decrepit persons of all classes in Singapore who are unable to earn a livelihood or to obtain the means of subsistence except by public begging in the streets". The building was ready in 1847.

It is noteworthy that Tan Tock Sing and his fellow philanthropists did not exclude anyone in need from admission to the Pauper Hospital, which the locals called Tan Tock Sing's Hospital (from the 1950s, it was referred to as Tan Tock Seng Hospital). However, while Tan provided the bulk of the money to build the hospital, a shortage of funds meant it could not operate and paupers were still housed in a rickety shed at the foot of Pearl's Hill until Mother Nature played her part. The shed was destroyed by a violent storm, forcing the move into the Pauper Hospital premises in October 1849.

It is also interesting to note from Tan Tock Sing's letters to the government that the hospital was intended to keep vagrants off the streets, not solely for the sick. The government contributed

1819 - 1965

▲ Mix of people… cultural and language differences among the people in early Singapore made it tough for doctors to do their job.

medicines but not funds and there was no concerted effort to fight the prevalent diseases of the day, such as fevers, dysentery, malaria, smallpox, rheumatism, venereal disease and tuberculosis.

It would take the vision and generosity of other early pioneers like Tan Kim Ching, Tan Teck Guan (the son and grandson of Tan Tock Sing respectively), Tan Jiak Kim (unrelated to Tan Tock Sing), Wee Boon Teck and Loke Yew to use their influence and financial support to build more hospitals for the natives in later years.

While the number of hospitals grew slowly, and their sturdiness to withstand the elements improved, early hospital administrators wrestled with the problem of finding medical expertise and staff. Economy was the watchword of the day. Even the General Hospital, the preserve of the colonial administration, was run on a very tight budget. According to the Straits Settlement records of 1866, it used old bed sheets as bath towels until August that year when permission was given for the purchase of "four dozen bathing towels at a cost not exceeding $20". In the hospitals for the natives, patients were allowed to wear their own clothing but the condition of their clothes was often "in so bad a state from dirt so as to be detrimental to their recovery". Treatment costs had to be raised from 10.5 cents per day to 16 cents in November 1866 to raise money to supply patients with clothing and bedding.

Early Singapore's first doctors faced their share of problems too. Many of them were posted from Britain and India, often military doctors who arrived with their regiments, and they grappled with issues of cultural and language differences.

The doctors found many strange tongues, habits and customs among their patients. Not only did the Chinese speak many different dialects, the Malays, Siamese, Burmese, Bugis, Javanese, Arabs and many more immigrants added to the mix of languages.

However, despite more doctors arriving, the shortage of medical personnel continued due to the increase in population. With growing numbers of people came diseases. Cholera, smallpox and dysentery outbreaks were common, as was tuberculosis. Vagrants, beggars and the sick lined the streets, with no right to seek treatment at the general hospitals and too poor to pay for their native services. This led to growing calls to train locals to ensure adequate medical workers.

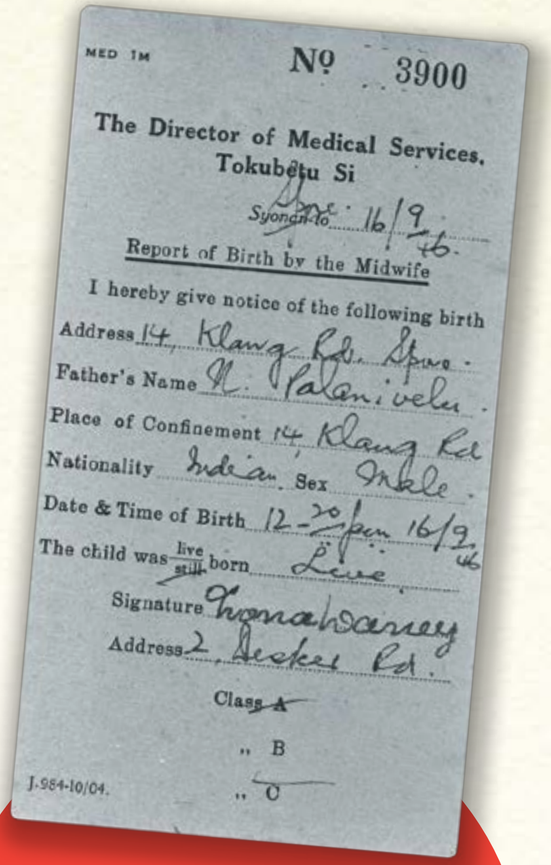
Early medical education in the colonies

Until 1832, the Medical Department for the Straits Settlement was based in Penang, the capital. When the capital moved to Singapore in 1832, the Medical Department followed in 1835.

Medical services were rudimentary at best. Although there was a Senior Surgeon in Penang, he was assisted by medical subordinates, who functioned as military and civil medical officers. Often, the Governor had to order military doctors to attend to patients in civil hospitals.

A 1978 book titled The Medical History of Early Singapore repeatedly mentioned the constant shortage of medical staff. To alleviate the problem, a proposal was put up to train selected local boys as medical assistants, or apothecaries. But the pay was low and the work very demanding.

When the Senior Surgeon in 1822 submitted a plan to the Governor to train selected students from the Penang Free School as apprentices, with a five-year bond, the proposed salary was $6 per month while undergoing tuition. When they were qualified to perform their duties as apprentice apothecaries, they were paid $10 per month. To compound matters, the training was so hard


MED 1M

No 3900

The Director of Medical Services,
Tokubetu Si

Syonan-to 16/9/46

Report of Birth by the Midwife

I hereby give notice of the following birth

Address 14 Klang Rd. Spore.

Father's Name K. Palanivelu.

Place of Confinement 14 Klang Rd

Nationality Indian Sex Male.

Date & Time of Birth 12-20 pm 16/9/46

The child was ~~still~~ live born Live.

Signature Thonahsamy

Address 2 Jecket Rd.

Class ~~A~~

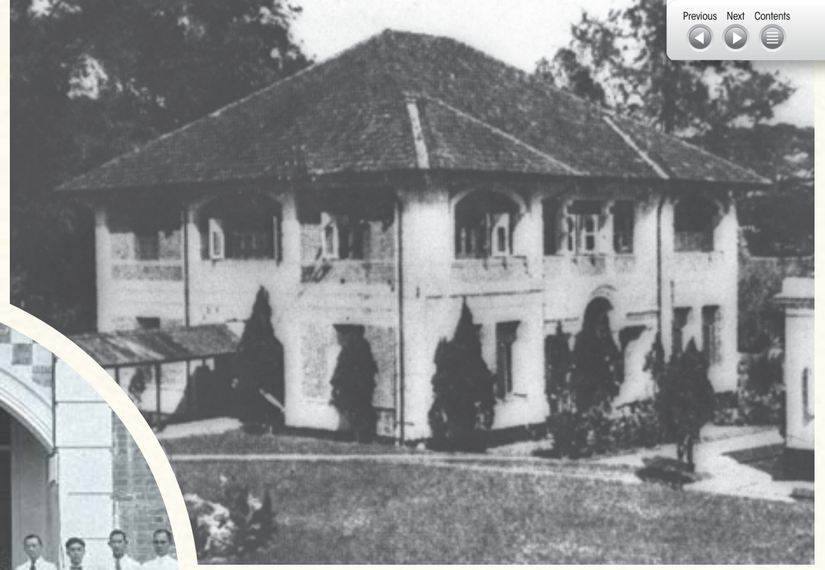
" B

" C

J.984-10/04.

Birth Certificate in the 1940s

A midwife's birth report made to the Director of Medical Services or Tokubetu Si in 1946. It still referred to Singapore as "Syonan-to" despite an official ban by the British Military Administration on the name in October 1945 after the Japanese Occupation ended.



▲ Early clinicians... the medical class of 1925 of the King Edward VII College, posing in front of the Tan Teck Guan Building (above, right) at McAlister Road.

that, of the four original trainees, one dropped out and one ran away. In 1825, the remaining two qualified and received a 50 percent pay rise… to $15 per month!

Not surprisingly, it was hard to get potential trainees to enrol. An excerpt from The Medical History of Early Singapore detailing the duties of an assistant apothecary is self explanatory: "He is placed in charge of the medicines at the Convict Hospital, from which the Native Pauper Hospital, Lunatic Asylum and Jails are also supplied. He has to attend to the Surgeon when he visits the Hospitals, take down notes of any important case, register the prescriptions, see to the medicines compounded, superintend the Dressers, register the names etc. of all the patients who come to hospital, enter their details and draw out returns for them all. Lastly, he must be a person who is able to maintain strict discipline in the hospitals, which is sometimes no easy matter, particularly in the Convict Hospitals."

Nor was medicine then an attractive career path. The treatment of medical officers, as described in the book, was shabby, with "no organised teaching, no promotion prospects, and no provision made for them on retirement. Boys were not keen to join and those in the service were always tempted to leave for better prospects in the private sector".

A good example was the first Chinese candidate to be taken on as a medical apprentice in September 1854 under the assistant surgeon in the Pauper Hospital. He resigned because he could not live on the salary.

Singapore's medical services continued to rely on postings of officers from Britain and India through the 1800s, although a few hardy local young men did apply for training. Various attempts were made through the decades by various officials to raise salaries to entice either local candidates to enrol for training or for officers to accept postings from India, to not much avail.

It was not until 1870 that three local young men were considered fit to be sent to the Madras Medical College for training to become assistant surgeons, with the promise of better pay – a monthly sum of $45 with an increase of $10 every three years until a maximum of $120 was reached. The training carried a 15-year bond. However, only a few – two or three – were sent at any time.

But as trade grew, and with it the economy of Singapore, so did momentum pick up in the building of hospitals – sturdier and with more facilities than their predecessors – and the training of local men to be doctors.

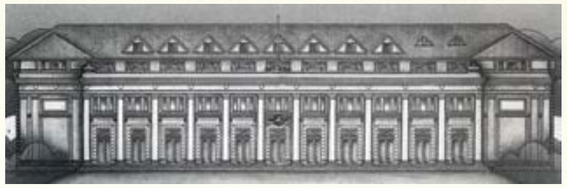
But it would be a long wait, to the turn of the century, before Singapore would have its own medical training facility. Led by leading local merchants and philanthropists such as Tan Jiak Kim (Jiak Kim Street is named after him while the adjacent Kim Seng Road is named after his grandfather Tan Kim Seng), the local community raised the then princely sum of $87,000 for the establishment of a medical school. Following a successful petition to the Governor-General in India, this money was used to convert the Female Lunatic Asylum at Sepoy Lines into classrooms and laboratories.

Thus, on 28 September 1905, the Straits and Federated Malay States Government Medical School, the predecessor of today's Yong Loo Lin School of Medicine in the National University of Singapore, was officially opened. The inaugural intake enrolled 23 students – nine Chinese, six Eurasians, five Tamils and one Malay, one Ceylonese and one European.

Six years later, in 1911, the medical school finally

► Chipping in… local merchants like Tan Jiak Kim (right) raised the then princely sum of $87,000 to set up Singapore's first medical school. In 1905, the Female Lunatic Asylum (above) was converted into classrooms but, in 1911, the medical school had a new home: The Tan Teck Guan Building (facing page, top).

1819 - 1965



► Taking shape… by the time the College of Medicine Building was completed in 1926, it was a faithful rendition of the architect's drawing done in the early 1920s (inset). It housed the medical school's pre-clinical and para-clinical departments, administrative offices, the Medical Library and the Central Auditorium.

▲ Taking care of the men… a male ward with mosquito curtains at Tan Tock Seng Hospital when it moved to Moulmein Road in 1909.

19th century orthopaedic drills

It may look a little scary but this is what orthopaedic surgeons used in the 19th century for drilling and tapping before inserting screws into bones. Later, electric drills replaced these hand-powered drills.

had a new home, the Tan Teck Guan Building. It was built from funds donated by rubber tycoon and philanthropist Tan Chay Yan in memory of his father, Tan Teck Guan, the third son of Tan Tock Seng. The school's name was changed to the King Edward VII Medical School on 18 November 1913, to recognise a large donation from the King Edward VII Memorial Fund. In 1921, it was changed again to the King Edward VII College of Medicine.

Meanwhile, a new college building was planned. On 15 February 1926, the College of Medicine Building at the junction of College Road and MacAlister Road was opened. In the following decades, the College of Medicine Building and Tan Teck Guan Building served as the main tertiary institution of medical education in Singapore. Both buildings are now used as the offices of the Ministry of Health (MOH) and are preserved as national monuments.

Early foundations
of public healthcare

In 1843, approval was given to build the fourth general hospital on Pearl's Hill, a stone's throw from the site of the first Tan Tock Sing's Hospital for paupers. The project was financed by the government and the local community, a growing reflection of the wealth and status of the latter, and opened its doors in 1845. This hospital was even asked to admit mental patients from the European community, even though it was not designed to handle such cases.

In 1860, Pearl's Hill was commandeered for military use by the colonial government. The General Hospital was relocated to the Kandang Kerbau area, its fifth iteration, and was known as the European Seamen's and Police Hospital. It provided treatment for seamen, the police force and female patients (gynaecological complaints and childbirth). Wards were still set up along the lines of gender and economic status rather than treatment for specific diseases. According to the Straits Settlements records of 1864, the site was not ideal, as it was on low ground "near one of the most objectionable creeks" (the present day Rochor and Bukit Timah canals).

An outbreak of cholera in 1873 triggered a temporary move to Sepoy Lines, which eventually became the permanent site for the sixth General Hospital, officially opened in 1882. The hospital would be rebuilt extensively in 1926, and officially opened by then Governor Sir Lawrence Nunns Guillemard.

Meanwhile, the Pauper Hospital at Pearl's Hill had started taking in patients in 1849 to treat widespread dysentery, malaria, tuberculosis and smallpox amongst the growing local population. When Pearl's Hill was commandeered, it too moved to a new site at the junction of Serangoon Road and Balestier Road.

The first maternity hospital was built in 1888 at Victoria Street, the predecessor to today's KK Women's and Children's Hospital.

By the turn of the 20th century, Singapore had become a crown jewel of the British Empire, a bustling trading centre and bastion of its power in the East. Such was its importance that the island merited a visit from King George V and Queen Mary in 1901. By 1904,

▼ Infection control… Middleton Hospital was built in 1907 to treat patients with infectious diseases.

1819 - 1965

► Transformation of a General Hospital…

1821: Singapore's first General Hospital started out as a humble wooden shed near Bras Basah Road and Stamford Road.

1822: The hospital moved away from its original site to one closer to the barracks.

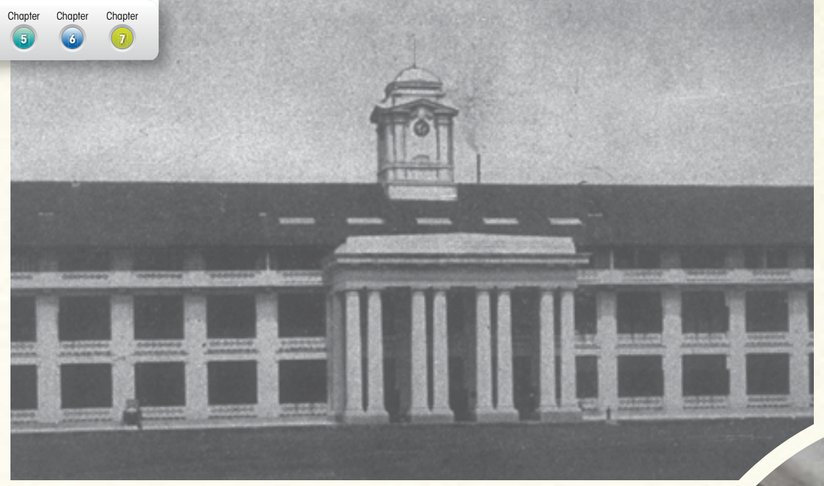
1828: Following the collapse of the hospital building in February 1827, a new General Hospital was constructed. Built on a tight budget, the hospital was already in a state of serious disrepair barely two years after it was opened.

1845: After much delay, plans for a new hospital at Pearl's Hill finally materialised. It was now named the Seamen's Hospital (right, top).

1860: As Pearl's Hill was commandeered for millitary needs, the hospital moved to the Kandang Kerbau district. However, a cholera outbreak in 1873 triggered a temporary move to Sepoy Lines (right, middle).

1882: Sepoy Lines, now known as Outram Road, eventually became the permanent location of the General Hospital which opened this year (right, bottom).

1926: The hospital was rebuilt extensively and officially opened as Singapore General Hospital (facing page, top).



Singapore was the world's seventh busiest port.

But the health of the population in the pre-war years continued to lag behind Singapore's burgeoning growth. The prevailing diseases then – malaria, venereal disease, tuberculosis, beriberi, pneumonia, enteric fever and ankylostomiasis, or hookworm disease – continued to plague the people. Infant mortality was high and patients were still being admitted to hospitals on the basis of their economic status.

The huge disparity in pay for officers in the two medical services – one for Europeans and one for locals – continued to co-exist and cause unhappiness among the local officers. The late Professor Ernest Steven Monteiro, who served as the Director of Middleton Hospital for Infectious Diseases during the Japanese Occupation and later as Dean of the Faculty of Medicine at University of Malaya (1956–1960), spoke about this in May 1985 interview with the Oral History Centre of the National Archives.

He recalled that "an expatriate medical officer would be drawing $850. A local graduate would draw $250. Of course he had annual increments. He was gradually given more salary as the years went by. But the strange thing is that these two services remained apart and caused quite a lot of feelings among the local doctors who all the time thought they were just as good as the expatriates, especially those recruited from England, raw recruits from the Irish universities who had no experience and just dumped into Singapore".

However, despite the public healthcare system still lacking a systematic approach to the development of hospitals and medical services, a nucleus had begun to take shape.

Most of today's public hospitals were built or rebuilt before the Second World War. In 1907, the predecessor to Middleton Hospital was built as a quarantine camp for infectious diseases. It was relocated to Moulmein Road in 1913 as the Government Infectious Disease Hospital and renamed Middleton Hospital in 1920 after Dr W.R.C. Middleton to recognise his 27 years of work in infectious diseases.

The Pauper Hospital was also on the move because the swampy site was deemed unhealthy for patients. Construction at its current site at Moulmein Road began in 1905 and the hospital moved in in 1909.

Kandang Kerbau Hospital moved to Kampong Java Road from its Victoria Street site in 1924. (In 1997, it moved across the road and was renamed KK Women's and Children's Hospital.

▲ Ending discrimination… in the early years, patients were warded according to their economic or social status, not their medical condition. From 1946, the Unit System saw all medical and surgical wards divided into units under the care of their specialists and patients were given equal treatment.

1819 - 1965

▲ Temporary isolation... newcomers to Singapore had to report to the quarantine station on St. John's Island before being allowed to enter the mainland.

Its former site now houses the offices of the Land Transport Authority). The General Hospital at Sepoy Lines was rebuilt and opened on 29 March 1926 as the Singapore General Hospital, its seventh iteration.

A lunatic asylum called the Mental Hospital was built in 1928 to treat and house psychiatric cases; in 1951, it was renamed Woodbridge Hospital. In 1993, it moved from its Yio Chu Kang premises to a new building at Hougang and is now called the Institute of Mental Health. The Royal Air Force Hospital (the predecessor of today's Changi General Hospital) opened in 1935 and the British Military Hospital (the predecessor of today's Alexandra Hospital) was established in 1938.

Middle Road Hospital was set up in 1945 to deal with sexually transmitted diseases and later to also manage skin conditions. Thomson Road Hospital, the last of the pre-independent Singapore hospitals, was built and opened in 1959.

Significantly, it was the opening of the extensively rebuilt Singapore General Hospital in 1926 that marked a watershed in the structuring of Singapore's medical services. The new hospital had few antecedents. It had 800 beds in three blocks, which housed first, second and third class male and female wards, as well as a children's ward. It also had operating theatres, a pathology laboratory, kitchen facilities, an outpatient block and living quarters for nurses.

It broke completely from caring only for seamen and the police to providing modern medical care to the local people, regardless of race or social background. For the first time, the local people, or natives, had access to government-run health facilities.

But the hospital was still far from perfect. Patients were still assigned to wards based on gender and economic status rather than grouped for specific illness or disease; the distance between the three blocks meant doctors were often delayed in attending to their patients. The small number of doctors then made specialisation difficult, although some doctors developed expertise in specific diseases out of interest and the large patient load. The first record of a specialist appointment was of Dr G.A. Finlayson, as government pathologist for all Singapore hospitals in 1906. He also made significant contributions to the teaching of medical students in the Medical School until his retirement in August 1926.

The fight *against disease*

In the 1800s and early 1900s, cholera pandemics were common in Singapore, each lasting many years – one outbreak lasted 24 years, from 1899 to 1923; 2,693 deaths were recorded between 1900 and 1920. Before the 1900s, malaria was uncontrolled and it was not until the 1950s that indigenous malaria disappeared from Singapore. Smallpox outbreaks were common too, as was human plague, brought ashore by rats and fleas from ships calling at the harbour. A death rate of 88 percent from plague was recorded between 1900 and 1930.

Public health measures to fight these diseases were two-pronged – quarantine and vaccination. For example, quarantine facilities were set up at St John's Island for those affected by smallpox and vaccinations and immunisation programmes were carried out for smallpox, cholera, polio and diphtheria.

Progress was made, although these efforts were often hampered by "inadequate facilities, shortage of trained staff and strong opposition from the shipping community", in the words of Professor Goh Kee Tai, Senior Consultant in the Office of the Director of Medical Services, Ministry of Health, and an expert in epidemiology and infectious disease. In his study, he also pointed out that "different quarantine requirements by different countries and utter ignorance of the aetiology and epidemiology of diseases resulted in considerable difficulties, sometimes insurmountable barrier to free transit of goods and people".

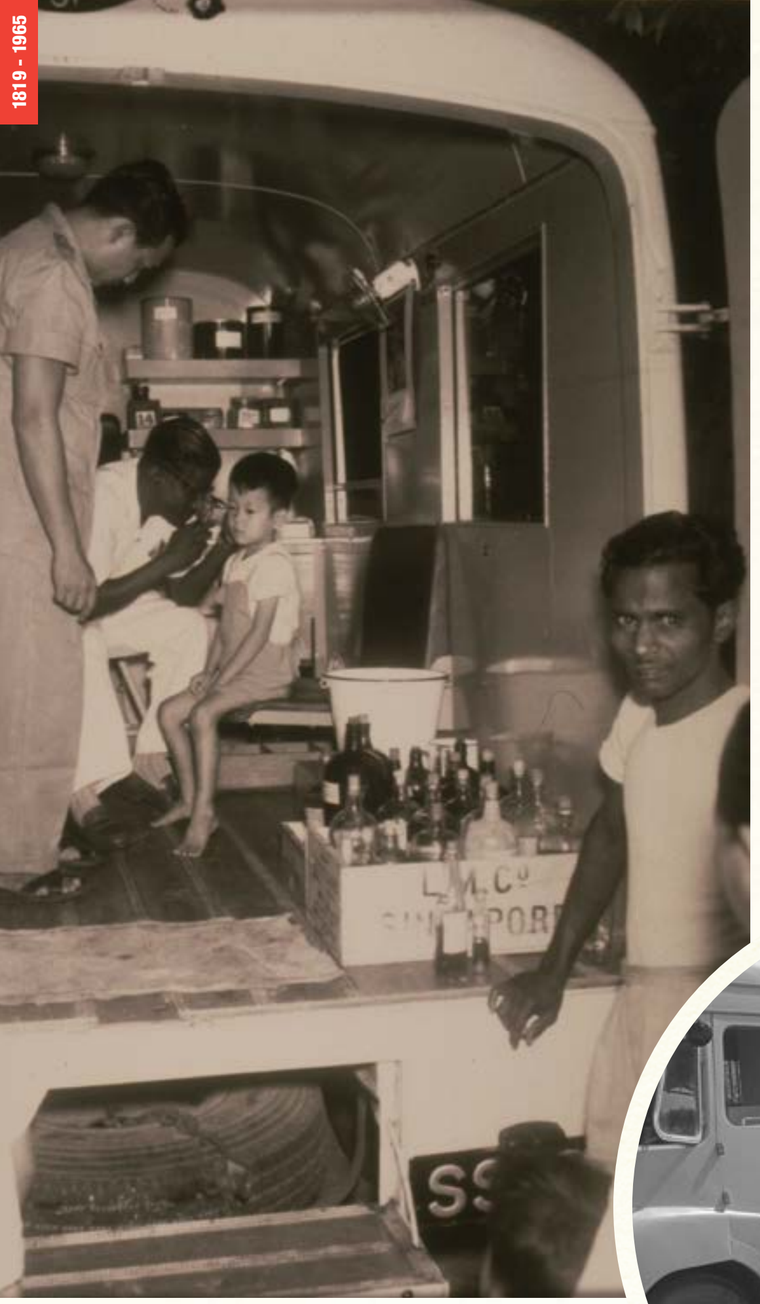
Coupled with the growth in population as trade flourished, Singapore was in need of primary healthcare. Many immigrants who had come to Singapore in the early 1990s had taken up farming in the rural areas to support themselves and their families. The lack of personal or public transport in these areas made it difficult for people to get to the hospitals for treatment, even if they could afford it. Healthcare providers showed doughty ingenuity in providing solutions: Outpatient dispensaries took healthcare to those living in rural areas like Sembawang, Bukit Timah and Choa Chu Kang.

In 1910, the first outpatient dispensary was opened in South Canal Road and expanded slowly to other areas – the next one opened in Paya Lebar in 1923. The creation of the Government Travelling Dispensary in 1930, set up at the urging of Singapore's first public health nurse Miss Ida M.M. Simmons, greatly extended the reach of primary healthcare services to the rural and outlying areas where malnutrition led to postnatal beriberi and common childhood diseases. The service was launched with weekly sessions at the Bukit Timah Government Outpatient Dispensary,

An early stainless steel* proctoscope *used by doctors for rectal examinations

Not the most comfortable topic, but proctoscopy — a common medical procedure to examine the anal cavity, rectum or sigmoid colon for hemorrhoids or rectal polyps — used to be done with stainless steel proctoscopes in the early days. Today, fibre-optic proctoscopes make the procedure less daunting.

1819 - 1965



and other dispensary centres were set up in shophouses and temples all over Singapore.

Simultaneously, attention had also turned to reducing the high rate of infant mortality. As early as 1907, the colonial government began setting up registration and treatment centres from which midwives could be dispatched to deliver babies for mothers who could not afford such services and also to give advice on childcare. This effort to provide better maternal care for local women soon became the Maternal and Child Health (MCH) Service.

The service, run largely by nurses, saw house-to-house visits begin in 1910. By 1923, the first MCH clinic was set up as a vaccination centre in Prinsep Street. As smallpox vaccination was compulsory, parents who took their children to the clinic received advice on childcare while the babies were also weighed and checked for growth issues or abnormalities.

Within the next year, Chinatown, which had a high birth rate, got the Kreta Ayer MCH centre which was set up in the converted Rickshaw Station now known as the Jinriksha Station. In 1931, the Joo Chiat clinic was set up to serve Geylang, which had a higher concentration of Malays.

In the rural areas, there were no permanent clinics. Most villages and roads had no names then, and nurses trudged down footpaths and muddy roads which were often little more than bullock cart tracks – lugging their bags of records and equipment to deliver service, often in people's homes and even by the roadside. Occasionally, they even had to clamber into sampans to reach the outer islands.

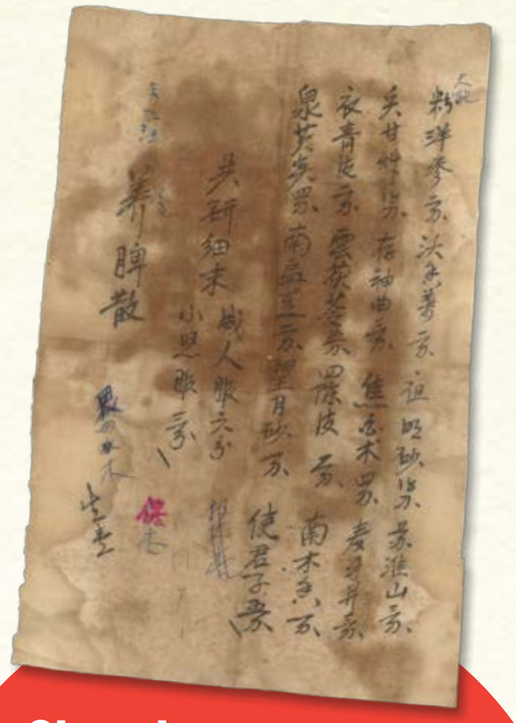
Childbirth and childcare were imbued with taboos, rituals, superstitions and customary practices. The people preferred to consult their bomohs, dukuns, sinsehs or use Indian traditional medicine as they had little faith in Western medicine. The nurses' first job was to build trust before they could dispense medical advice.

The first full-time doctor for the city clinics was hired in the 1930s and the first one for the rural service in 1949. By 1958, there were 13 new clinics for the rural areas. Dr Irene Pakshong, Medical Director of the MCH from 1968 to 1985,

◄ Taking medicine to the people… from the 1930s to the 1960s, the Government Travelling Dispensary scheme saw medical workers travel by boat (facing page) and mini-bus (left, bottom) to treat people living in rural areas.

▲ No patient too far… in the 1960s, public health nurses used to clamber into sampans to offer basic medical care to the villagers who lived on Singapore's islands.

▲ Street-side treatment… it took a while for Western medicine to earn the trust of the people and replace the old-fashioned treatment methods.



Sinseh says…

Traditional Chinese medicine was common in pre-Independence Singapore

No permanent clinics dispensing Western medicine. Superstitions. Customary practices. All these combined to make residents of pre-Independence Singapore resort to bomohs, dukuns, sinsehs and ayurveda practitioners when they fell ill. Sinsehs would write their prescription on any piece of cloth or recycled paper they could find and patients were expected to simmer the herbs issued according to the sinseh's instructions.

remembers working in the Alexandra Road clinic where "there were pigs walking around" the premises.

The Dental Clinic was built in 1938 to provide dental services to the public and government servants.

By the 1940s, medical care in Singapore had undergone a sea change compared to the previous century. The introduction of national health schemes worked in tandem with public health and sanitation measures such as anti-malaria work, sewage and refuse disposal and maintenance of the water supply to improve the health of the population.

Post-war rebuilding

The Second World War, from 1942 to 1945, brought this promising momentum to a screeching halt. The war wreaked havoc on the population and on medical services, severely straining manpower and medical supplies. As a result, the civilian population suffered from severe malnutrition and conditions associated with it, like beriberi, were widespread. Malaria was rampant too.

The Occupation destroyed much of the progress made in the preceding 40 years. The Japanese forces commandeered the hospitals for their use, taking over the General Hospital on 18 February 1942 and turning it into the Occupation's main surgical hospital for its troops in Southeast Asia, along with the Mental Hospital and Alexandra Military Hospital. Kandang Kerbau Hospital and Tan Tock Seng Hospital became the main civilian hospitals. The medical school at the College of Medicine Building was closed on 16 February 1942 and the building occupied by the Japanese Army Medical Corps. A medical school was set up in Malacca.

Many died, from bombs and bullets as well as other consequences of war. A cut in water supply to the General Hospital was disastrous. The hospital buried hundreds of the resulting dead in a mass grave on its grounds. A Japanese air raid killed a group of 11 students who had gathered to dig the grave of a student killed a day earlier at the Tan Tock Seng Hospital dormitory, where he had been on attachment. The bronze plaque commemorating them is still seen in the lobby of the College of Medicine Building today. Postwar, three blocks in the General Hospital were named the Bowyer, Stanley and Norris Blocks to commemorate doctors who died in the war. Only the Bowyer Block still stands as the other two had to eventually make way for hospital expansion.

Once the Japanese left, the British Military Administration faced the enormous yet urgent task of healing the tears in the fabric of Singapore's

► Occupation degradation… the Second World War saw Japanese forces destroy much of the pre-war progress made so far. An air raid left a row of shophouses in Chinatown in ruins (right) while patients and nurses were left shaken after the British Military Hospital suffered similar damage (below).

▲ Metal memory of mettle… this bronze plaque in the lobby of the College of Medicine Building (the current location of the Ministry of Health) honours the 11 students who lost their lives during a Japanese air raid on 14 February 1942 even as they dug a grave for a student who had been killed a day earlier.

► Midwives in the making… happy faces outside the midwifery school at Kandang Kerbau Hospital in the 1960s.

Health Sister's badge

A badge of honour… and reassurance. In the 1950s and early 1960s, nurses – referred to as Health Sisters at the time – travelled to kampongs to provide basic healthcare to the people. This badge, worn by the Health Sisters, gave them a sense of purpose. It also reassured villagers that the Health Sisters were qualified professionals who could be trusted.

public health services. Primary healthcare – outpatient, maternal and child health and the school health service – was given top priority. But it was not enough.

A 10-year Medical Plan to improve Singapore's health and medical services was approved by the Legislative Council in 1948. Implementation began in 1951, with existing hospitals expanded and modernised, while many new outpatient clinics, maternal and child welfare clinics and infant welfare clinics were built. In the meantime, a Nursing Ordinance came into force in 1949 to regulate the registration, training and professional discipline of nurses, while a Medical Registration Ordinance was enacted in 1953, making housemanship compulsory for doctors.

In 1955, the General Hospital's Paediatric Unit was moved to the Mistri Wing, named after the donor Mr N.R. Mistri. In 1956, the new School of Nursing in Sepoy Lines was opened to train more nurses for the expanding medical services.

In 1958, the Institute of Health was founded, housing all the preventive health services for children under one roof. In 1959, the year Singapore attained self government, Thomson Road Hospital (later renamed Toa Payoh Hospital) was converted from treating the chronic sick to dealing with more serious health issues.

Self-governing Singapore inherited the host of public health problems resulting from high population growth, overcrowding, industrialisation, poor food hygiene, vector-borne diseases and poor sanitation. For the first Minister for Health, Mr Ahmad bin Ibrahim, after whom Jalan Ahmad Ibrahim is named, and his successors, these problems persisted well into the 1960s and beyond. On a positive note, the tenure of these able men marked the beginning of reorganisation and consolidation in healthcare services for the fledgling nation.

Tuberculosis, the major cause of death in 1940s, continued to be a problem well into the 1980s. In 1959, a mass X-ray campaign revealed that one in 27 people were likely to have the disease. Quarantine and vaccination programmes continued against smallpox, diphtheria and polio. In 1959, a mass smallpox vaccination exercise covered 1.1 million people over four weeks. Vaccination against diphtheria had been

◄ Special treat… Franciscan nuns and nurses taking tuberculosis patients for a boat ride in the 1950s.

introduced in 1938 and made compulsory in 1962. With poor public sanitation and food hygiene, cholera outbreaks too were frequent and deadly.

New diseases, aided by greater mobility of people and international travel appeared. In 1957, the Asian flu pandemic swamped medical services – of over 160,000 visits to the government and City Council clinics, 77,211 were for flu. There were 680 deaths among a population of 1,445,900.

Infant mortality was high. In 1959, the infant mortality rate was 36 per 1,000 live births (compared to two in 2013). For a small population of 1.6 million then, there were 63,720 live births but 10,246 deaths. Mothers too frequently died during childbirth. Maternal mortality was 0.7 per 1,000 live and stillbirths (compared to 0.1 between 2001 and 2011).

Statistics showed that in 1959, cancer caused 10 percent of deaths, heart and circulatory system diseases 9.6 percent, pneumonia 9.3 percent, diseases of early infancy 9.0 percent, tuberculosis 6.1 percent and stroke 4.7 percent.

Even these dire numbers were an improvement on the past decades. So much so that Health Minister Ahmad Ibrahim could report in May 1960 that "a great deal has been achieved as the responsibility of the health services increase".

He added: "In all, $37.5 million was spent in 1959 for health; about $25 per person. The standards achieved must be maintained. And to do this, we must give better training facilities for more of our citizens in the various branches in health. The last year has shown that it is not only possible to maintain standards, but to continue to improve on them steadily."

And a great deal more needed to be improved.

In a meeting with senior government officials, civil servants, administrators and supervisors connected with the health services, reported in The Straits Times of 14 November 1964, then Prime Minister Lee Kuan Yew painted a stark picture of the state of public health in Singapore. He said: "Singapore is now full of flies. There are many wild dogs and cows running about in the streets, and some of

1 in 27

People in Singapore were likely to have tuberculosis in 1959

"A basket case of urbanisation gone wrong… Overcrowding, traffic congestion, flooding, crime, no proper sanitation – name any urban problem and we had it."

Mr Khoo Teng Chye, who was with the Urban Redevelopment Authority from 1976 to 1996, describing Singapore on the cusp of independence in a 2014 interview with The Business Times

them have been occupying bus shelters as well. The situation looks very grave."

Fifty years on, in a 31 August 2012 interview with the Centre for Liveable Cities (CLC), Mr Lee spelt out Singapore's attributes as a modern first world city: Safety, cleanliness, mobility, spaciousness, connectivity and equity.

But Singapore on the cusp of independence was, in the words of CLC executive director Khoo Teng Chye in a 24 July 2014 interview with The Business Times, "a basket case of urbanisation gone wrong". Mr Khoo, who had served with the Urban Redevelopment Authority (URA) from 1976 to 1996, the last four years as its CEO and chief planner, added: "Overcrowding, traffic congestion, flooding, crime, no proper sanitation – name any urban problem and we had it."

The fight against these challenges would require the coordinated efforts of the Ministry of Health, the Housing and Development Board and the Ministry of the Environment and, later, the URA after independence in 1965.

► Waste management… in the early 1800s, night soil carriers carried human waste in buckets slung across their shoulders (inset) and sold it to market gardens and plantations for use as fertiliser. When the first sewerage system was introduced in 1910, the waste was taken to designated night soil disposal stations across the island before it was channelled to treatment plants. If you are wondering why it is called night soil, it is because the waste was collected mainly at night.

In full knowledge of the obligations I am undertaking, I promise to provide a competent standard of care for the sick, regardless of race, religion and status, sparing no effort to alleviate suffering and promote health and to refrain from any action which might endanger life.

Extract from the Nurse's Pledge, recited by all nurses in Singapore at their graduation ceremony. Drawn up by the Singapore Nursing Board, it lists the principles and ethics of the nursing profession.

HDB takes root... these blocks in Toa Payoh were among the first to rise in the new town, built between 1964 and 1968. Moving people into flats with running water and modern sanitation improved public health significantly as residents left behind the foul-smelling drains, night soil buckets and sewage-holding tanks of their old rural neighbourhoods.

2

Forging new paths

Fighting public health battles; developing specialist care

1965 - 1975

As a fledgling nation, Singapore in the 1960s faced huge challenges. It had no natural resources. It faced threats from the communists while relations with its neighbours were tense. In addition, the largely immigrant population was beset by poverty, unemployment, poor health and low standards of public hygiene. This, in turn, made the people vulnerable to frequent outbreaks of diseases like smallpox, cholera, polio, tuberculosis and malaria.

Prime Minister Lee Kuan Yew was keenly aware that Singapore's path to the future would be a "journey along an unmarked road to an unknown destination". The country was too poor to even dig diversion canals that could prevent the frequent floods which wreaked havoc on public health, commerce and the movement of people. Slum areas in the city had poor sanitation and lacked clean water supply. Wells outside the city, a major source of water for the rural dwellers, were polluted with sources of disease and infection because most people literally lived next to their pigsties and toilets.

Faced with these challenges, the Government quickly defined its priorities. With gritty determination, it worked to tackle the multiple issues facing Singapore.

▲Wet feat… in the 1960s, children braved flooded roads regularly (right) while this policeman (above) rose to the occasion with a little help from a car.

Integrated approach

The Ministry of Health (MOH) was set up in 1959. Mr Ahmad Ibrahim, the first Minister for Health, and his successors knew that better healthcare was not achieved in isolation. Many other issues like housing, sanitation and environmental health had to be addressed in tandem.

Public hygiene began to be tackled with the formation of the Housing Development Board (HDB) in February 1960 to solve the acute housing crisis at that time. Singaporeans then mostly lived in unhygienic slums and crowded squatter settlements. Only nine percent lived in government flats. The HDB built 21,000 flats in less than three years. By 1965, it had built 54,000 flats and "had the housing problem licked" within 10 years of its founding.

Supplying potable water to the residents of Singapore was another challenge given that the waterways in the 1960s were heavily polluted. There were only three water sources – the MacRitchie Reservoir, the Kallang River Reservoir (later renamed the Peirce Reservoir) and the Seletar Reservoir – and these were inadequate to meet the needs of a rapidly growing population.

The Urban Renewal Unit was set up in 1964 as part of the HDB to undertake planning of land use. This included town planning, road planning, transport systems, the port and airport as well as water resources to provide clean, safe water to homes.

The unit evolved to become Urban Redevelopment Department in 1966 and, together with the HDB and the Public Utilities Board (PUB), produced Singapore's first Concept Plan in 1971. This was Singapore's blueprint for building new towns, transport infrastructure and recreational space.

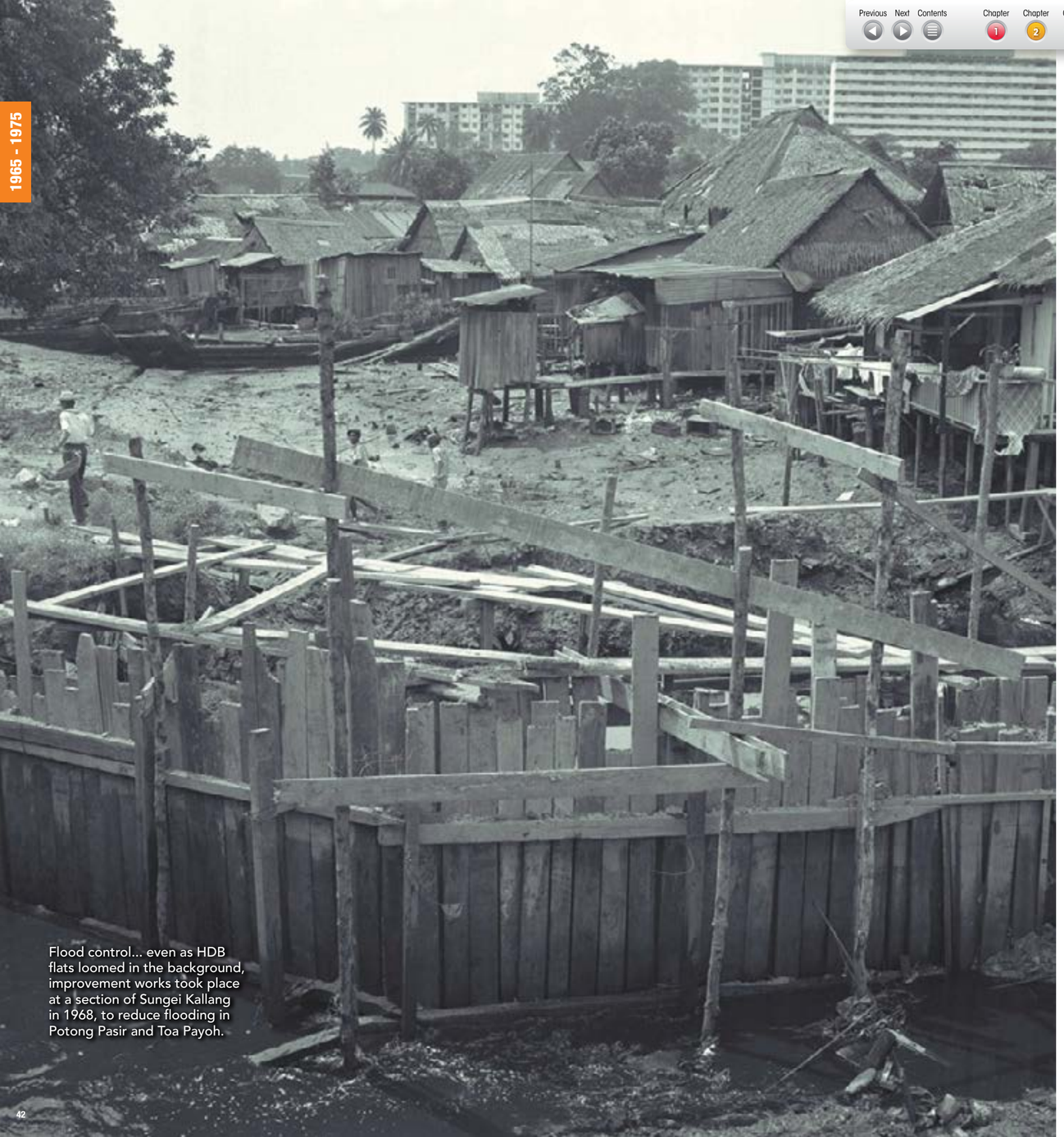
The plan required people and homes to be moved away from the water catchment areas to satellite towns which would be connected by expressways and a mass rapid transit system. It meant relocating hundreds of thousands of residents, as well as industries and businesses.

Public health in the rural areas in the 1970s and even up to the mid-1980s was poor according to Surbana International Consultants deputy chief executive Loh Yan Hui, who was a civil engineer with HDB at the time and had first-hand experience of the situation.

"Many of the houses and huts did not have proper sanitation; the toilets were often of the night soil bucket system while some were connected to sewage-holding tanks which at times overflowed into nearby drains. Foul-smelling drains in such rural settlements were not uncommon. The drains in the rural areas were also usually earth drains which often stagnated, resulting in mosquitoes breeding and houseflies problems," recalled Mr Loh.

Often, the people affected could not see the bigger picture and refused to cooperate. "Some of the squatters would turn nasty and set their dogs on us. We carried umbrellas to defend

▲The way it used to be… houses on stilts in the Kallang Basin during the 1960s. Not everyone was thrilled to be relocated as Singapore was being developed.



Flood control... even as HDB flats loomed in the background, improvement works took place at a section of Sungei Kallang in 1968, to reduce flooding in Potong Pasir and Toa Payoh.

ourselves; at worst we ran for it. Sometimes we even had to get the police to escort us. I believe the resettlement of residents from the rural areas to HDB towns contributed in no small measure to the improvement of public health in Singapore," he added.

Flooding was another chronic problem in the 1960s and 1970s. During the monsoon season, frequent water-logging both disrupted commerce and other elements of daily life like education and transport. It also led to vector-borne diseases like cholera and dengue.

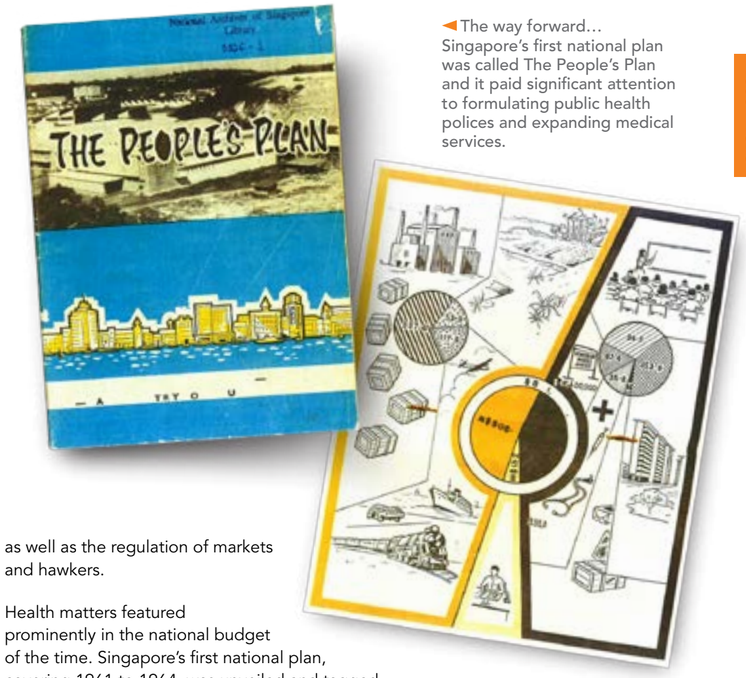
The anti-malaria drainage system, created in the 1920s to deprive the Anopheles mosquito of stagnant water for breeding, helped to deal with the problem. However, it took concerted flood alleviation projects in densely populated but flood-prone areas like Queenstown, Geylang, Bedok, Potong Pasir, Whampoa, Jurong, Tampines and Seletar to eventually get a grip on the problems caused by flooding.

The Ministry of the Environment, set up in 1972, worked with the PUB and the Urban Redevelopment Department to draw up a comprehensive drainage master plan. From 1973, the Government would spend more than $2 billion on new drains and canals, leading to the significant reduction of flood-prone areas from about 3,200 hectares in the 1970s to just 34 hectares in 2014.

Strengthening foundations

Notwithstanding the challenging conditions of the 1960s and early 1970s, these were progressive years for Singapore with steady improvements in the quality of life. Healthcare was a crucial part of this, particularly with the emphasis on ensuring clean public spaces and raising overall health standards.

In 1961, MOH centralised all local medical services under its Public Health Division. This new division was responsible for preventive health services, comprising environmental health (general sanitation, sale of food, drugs, control of infectious diseases and malaria, quarantine and epidemiology), School Health Service (SHS), and Maternal and Child Health Service (MCH). It was also responsible for training and health education, as well as the regulation of markets and hawkers.



◄The way forward… Singapore's first national plan was called The People's Plan and it paid significant attention to formulating public health polices and expanding medical services.

Health matters featured prominently in the national budget of the time. Singapore's first national plan, covering 1961 to 1964, was unveiled and tagged The People's Plan. Balancing bold vision and hope with caution and practicality, it detailed the multi-faceted challenges facing the nation. Priority was given to growing the economy, increasing manufacturing and trade, developing infrastructure, reducing unemployment, managing population growth and improving social services.

Significant funding support was given to public health policies and expanding medical services. In addition, the plan focused on improving nutrition and public health education. It also championed immunisation to continue the unrelenting fight against familiar diseases like cholera, polio, malaria and smallpox as well as emerging "urban" diseases such as cancer and heart disease.

Out of a national budget of $871 million set aside from 1961 to 1964, $35.8 million was earmarked for health services. This was to build more district hospitals and maternity homes as well as expand facilities at the Tan Tock Seng, Singapore General, Middleton and Woodbridge hospitals. Some of the money would also be spent on 17 outpatient

3,200 hectares

That's how much of Singapore was prone to flooding in the 1970s. Today, it is just 34 hectares

Wong Poh Choo, Portering Attendant, Khoo Teck Puat Hospital

"Matron" of the ward

"Matron… matron"… this is how the young interns in hospitals usually address me and it always puts a smile on my face. After all, I am not a full-fledged nurse. I am a portering attendant and I have been working in hospitals for over 30 years.

I started my career in healthcare at Alexandra Hospital (AH) when I was in my mid-30s. Life was hard then as I had two young children – my daughter was only 10 and my son had just been born – and my husband was unemployed, so I had to juggle two jobs to make ends meet. In the morning, I used to wash the laundry for four households while my daughter took care of her baby brother before she went to school. In the afternoon, I would leave my baby with my neighbour before rushing down to AH to work.

In a way, it seems like I am fated to be a "caretaker". When I was just seven, my father told me to stop school so as to look after my mother who went into depression after receiving news of her brother's death. I was the only child and had to grow up faster than the rest of my peers. I had to take care of mum's day-to-day needs as well as clean her when she soiled herself, which was quite a frequent affair as there weren't any diapers back then.

After marriage, I had to look after my children and wash their nappies. And over at AH, I had to clean up patients' bed pans as well as their soiled clothes and bed sheets. All of this had to be done by hand as washing machines were not used then. The worst lot were the blood-stained bed sheets after a massive operation… the smell of blood used to be over-powering and we had to use powerful jets and soak the sheets thoroughly to remove the blood stains.

At that time, a porter had to do everything from cleaning up the wards to patient care such as showering, feeding and transferring them to different locations in the hospital. I can still recall moving a patient to an ambulance on a very rainy night. It was only later that I learnt that the patient had a very infectious disease. That was the nature of the job and thankfully I was fine.

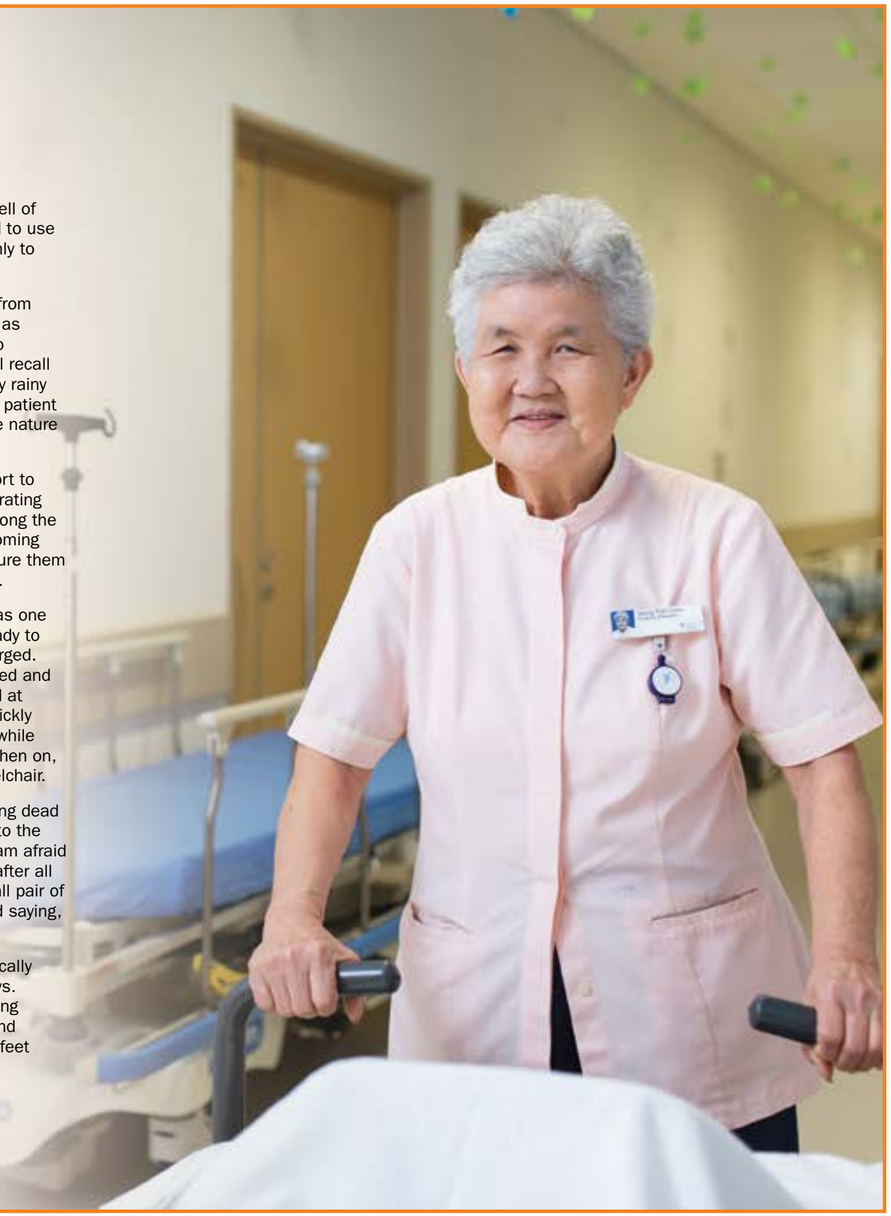
Sometimes, I also provide emotional support to patients when transferring them to the operating theatre. Lying on their backs and moving along the cold corridor with bright overhead lights zooming past can be quite daunting. I usually reassure them that it will be over soon, after a good sleep.

At times, the job can be stressful. There was one incident when I was escorting a pregnant lady to the ground level after she had been discharged. We were in the lift when she suddenly fainted and collapsed onto me. I was really scared, and at the same time worried for her baby, so I quickly grabbed hold of a passerby to hold the lift while I ran to the A&E to get a wheelchair. From then on, I make it a point to ferry patients in a wheelchair.

I also have the unenviable job of transporting dead bodies from operating theatres and wards to the mortuary. People have often asked me if I am afraid of the task, but I guess I am immune to it after all these years. And it helps that I carry a small pair of scissors in my pocket… according to an old saying, it helps to ward off evil.

As you can see, a porter's job can be physically taxing. But things are much better nowadays. And of course the respect you get from young doctors and nurses keeps you motivated and willing to go the extra mile even when your feet are tired.

◄ Friends for life… Madam Wong (second row, hands on a colleague's shoulders) with her Alexandra Hospital colleagues at Ward 7 in the 1990s.



clinics and 22 MCH and SHS clinics. In addition, a further $47.36 million was allocated for sewerage facilities.

The plan was a highly ambitious one given the lack of resources, the extent of poverty in the country and a largely uneducated population. But the Government and successive health ministers – Mr Ahmad bin Ibrahim (1959-1961), Mr Kenneth Michael Byrne (1961-1963), Mr Yong Nyuk Lin (1963-1968) and Mr Chua Sian Chin (1968-1975) – employed a judicious mix of policy and legislation to enforce standards of hygiene and public education.

Educating the public

Around this time, public campaigns became the major thrust in the health education of the multiracial and multilingual population. These campaigns built on the work begun in the 1950s to educate villagers, including campaigns on the correct use of village wells and latrines, immunisation against diphtheria and getting X-rayed for tuberculosis. In fact, public health education was deemed important enough for it to be centralised under the Training, Health Education and Special Assignment section in MOH's Public Health Division.

A variety of methods were used to get messages across. Posters, pamphlets, cartoons and film strips were the primary mode of communication. These were backed up by talks on subjects like nutrition, maternal and infant care, tuberculosis, BCG vaccination (against tuberculosis), diphtheria inoculation and family planning.

Public education went hand-in-hand with the training of public health inspectors, nurses, teachers, medical students and para-medical personnel. Nurses in the MCH clinics did more than just attend to patients. They also helped spread public health messages during their interactions with patients, as did dentists and nurses in the School Dental Service. These methods eventually even moved on to cover newer health issues such as cancer and heart disease.

Keeping things sterile

The quest for a germ-free environment led healthcare workers in the 1960s to devise a sterile storage method for forceps used by nurses to handle needles and pieces of gauze in the operating theatre. Both items, forceps and the tubular containers they were slotted into, were first sterilised in an autoclave, ensuring they stayed clean till used. They were in use until the 1980s. Today, disposable alcohol wipes are used.

"While we are launching free mass X-ray campaigns under the T.B. Control Unit, yet we tolerate the scandalous situation whereby hawkers dealing with food are permitted to hawk without passing the X-ray test."

Health Minister Yong Nyuk Lin in a 1964 article in The Straits Times

Bite of the law

In the mid-1960s, Health Minister Yong had adopted what he called "a total attack of public health problems at one go" approach to tackle Singapore's public health issues. Few issues escaped his attention, as he combined public education with legislation to solve pressing problems of the day.

Having launched the three-month-long Help Keep Our City Clean campaign in January 1964, his aim was as much to encourage cleanliness as to improve health standards.

He formed the 11-man Public Health Advisory Board to help MOH formulate effective and practical measures to maintain high standards in public health. With representatives from different government agencies, it was asked to pay immediate attention to three pressing health problems – hawkers, stray cattle and the collection and disposal of refuse.

Mr Yong told the board that the Hawkers Department "needed a complete overhaul and reorganisation". He was quoted in The Straits Times on 2 June 1964 thus: "While we are launching free mass X-ray campaigns under the T.B. Control Unit, yet we tolerate the scandalous situation whereby hawkers dealing with food are permitted to hawk without passing the X-ray test."

He wanted all hawkers to be licensed, at a nominal fee, and pass the X-ray test to prove they were free of tuberculosis. Hawkers also had to comply with regulations such as not blocking traffic or increasing the hazard of fire. As a result, over 28,000 hawkers were licensed between 1968 and 1969.

The problem of feral and stray cattle was dealt with too. The Cattle Ordnance 1964 mandated that people needed a licence to keep cattle and banned the movement of the animals in built-up areas. The authorities could seize and destroy strays without compensation. The police, he said, had more important duties than to "be amateur cowboys trying to catch straying cattle", especially when the cattle-owners could claim their animals after paying "insignificant fines of $10 to $25". He noted that the cattle nuisance, which had persisted for years, disappeared within six months of the law being enacted.

Mr Yong revamped the refuse collection system too, resulting in a 30 per cent increase in the daily volume collected. Focusing on the regular daily-rated workers, he noticed that they worked one shift and often missed work on Mondays so they could work on Sundays and public holidays to collect double or triple pay. They also spent time collecting tins and bottles for resale.

▼Cattle control… stray cattle was removed from built-up areas from 1 January 1965 under the Cattle Ordnance. Sights such as these cows on the Padang disappeared from that day.

◄Battle unclean practices… public health inspectors using loudspeakers to spread the message about licensing to street vendors on Arab Street in 1963.

28,000

Hawkers were licensed between 1968 and 1969. They had to pass the X-ray test to prove they were free of tuberculosis as well as comply with regulations such as not blocking traffic or increasing the hazard of fire

Catherine Chua Siew Hong, former Assistant Director of Nursing, Institute of Mental Health

The patient who became family

PERHAPS the most daring thing I did in my medical career was to "adopt" one of the patients I was caring for at the rehabilitation ward of the Institute of Mental Health (IMH).

This lady had begun developing a condition called paranoid schizophrenia due to a breakdown in her marriage. And, as her family was in Malacca, I took her under my personal care when she was discharged from the hospital in 1985. My family and I took care of her for 24 years and, in return, she would do small chores around the house.

It certainly wasn't easy as, from time to time, she would do something out of the ordinary. Once when I took her to the market, she suddenly flipped up her skirt. I was shocked, but then I discovered that she had pinned her money to her panty and was trying to take it out to make a purchase. Another time, she left the toilet door open at home while she was peeing. This made me realise that, despite all the work done with such patients during their ward stay to help them to integrate back into society, it is not the same in reality. I had to keep reinforcing these messages at home.

At work, one of my most vivid memories dates back to 1993, when we moved from the old Woodbridge Hospital to the new premises at IMH.

The patients were moved in batches and the last batch was from the forensic ward. Having prepared ourselves for every possibility that could go wrong during the move, we had strapped one patient who was well known among the nurses for being "naughty" to a wheelchair to restrain him from his antics. But, despite his hands and legs being bound, he still found a creative way to touch the nurses... by head-butting their chest. Although it was uncomfortable for the nurses, no one got upset or angry. On the contrary, the nurses were sympathetic to his condition.

Throughout my postings at IMH to the different wards including the acute and forensic wards, the tuberculosis ward was the most challenging. It was tough to take care of the patients in this ward as not only is the disease infectious, some of the patients are intellectually disabled as well. This meant they had to be isolated from the other wards.

It was heartbreaking to look at these patients. Most of them looked frail and were clueless about the disease they had.

Since I joined IMH in 1971, there have been many changes to healthcare. Other than the medical advancements, the nurses' uniform has evolved as well. For one, nurses had to wear a cap secured only by bobby pins back in the early days. It was really inconvenient. I had patients grabbing my cap and sometimes we would be holding onto our caps while running down the ward corridors chasing after a patient!

Although I retired in 2010, I still volunteer at the hospital. I believe in helping those who really need it and I hope to be able to contribute to the community for as long as I can.

As for that patient who came to stay with me, I am happy and proud to say she became part of my family and passed on in 2009 at the age of 64.

◄Younger days... Ms Chua with some classmates at the School of Nursing in 1968 (left) and with President S.R. Nathan in 2000 (right) after receiving the President's Award for Nurses from him.

This led to him forming the 1,500-strong Emergency Cleansing Corps in October 1965 and reorganising the deployment of the daily-rated workers. New ways to reduce handling of refuse on handcarts were devised. Cleaners were not permitted to collect tins and bottles for resale and working on Sundays and public holidays was banned. Not surprisingly, the daily-rated Cleansing Workers Union resisted, resulting in an abortive strike which was called off after three days.

The fight to eliminate mosquito-breeding places, a serious challenge brought on by indiscriminate dumping of rubbish and hawkers' refuse, was also in full swing. Junk shops and their propensity to provide breeding places for mosquitoes did not escape Mr Yong's attention. He pointed out that it was not the duty of the police to "peer into old tins and bottles for mosquito larvae". Forming the Public Health Licensing Board, he tasked it to license the approximately 200 junk shops "whose business of collecting and dumping in the open of old tyres, tins and bottles has proved that after rain… they become water-bearing receptacles, which within a week become heavy breeders of mosquitoes and therefore a great public health menace!".

Two of the more memorable efforts of this time were the anti-spitting and the anti-littering campaigns.

Spitting in public had been frowned upon since 1906, under the Minor Offences Act. By 1926, the fine was $20. This was complemented by education aimed at poor social behaviour and the spread of diseases like tuberculosis. In 1958, a nationwide campaign with posters in Jawi, Chinese, Tamil and English carrying slogans like "Spitting Spreads Disease" was rolled out at schools, cinemas and restaurants. Heavier fines were to come. Today, the fine for spitting or expelling mucus in a public place is $2,000 for a first offence, $4,000 for the second and $10,000 for the third and subsequent offences.

The first massive Keep Singapore Clean campaign was launched in October 1968. This campaign was significant in that it blended persuasion with punishment, an important factor in MOH's ability to gain ground. To establish "better conditions of community living… for a pleasanter, healthier and better life for all", Prime Minister Lee Kuan Yew said at the launch that it would be "one special

$20

The fine for spitting in public in 1926. By 1987, it was an offence to spit and expel mucus from the nose in a public place. Today, the fine is $2,000 for a first offence, $4,000 for the second and $10,000 for the third and subsequent offences

"One special effort at exhortation… then we shall be enforcing the discipline on those who do not respond to social suasion."

Prime Minister Lee Kuan Yew at the launch of the Keep Singapore Clean campaign

effort at exhortation… then we shall be enforcing the discipline on those who do not respond to social suasion". The fines for littering went up to $500.

Over the years, the campaign themes would cover mosquitoes, pollution, water, toilets, littering, street hawking, beaches, factories and homes, all aimed at instilling awareness of the importance of a clean environment.

Discipline came in the form of the Environmental Public Health Act of December 1968. It gave MOH's Public Health Division sweeping powers to enforce standards of hygiene over all fields of environmental health, except air and water pollution. Steering the bill through Parliament, Health Minister Chua described the war on filth as a "relentless one" requiring grit, stamina and persistence to succeed. Offenders now faced fines and even jail terms.

The Act required occupiers of any premises to dispose all refuse within 48 hours, forbade littering and spitting and required hawkers to be immunised against infectious diseases and undergo medical examinations. It also required homeowners to clean, disinfect or whitewash their homes or clean their gardens where these posed a health threat to the neighbourhood. Employers were tasked to provide suitable and sufficient mess rooms, rest rooms, canteens and changing rooms for their staff. Clubs, hotels, associations and other organisations had to enforce stringent checks on swimming pools managed by them too.

Litterbugs could be nabbed by police officers as well as public health auxiliaries empowered by the Act.

Water pollution came into focus in 1971, with the Keep Singapore Pollution Free campaign launched by Prime Minister Lee in October that year. The heavy emphasis on water, said Mr Chua, was because "except perhaps for the oxygen we breathe, it is the most essential commodity for sustaining life itself. Furthermore, water is needed for maintaining cleanliness and hygiene and for keeping our industries going". The campaign also aimed to drive home the point that hygiene was a personal responsibility.

The Clean Air Act was passed the same year to control industrial pollution at a stage when Singapore was industrialising rapidly.

As more Singaporeans moved into flats, they experienced for the first time electricity, flush toilets and potable water on tap. The last night soil bucket was collected in January 1987 thanks to the development of a national underground

►Hands on… Prime Minister Lee Kuan Yew led the way when he launched the Keep Singapore Clean Campaign.

1968

The first massive Keep Singapore Clean campaign was launched. This was followed by Keep Singapore Clean and Mosquito Free in 1969 and Keep Singapore Clean and Pollution Free the following year

▼Line of litterbugs… these men faced littering charges in court in 1973 and were fined between $15 to $65 each.

▲Wait for water… in the 1960s, water rationing in the dry season saw people line up for water (above) while laundry being done at communal taps by people without household tap water supply was a common sight (left).

sewerage system and sewerage treatment plants. Well water and water from communal stand pipes, the main sources of water supply till then, was replaced by piped water into homes. In the city, refuse was removed from houses daily. As the physical infrastructure improved, the Government could turn its attention to tackling social issues, the most urgent being the high birth rate and the strain on resources due to the rapid population growth.

Expanding health services

In 1972, the Ministry of the Environment took over the responsibility of environmental health from MOH. This left the latter free to concentrate on health matters such as hospital services, primary health, dental and support services.

Children's health had got a major boost from 1958 when the Institute of Health in Outram Road became the headquarters for preventive healthcare for children.

A pressing priority was to free up the resources of the general hospitals to deal with acute illnesses. The outpatient facilities at the General and Tan Tock Seng hospitals were closed and all 26 government outpatient dispensaries then were designated for the treatment of minor illnesses. The emergency department of the General Hospital was enlarged and operated round the clock.

The role of the Maternal and Child Health (MCH) also expanded. To tackle the issues of nutrition and immunisation, strategies were targeted literally where new life began – at the mothers. MCH nurses stepped up efforts to wean mothers off feeding their babies with condensed milk which, though cheap, had little nutritional value. Instead, mothers were persuaded to switch to powdered milk. Mothers were also provided information on immunisation to overcome their fears about getting their children immunised against diseases like chickenpox and measles.

Dr Irene Pakshong, who was Medical Director of MCH from 1968 to 1985, described the mindset thus: "At that time, mothers just expected all children to have measles. There were deaths and complications from it. I made out a case to the Ministry to have the measles vaccine and then we had to get the finance department to agree. Eventually we managed to get it but the take up was very poor.

"For the BCG vaccine, mothers knew what tuberculosis was like, so they didn't mind. Things like whooping cough or diphtheria or tetanus... no. Later on, when we would go to schools to check

▼Height of baby care... mothers used to take their babies to the Maternal and Child Health clinics to have them weighed and measured by the nurses.

Harbhajan Singh, part-time Senior Nurse Manager, Tan Tock Seng Hospital

56 years as a nurse

I MAY be one of Singapore's longest serving nurses but the funny thing is, I almost didn't become a nurse.

I was barely 18 and had just completed my O levels in 1959 when I started looking for a job. As my parents were not well-to-do – our family lived in an attap house along College Road near Singapore General Hospital (SGH) – my three siblings and I started working after we finished with school to help support the family.

Jobs were scarce at the time, but the Public Service Commission (PSC) would issue a circular with a list of jobs at the ministries and the different departments. We put a tick against the jobs we wanted in order of preference and the PSC would try and match you to your preferred job.

In my case, the Ministry of Health (MOH) took me on... although my first tick had been for teaching! I was interviewed by an expatriate matron, her name was Miss Griffin (MOH Principal Matron B.M. Griffin), and Miss Lim Kwee Neo (the first president of the Singapore Trained Nurses Association in 1958, which later became the Singapore Nurses Association).

At the School of Nursing – at that time, they called it the Preliminary Training School or PTS – my class of 80 had 15 boys and we had a good time although anatomy and physiology were tough especially since I didn't take a science or biology subject at school. After 3½ years of PTS, I become a registered nurse with the Singapore Nursing Board and started work at SGH. My salary as a student nurse was $152, but my parents were happy that I had a job. In fact, my mother thought that being a nurse was like being a doctor.

At that time, there was quite a marked distinction between male and female nurses. The men would go for the thoracic nursing course or psychiatric training course, and used to work in the A&E department. We were also posted to the Prisons' Department or to St John's Island where the quarantine centre and the Opium Treatment Centre were at the time. The females would go for midwifery. But the men had better chances of getting a promotion and it was only in the 1970s that the Ministry made things more equal for male and female nurses.

In our time, nursing was not a bed of roses. We used to work seven days at a stretch on night duty and then get three days off. By the third night, we would get tired.

As the wards were dormitory style – men in one ward and women in another on a separate floor – we had centre beds which had no call bell and when the patient wanted a bed pan, they would shout for us. If you had patients scheduled for surgery the next day, we had to give them an enema... the old fashioned way, with a tube. Now they just have a suppository.

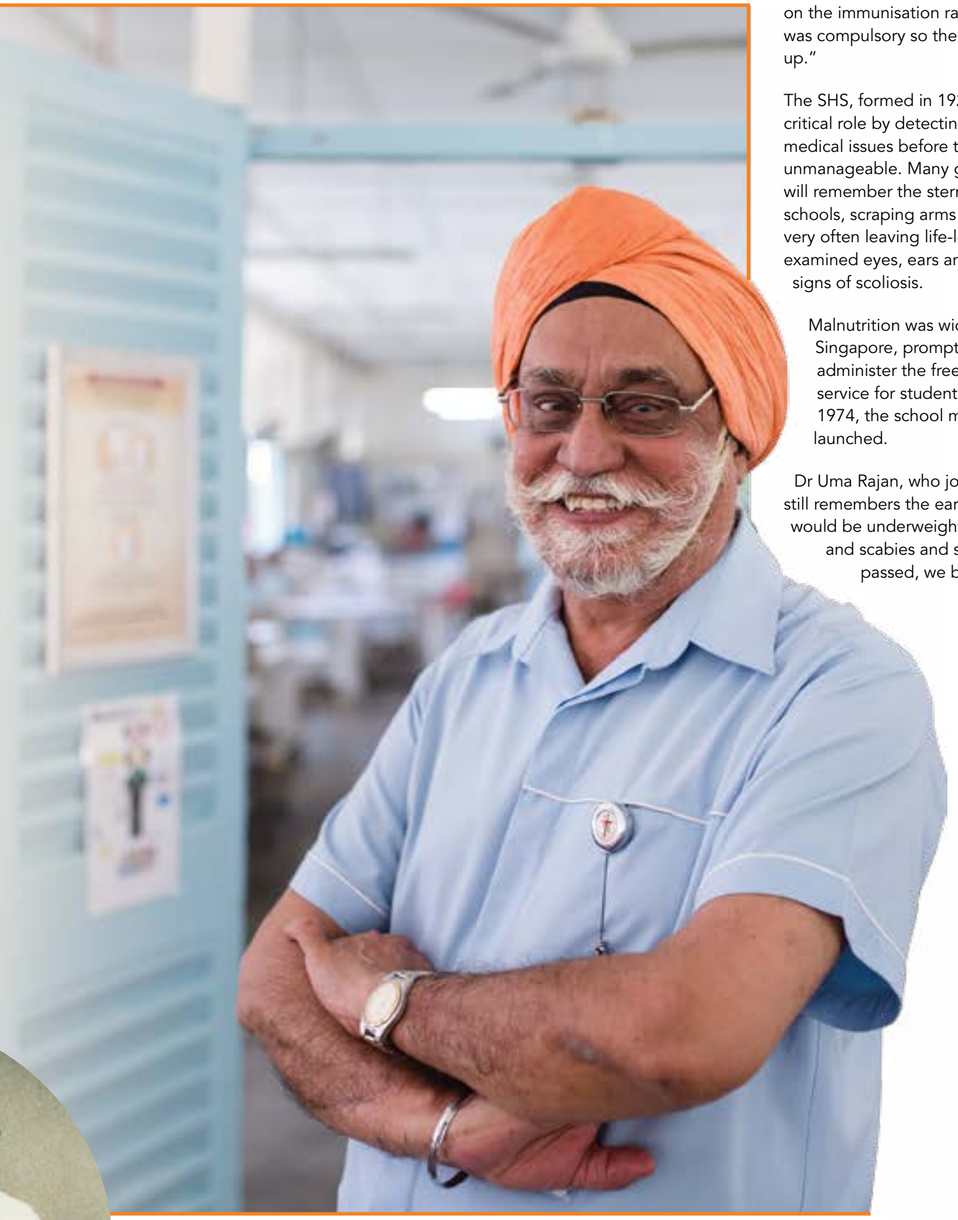
As a junior nurse, one of the challenges was doing the urine routine for every patient. We had to take a urine sample to the treatment room and heat it over a spirit lamp. Sometimes, if the urine got too hot, it spurted onto the wall. By the end of the shift, your whole uniform would smell of urine.

When I came to Tan Tock Seng Hospital (TTSH) in 1965 for the thoracic nursing course, it was primarily a tuberculosis hospital but it was slowly transforming into a general hospital. You name any ward... and I've worked in all of them. Thoracic, orthopaedics, I've even worked in paediatric wards in SGH where I would feed the babies. In a way, that was good, when you get married and have children, you know what to do lah.

I was also a part of the travelling dispensary in the 1960s, where we went to rural areas like Jurong to see patients and give them Panadol or other medicines. When SARS struck in 2003, I was working at the Communicable Diseases Centre as a nurse manager, so I saw that crisis first hand too.

Nursing has evolved from when I started in the profession. Today, nurses are assuming higher responsibilities; in leadership, management, in designing of wards. And the pay is better too. Even though I am officially retired, I still put in some hours of work at TTSH as a part-timer. While I don't go to the wards except to show international visitors around and my work is largely administrative, I still want to serve in any way I can.

► Nursing ambition... in 1959, Mr Singh was 18 and a student nurse (left, with a classmate).



on the immunisation rates, the public thought it was compulsory so the immunisation rates went up."

The SHS, formed in 1921, continued to play a critical role by detecting and managing childhood medical issues before they became intractable or unmanageable. Many generations of Singaporeans will remember the stern nurses who came to their schools, scraping arms for BCG vaccinations and very often leaving life-long scars. The nurses also examined eyes, ears and measured spines for signs of scoliosis.

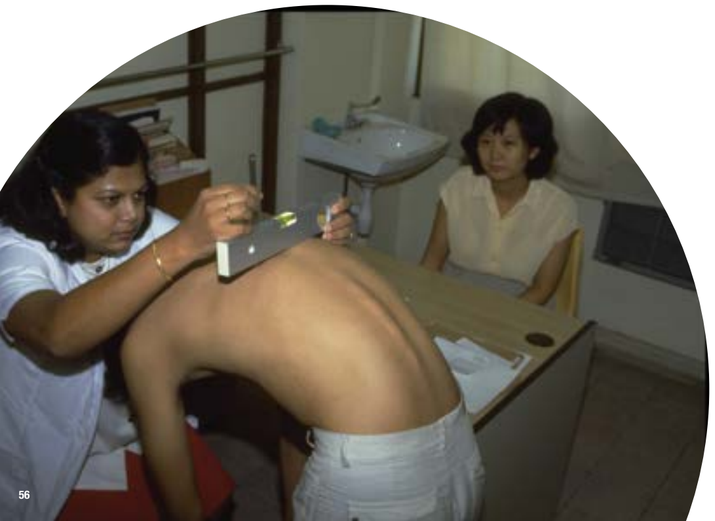
Malnutrition was widespread in post-war Singapore, prompting the service to administer the free and subsidised meal service for students in the 1950s. In February 1974, the school milk programme was launched.

Dr Uma Rajan, who joined the SHS in 1972, still remembers the early years. "The children would be underweight, had a lot of head lice and scabies and scoliosis. But as the years passed, we began to see new things

Baby weighing equipment

Wicker baskets were what babies were placed in to weigh them in the 1950s and 1960s. Other materials used for the weighing pans ranged from sack cloth to metal plates, a far cry from the digital machines topped with plastic trays used today.

▲Looking after the children… nutrition was enhanced in schools when students got cups of skimmed milk (above) during recess and food rations to take home; they were also regularly examined by nurses and given vaccinations, medication (above right) and back examinations (below, the Forward Bending Test used to screen for abnormal curvature of the backbone).



such as myopia, obesity, mental issues and even eating disorders," she recalled.

Abysmal oral hygiene meant widespread tooth decay too in post-war Singapore. MOH adopted a multi-pronged strategy to tackle the problem. Among the moves were fluoridating the water supply from 1958, building more dental clinics and increasing dental health education.

The strategy that had long-term impact tackled the problem at its root, in childhood. Sterling work by the School Dental Service ensured that children kept their teeth into adulthood. This was no small task, given that half of the schoolchildren did not even own a toothbrush.

In the 1950s, the only dental clinic was in Tan Tock Seng Hospital, which meant ferrying large numbers of students there by bus. This logistical load combined with the growing crush of patients required a more practical and effective approach. This gave rise to the mobile dental vans in 1955. They were equipped with power generators to ensure they could service outlying areas. The

Government also announced in November 1961 that all future schools would be equipped with their own dental clinics.

The pivotal change would come with the compulsory toothbrushing programme in February 1969. It ensured all Primary 1 to 3 students brushed their teeth after recess time. The children were also taught proper toothbrushing and dental care techniques by their teachers, some 2,680 of whom had been trained by the Dental Health Education Unit and supplied with visual aids to better explain to the children.

In all, more than 367,735 children from all 439 schools were covered by the campaign between 1969 and 1970. Each child could buy a plastic mug and a toothbrush for 25 cents. Some 1.5

▲This is the way we brush our teeth… kindergarten students happily brushing their teeth in 1973, a stark contrast to when the toothbrushing programme was launched in the late 1960s when many of the children were reluctant, shed tears and threw tantrums.

Dr Irene Pakshong, former Medical Director of the Maternal and Child Health Service

Champion of immunisation

I CAME to Singapore in 1963 with my husband from Penang when he got a job with what was called the Harbour Board then. Although I was interested in clinical medicine, I applied to join the Maternal and Child Health Service (MCH). I felt I needed to have a day job.

When you join, you become the relief doctor. I was sent to all the different clinics; Tuas, Changi, Punggol and they were really ulu (remote) in those days. I was posted to the Southern Islands team based on Pulau Brani. We used to go to Pulau Sudong and Semakau too. There were mostly Malays living there, and that's where the Malay classes I attended in Penang came in handy. I was able to speak Malay better than I was able to speak Hokkien.

The clinics were very primitive in those days. The nurses did the dispensing and sharpened needles for immunisations and autoclaved them in the clinics. When I went to Tuas MCH, I saw a bucket system the doctors used as the toilet.

Around 1966, I applied for no-pay leave to do my Diploma in Public Health in Singapore. I was getting a bit fed up with the coughs, colds and things like that we handled in the infant clinics. When I came back, I was immediately hauled into administration by Dr Maggie Lim, who headed MCH then. Dr Connie Lim took over a few years later and, when she retired, I was made acting head of MCH. At the time, my position at the ministry was Senior Health Officer, Grade G. In those days, you had to apply for promotions. I didn't want the job as I didn't want to be in an administration job but they kept me as the acting head for a long time. So the next time the promotions came around, I applied for the job which I had until I retired in 1985.

There were over 55 MCH clinics, including the city and rural ones, as well as the visiting centres and the kampong midwife centres. In those days, our midwives did home deliveries. They conducted ante-natal clinics in the morning and visited homes in the afternoons. When required, they did deliveries.

Gradually, when most of the deliveries took place in the government hospitals, our midwives would do what they call 'domiciliary aftercare'. They would visit the mothers, wash the babies and look after the umbilical cord until it dropped off. If there was anything wrong, they would send the mother and child to see the doctor in the clinics. I said to them, you must teach the mothers to wash the babies themselves and look after the umbilical cord.

We did more preventive work. We started doing pap smears and teaching breast self-examination. This is what the doctors did but later we trained the nurses so more patients could be taught. We started doing developmental assessment of children and we started Well Baby clinics.

We had an immunisation programme, but it didn't cover measles which was very prevalent those days and there were deaths and complications from it. Eventually we managed to get the ministry to include it. However, the take up was very poor as it was not compulsory. Mothers didn't mind the BCG as they knew what tuberculosis was like but things like polio, whooping cough or diphtheria or tetanus, no. It was tough convincing them to complete the whole course. Eventually, when we got the schools to check on the immunisations rates, the public thought it was compulsory, so the immunisation rates went up. We also introduced rubella for the women later.

I used to attend meetings with the World Health Organisation in the 1970s. When I told them about our immunisations rates – it was over 90 percent – they would ask "are these numbers real?".

Our numbers were very good for a developing country. The immunisations were always given by nurses. Even now, at polyclinics, it is the nurses who do it better as they do it constantly.

Health education is something I really believed in. After I did the Diploma, I was always thinking of how to improve things, which is how the health booklet came about. My idea was that it eventually could pass on to school health and to the army. It took time and eventually the private sector picked it up. I have my granddaughter's health book as a keepsake. In those days it was so difficult to even get a brochure out. Now there are massive campaigns that reach out to the entire community.

◄ International cooperation... Dr Pakshong with fellow participants at the World Bank Population and Development Course in December 1979.

million sets were sold. In 1973, the campaign was extended to all kindergartens.

In the meantime, nursing too had undergone major changes in Singapore. By the 1960s, it was a far cry from when convicts were forced to work as nurses in the 1800s and from the day in January 1867 when its first female nurse was hired to work in the lunatic asylum and concurrently serve patients in the General Hospital.

Nurses were now coming to the forefront in the delivery of primary healthcare services, with varied roles. They were crucial players in maternal and child health services, school health screening, vaccination campaigns and school dental health programmes. Of course, they also played a vital role in hospitals and clinics.

▲ Man for the moment... Prime Minister Lee Kuan Yew with the nurses who went on strike in 1963.

In fact, proof of nursing's value to patient care became apparent when nurses went on a six-day strike from 8 June 1963 over an issue of union representation. It affected operations at the General, Kandang Kerbau, Tan Tock Seng and Woodbridge hospitals to the extent that patients whose conditions were not considered serious were asked to return home. Health Minister Yong, reviewing the impact of the strike, said in a 1968 New Year message that the strike "shocked the public and shook the morale of the whole service".

The profession had an old-fashioned air of adventure about it too in those days. Many are the colourful stories of doughty, determined nurses who boarded sampans to travel to the outer islands like St John's Island, Pulau Tekong

► Floating platform… the family planning message was loud and clear on one of the floats that went down Maxwell Road during the National Day celebrations in 1975.

Pouches to couch family planning message

Much was done to spread the family planning message from the late 1960s. Among the methods used was this coin pouch (with a message on one side and a small pad and pencil inserted into the other side) which was given to mothers.

and Pulau Ubin. They then trekked down rutted mud paths to villages where they dispensed medication, gave injections, delivered babies, measured growing toddlers and generally took on the role of medical adviser, especially in the area of family planning. In a sense, theirs was community- and home-based care at its pioneer best.

Family planning

Perhaps Mr Yong's contribution is most memorable in population planning and control.

In its first decade as a nation, Singapore was experiencing rapid population growth, raising concerns over social problems like housing and food shortages. Quite a few impoverished families were unable to support their large numbers of children.

Family planning then was still deemed a personal rather than a national concern. The main work in this area was done by the Singapore Family Planning Association (SFPA), set up in 1949 by a group of concerned volunteers. They did their best to spread the family planning message through nurses in the Infant Welfare Clinics in the rural and urban areas. Funding for these efforts came from small government grants (capped at $100,000), donations and nominal clinical fees.

In 1960, the first highly successful three-month-long Family Planning Campaign kicked off, with an exhibition at Victoria Memorial Hall in October and travelled to the community centres afterwards. The exhibition was spearheaded by Dr Maggie Lim, a great-great-granddaughter of Tan Tock Seng, and a trailblazer in family planning and birth control.

Having joined the SFPA in 1949, she was instrumental in setting up a network of maternal and child clinics in the 1950s and became the head of the MCH service in 1963. As a doctor, she saw 40 to 60 babies and their mothers each day and witnessed the effect of malnutrition on poor families with many children. Dr Lim's prominent role in family planning even earned her the accusation, as she told the 1964 SFPA annual general meeting, of "corrupting the young and scheming to depopulate the earth".

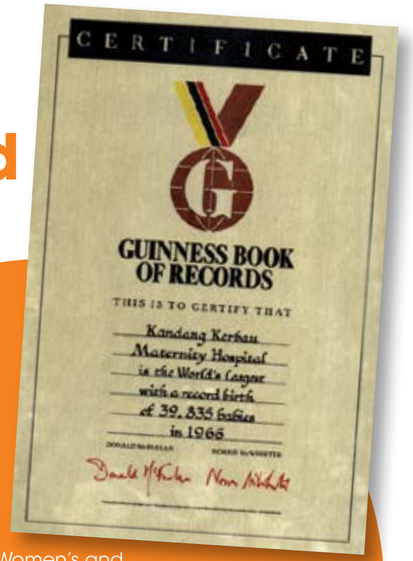
Her stance was backed up by the 1965 White Paper on family planning which called it "a tragic situation whereby the large majority of our poor workers who earn the least take-home pay are instead having very large families, with mothers bearing no less than 8, 10 or even 12 children". Plus there was the issue of unwanted children and the health of mothers who underwent multiple pregnancies.

In the five-year plan laid out in the White Paper, MOH assumed responsibility for family planning and took over the work of the SFPA. It formed the Singapore Family Planning and Population Board (SFPPB) in January 1966 with Dr Lim as its first president. The board was expected to take over 90 percent of the work of the SFPA and manage the issue on a national scale.

The plan aimed to provide women of childbearing age (15 to 44 years) with family planning advice and contraceptives. The main push was for the use of an intrauterine contraceptive device, with the contraceptive pill as an alternative. Family planning clinics were set up and the 44 MCH clinics were pressed into service, providing a range of services such as inserting intrauterine devices and dispensing contraceptive pills, condoms and advice. A Mobile Clinic Service conducted home visits and spread the word on family planning.

The men were not forgotten. A Family Planning Clinic for Men/Vasectomy Clinic was set up in the National Family Planning Centre in Dunearn Road in June 1972. A month later, the Family Planning Campaign was launched, leading to a marked increase in the number of vasectomies (surgical procedure for male sterilisation) performed.

Kandang Kerbau Maternity Hospital sets a world record



39,835 babies in 1966! That was a world record acknowledged by the Guinness Book of Records… and Kandang Kerbau Maternity Hospital (now known as KK Women's and Children's Hospital or KKH) held it for 10 years. Ms Lee Suk Ting, a former nursing officer at KKH, recalled: "The number of deliveries in KKH was at its peak, with an average of 100 deliveries per day. The number of beds available then fell far short of demand, and many deliveries were conducted with patients lying on the floor on mackintoshes or on transport trolleys. Patients in the early stages of labour sat for long hours on hard wooden benches waiting for a bed."

Communications efforts covered every possible front. Television, radio and newspaper advertisements were supplemented with advertisements on bus panels and in cinemas. In addition, the team running the campaign also held exhibitions, talked to newly-weds, schoolchildren, workers and even harnessed the unions and grassroots organisations to spread the message.

Wong Ngiap Leng, Ah Leng's canteen

Counsellor, banker, provider of food and drink...

THE funny part about Ah Leng's Canteen is that it wasn't a name picked by my father, who started the canteen in the 1920s, or me. At that time, the hospital was called Sepoy Lines by the British and my father just ran the canteen... and it never had a name. Ah Leng's Canteen was just the way all the medical students of that time referred to it and I guess it just stuck. And, in a way, it is apt since I was born there!

I took over the canteen in 1947 when my father went back to China – he had to shut it during the war (World War II). I was 19 years old and had just got married, so my wife helped me at the canteen.

Many of our customers were students who returned to medical school after the war. At the time, there was no Singapore or Malaysia, so there was no difference. It was just hostelites at King Edward VII College of Medicine and non-hostelites. And because we lived on the premises, we opened the canteen at 6am and closed only around 7pm. At that time, we served toast with half-boiled eggs, coffee, tea, Milo, Horlicks, curry puffs and ham and cheese sandwiches. One piece of toast at the time cost 10 cents.

Later, we started serving kway teow, chicken rice, bee hoon and eventually even hamburgers for lunch and dinner. I remember Dr Mahathir (former Malaysian Prime Minister Tun Dr Mahathir Mohamad, Class of 1947) liked my bee hoon soup.

After I closed my canteen at 7pm, I ran a small stall on the roof of KE Hall, serving snacks and hot drinks to the hostelites until midnight. Then I would go home. It was like that seven days a week.

I don't know why the students liked my canteen. It was a cosy corner where they all sat and chatted. But I can still recall the smell of the chemicals wafting into the canteen from the anatomy department (now a carpark near Harrower Hall). Or was it the smell of the dead bodies? I was not sure.

Some of the students were hiding from lecturers, others were waiting for boyfriends or girlfriends. I don't want to say who they are but most of them are successful doctors now. And because we were near the sports field, students would pop in after playing football, cricket or hockey. There were a few fights after the games, but not at my canteen.

My wife and I lived at the back of the canteen with our four children until we bought our flat at Tiong Poh Road in 1966. We could walk across the road from the canteen. There was no expressway (AYE) then and we walked through the field using a torch because it was so dark.

It is true some of the students borrowed money from me to pay their fees or for food. Some of them also gambled. I kept records of what people owed me in the tiga lima buku (555 books). Most of them paid me back once they started working. Some forgot, but it is okay. The names are still in some of the 555 books which are in a locked box. I won't let anyone see them.

I collect all the newspaper articles about the canteen. I also received a copy of a special book (the Centenary of Tertiary Education by the Medical Alumni) where the doctors printed my name on the cover. Dr Ngiam Tong Lan also wrote a poem about me. In 2005, Professor Tan Ser Kiat asked me to make tea at the opening of Duke-NUS Graduate Medical School at the Singapore General Hospital (SGH) grounds. I was so happy to go back to SGH to make the same tea I made for all of them when they were students.

I am 86 years old now. I still remember everything; I remember everyone. They are always in my head and in my heart.

◄ Ah Leng and his wife at their canteen for the last time before it was shut down on 2 June 1983.

A key measure was abortion. Mr Yong aroused controversy when he announced the intention to legalise abortion on 5 September 1967, calling it "the ultimate weapon" to curb the birth rate and Singapore's "second line of defence against hordes of unwanted children". He said abortion would complete the "full range of family planning methods".

Induced abortion and voluntary sterilisation was legalised in 1969. Both acts were later replaced by the Abortion Act 1974 and Sterilisation Act 1974 which further liberalised abortion and sterilisation.

In the first year of the plan, 30,410 women registered for family planning, 22.5 times the number in 1965. The number continued to top the 30,000 mark through 1969. By 1971, 70 percent of all married women of child-bearing age had accepted family planning options. The crude birth rate fell sharply, from 28.3 live births per 1,000 in 1966 to 22.1 in 1970.

The second five-year plan for family planning aimed to consolidate the rapid gains of the first. The emphasis had shifted though, from the heavy focus on birth control to family planning and encouraging the ideal of the two-child family, regardless of gender.

In 1972, the Stop At Two campaign was rolled out. Health Minister Chua had introduced the theme Plan Wisely for a Small, Healthy and Happy Family at the launch of the campaign. He said the target crude birth rate was 18 per 1,000 by 1975 and disincentives would be introduced to nudge couples into having smaller families. These disincentives, introduced progressively, included no-pay maternity leave after the second child, income tax relief up to the third child only and higher

22.1

Singapore's crude birth rate (live births per 1,000 of the population) in 1970. It was over 30 in 1965 and the big drop sparked concerns about the long-term effects of the family planning efforts

Family planning in a book

The end of the Second World War sparked a baby boom in Singapore. That led to the Singapore Family Planning & Population Board producing this booklet in the 1970s which had space for telephone numbers and addresses… as well as family planning messages and diagrams of various contraceptive methods.

accouchement fees for the fourth and subsequent children. These measures were backed up with yet more disincentives like lower priority admission to schools for the fourth child and beyond and no permission for families with more than three children to sublet their HDB flats.

While the earlier decade's campaign zoomed in on having fewer children, this decade's version had a specific goal. It asked parents to Stop At Two. The messages crafted dealt with various aspects of the two-child family. Thus, variations on the Stop At Two theme included "Happiness is a two child family", "one two…and that's ideal" and "Plan a two child family".

Complementary themes emphasised the advantages of a small family, such as they have "more to spend", "more to eat", "have a better education", "enjoy better health" and even "own more". Yet others dealt with delaying marriage or childbirth, such as "Teenage marriage means rushing into problems" or "A happy marriage is worth waiting for".

By 1975, the target crude birth had been reached. However, the drop to 17.7 saw concerned academics and lawmakers expressing twin worries about the fertility rate dropping below replacement and the impact of an ageing population by 2030.

Whilst the alarm bells were beginning to ring, efforts to stem the slide would still lie some years in the future.

Paradigm shifts in medical education

The 3½-year Japanese Occupation had brought medical education practically to a standstill in Singapore. Ironically, it sparked a paradigm shift in the thinking of the local medical community that would help shape the future of medical training here.

Dr Chew Chin Hin, Past Master of the Academy of Medicine, gave an insightful account of this when he delivered the 18th Gordon Arthur Ransome Oration on 19 July 2007. With the expatriate doctors interned by the Japanese during the war, local doctors and staff had assumed full responsibility in running the Tan Tock Seng and Kandang Kerbau hospitals, the two that were left to serve the locals.

He recounted that this had led to the local doctors and staff being drawn much closer to each other. In addition to discussing their patients, teaching and learning, they talked about "practical policies which they felt deeply about well before and during the war; for example, the imperative need for a unified service with equal treatment of local and colonial doctors", said Dr Chew.

When the war ended, the colonial government agreed to unify the medical service but took three years to implement the scheme. As for postgraduate specialist training, limited numbers of doctors were sent to Britain on scholarships to attend courses but they received little training, observed Dr Chew in his speech. It is noteworthy that before 1960, there were fewer than 50 doctors who had higher specialist qualifications to serve the population of two million.

Dr Benjamin Henry Sheares, an eminent obstetrician and gynaecologist who later became Singapore's second President, wrote that "the Japanese invasion caused a general awakening of the people of Malaya. In no small measure did the local graduates contribute to this awakening, for they were able to show that, despite having been deliberately excluded from the higher echelons of the medical service, they were able, by making full use of their talents and by sheer grit, to run the hospital services as efficiently as possible under those unfavourable conditions".

These were heady times for Dr Sheares and his medical peers, like Benjamin Chew, Ernest Monteiro, K. Shanmugaratnam, B.R. Sreenivasan, Wong Hock Boon and Yeoh Ghim Seng. There was no turning back the clock. The founding of the Academy of Medicine in 1957 was an important milestone, with founder members like Professor Gordon Arthur Ransome, Dr Sheares and Dr Yeoh. In 1961, the Academy formed the Committee of Postgraduate Medical Studies which later became the School of Postgraduate Medical Studies, which in turn became the Division of Graduate Medical Studies in the National University of Singapore.

By the mid-1960s, local specialists had begun to make their impact felt. In the general hospitals, they led the way in pioneering procedures for treating complex medical problems in Singapore.

The nation's first open heart surgery procedure, on 28 January 1965, was performed by a team led by Dr N.K. Yong. As part of the preparation for this surgery, he had trained for a year from mid-1962 in the United States (US) and then spent another year training the surgical team. Under the supervision of Dr Dwight McGoon from the Mayo Clinic in the US, Dr Yong and his team sealed two holes in the heart of Miss Chua Ah Moi, then 23, with the help of an artificial heart lung machine.

Two other operations followed quickly, both on children with the same condition, in February and March 1965. Following this success, SGH set up its coronary care unit in 1967. These services would be transferred in 1994 to the Singapore Heart Centre, renamed the National Heart Centre Singapore in 1998.

The Government too had a vision of Singapore as a medical training centre for the region. In the words of Dr Toh Chin Chye (then Deputy Prime Minister), the aim was to have medical services which were "second to none". In his 8 October 1967 speech at the 62nd anniversary of the Faculty of Medicine of the University of Singapore, he censured the school for having "grown older but not wiser". He questioned the wisdom of doctors preferring to go to London, Edinburgh, Glasgow or Dublin for their specialist training, adding "it was time to consider seriously how Singapore

Time for a hair wash

Nurses used this stainless steel jug and basin combination to wash patients' hair in bed up to the 1970s. The basin held warm water and the jug was used to pour some onto the patient's head which was tilted over the side of the bed. Soap was then applied and rinsed off. How did the nurses prevent a watery mess? They draped a plastic sheet under the patient's head and shoulders to channel the water into a pail. Nowadays, hospitals have shower facilities adapted for bed-bound patients.

Kwong Wai Shiu Hospital, Mt Alvernia Hospital, Muslim Missionary Society of Singapore (Jamiyah)

Caring for the community in different ways

A century of care

Dr Ow Chee Chung,
CEO, Kwong Wai Shiu Hospital

A GROUP of Cantonese immigrants founded Kwong Wai Shiu Hospital (KWSH) 105 years ago to look after the poor and needy in their community. When Tan Tock Seng Hospital relocated to Moulmein in 1909, the land was sold to KWSH via the Kwong Wai Shiu Free Hospital Ordinance by the colonial government for 99 years at a nominal price... and we have been here at Serangoon Road since.

Over the years, more buildings were constructed thanks to funds raised by the Cantonese community. Around the 1950s, a garden pavilion was added for patients to relax in. Using mainly traditional Chinese medicine, we provided outpatient and in-patient treatments for tuberculosis patients as it used to be a chronic ailment among immigrants. We also had maternity services from the moment we started this hospital.

During the Second World War, we were lucky that the Japanese forces did not take over the hospital and we could continue to serve the community. After the war ended, we tried out a lot of new services. By the 1970s, we had both Western and Chinese medical services. Since 2006, we have had a special tie-up with the National Cancer Centre Singapore to look after cancer patients too.

Nowadays, we serve the whole community regardless of ethnicity and we're going into the next phase of medical services by building a 12-storey nursing home which will be ready by the end of 2017.

Sisters of substance

Sister Agnes Tan,
Former nurse and midwife at Mt Alvernia Hospital and Regional Superior of Franciscan Missionaries of Divine Motherhood (Malaysia/Singapore)

OUR pioneer Sisters, the British and Irish Sisters of the Franciscan Missionaries of the Divine Motherhood, were part of Tan Tock Seng Hospital when they came to Singapore in the 1930s. When I started working alongside the Sisters in the Mandalay Road Hospital in 1948, I knew right away that I wanted to join them.

In 1950, I was among the second group of nurses recruited by the Sisters and went to England for training. We were very poor. The Sisters received expat salaries for their work in Tan Tock Seng and all those salaries went into a kitty that was used to build Mount Alvernia Hospital. Once the hospital was built – it opened on March 4, 1961 – the kitty was empty. The Sisters lived on the top floor and we only charged the patients $10 a day. Whether you were rich or poor, anyone could come; quite a number of people who came to the hospital had no money.

One of these patients was a very pregnant lady who took our wood meant for the construction of one of the hospital's extensions. She told the Mother Superior at the time that her husband was a drunkard, she had eight children at home, about to give birth to the ninth child and there was no money. The Mother Superior told her to have her baby at the hospital and we wouldn't charge her. We put her in one of our small single rooms and, because she didn't have enough breast milk and was so poor, we also provided baby formula. When she was going home, we gave her milk powder and told her to come to us when she was short of milk. Every time she came, she would pick flowers and bring a bunch to us. She was grateful for what we did for her.

That was part of our start as a hospital and even though it was hard, we just did it. I am very proud of Mount Alvernia and how far we have come.

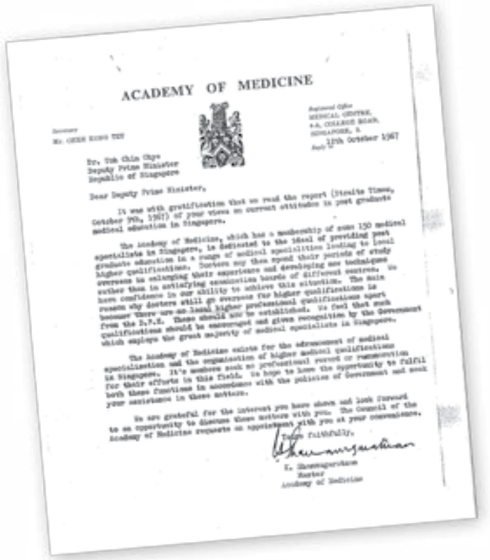
Serving the society

Dr H.M. Saleem,
Vice President I, Muslim Missionary Society of Singapore (Jamiyah)

WHEN Jamiyah was founded in 1932, our mission was to support the Muslim community in spiritual, educational and welfare matters. We were known then as the All-Malaya Muslim Missionary Society with branches in the various states of Malaysia. After the separation from Malaysia, we changed our name to the Muslim Missionary Society Singapore but we remained cordial with our former Malaysian branches.

Our real push to serve the community better began in the 1970s when Haji Abu Bakar Maidin took over as president of Jamiyah. Then we had 190 members and about $5.60 in our fund. Now we have over 30,000 members and we have more about $17 million a year to fund our projects. In 1975 we started our free medical clinic in Geylang, staffed by volunteer doctors and nurses. We felt we needed to help the very poor and needy members of the community. We also started a whole range of welfare homes and residential services like the Jamiyah Children's Home for orphans, Jamiyah Home for the Aged, Jamiyah Nursing Home for those needing long-term nursing care and Jamiyah Halfway House for recovering addicts. Our home for the aged is open to all Singaporeans.

Now we are embarking on expanding and upgrading our services to meet the needs of the ageing population. We are planning another nursing home and renovating our current residential medical nursing home, Darul Syifaa. Thanks to the support from the community and the Government, Jamiyah has overcome many challenges in its quest to help Singapore be a better society.



ACADEMY OF MEDICINE

National Office
MEDICAL CENTRE,
3A, COLLEGE ROAD,
SINGAPORE, 3.
12th October 1967

Dr. Toh Chin Chye
Deputy Prime Minister
Republic of Singapore

Dear Deputy Prime Minister,

It was with gratification that we read the report (Straits Times, October 7th, 1967) of your views on current attitudes to post graduate medical education in Singapore.

The Academy of Medicine, which has a membership of some 150 medical specialists in Singapore, is dedicated to the ideal of providing post graduate education in a range of medical specialities leading to local higher qualifications. Doctors may then spend their periods of study overseas in enlarging their experience and developing new techniques rather than in satisfying examination boards of different centres. We have confidence in our ability to achieve this situation. The main reason why doctors still go overseas for higher qualifications apart, however there are no local higher professional qualifications apart from the D.P.H. These should and be established. We feel that such qualifications should be encouraged and given recognition by the Government which employs the great majority of medical specialists in Singapore.

The Academy of Medicine exists for the advancement of medical specialisation and the organisation of higher medical qualifications in Singapore. It's members look on professional record or remuneration for their efforts in this field. We hope to have the opportunity to fulfil both these functions in accordance with the policies of Government and seek your assistance in these matters.

We are grateful for the interest you have shown and look forward to an opportunity to discuss these matters with you. The Council of the Academy of Medicine requests an appointment with you at your convenience.

Yours sincerely,

K. Shanmugaratnam
Master
Academy of Medicine

could offer postgraduate studies to students with the necessary facilities".

His criticism drew an immediate response from the Academy of Medicine. The Council, led by its Master Dr Shanmugaratnam, wrote to Dr Toh declaring its commitment to the "advancement of medical specialisation and the organisation of higher medical qualifications in Singapore".

A morning coffee meeting on 4 November 1967 between Dr Toh and the Academy's council members resulted in a letter being sent to Health Minister Yong. The letter suggested that "higher professional qualifications in various clinical specialisations be awarded by the University and that the School of Postgraduate Medical Studies be reconstituted to enable the Academy to participate as equal partners in the training programmes and examinations".

Things moved quickly after that. Dr Toh became vice-chancellor of the University of Singapore in April 1968 and pushed through significant changes in the statute of the medical school, chairing the new medical school board himself. In 1970, Health Minister Chua appointed a Committee on Medical Specialisation to recommend a programme of medical specialisation that would "meet Singapore's needs, and to make the republic an internationally pre-eminent centre for treatment, training and research".

▲ For the record… when Deputy Prime Minister Toh Chin Chye asked the Academy of Medicine in 1967 why they were not making any progress in the field of higher professional education, they sent him a letter (above) requesting a meeting with him. That meeting led to the Committee on Medical Specialisation being set up.

Mr Chua said the Government had to take the lead because "the private sector will not for a very long time be able to develop the very sophisticated specialities such as radiotherapy, neurosurgery and cardiac surgery which involved extremely high capital cost".

The committee's report was accepted and the specialities recommended were quickly introduced – neurosurgery, cardiothoracic surgery, plastic and reconstructive surgery, nephrology and paediatric surgery. These were in addition to ongoing sub-specialisation within the general specialities, including urology, hand surgery, microvascular surgery, gastroenterology, endocrinology, oncology, respiratory medicine and reproductive medicine.

Through much effort, the acquisition of specialities and sub-specialities gained brisk momentum. For example, patients with chronic renal failure were offered new hope in 1968 when the first two patients started regular haemodialysis in SGH. Two years later, SGH carried out Singapore's first renal transplant and, in 1977, the first two living-related renal transplants were performed, making the living-related donor transplant programme a success.

Limb reattachment surgery also made its mark when Alexandra Hospital, by now serving civilians after it was handed over by the British military, conducted the first such procedure of its kind in Singapore in 1975. Surgeons successfully re-attached 17-year-old Wong Yoke Lin's arm after it was torn off at the elbow when she tried to remove a jammed piece of wood from a machine she was tending at a plywood factory. Doctors at Alexandra Hospital used their medical skills and a bit of improvisation, which eventually allowed the Ipoh girl to regain the use of her arm – the reattached arm had grown cold and turned white and various attempts to resuscitate it failed until one doctor hit on the idea of soaking it in a pail of warm water to encourage blood flow.

Change was also underway in the philosophy behind provision of care for mental health patients.

▼ Handy work…. in what was Singapore's first limb reattachment surgery, doctors at Alexandra Hospital successfully re-attached 17-year-old Wong Yoke Lin's arm after it was torn off in an industrial accident in 1975.

Prior to the 1970s, such patients could only look towards custodial care. However, the introduction of tranquilisers in the previous decade had helped to stabilise many patients, allowing them to be discharged. It also allowed the hitherto forbidding – in the eyes of the public at least – hospital to gradually remove the metal bars on many of its doors and windows.

As the years passed, there was growing recognition in the medical community that many mental patients could be rehabilitated and reintegrated into normal social life. This, coupled with better public understanding of mental health issues and hence lessening prejudice, would eventually lead to the creation of the Institute of Mental Health.

Hospital infrastructure and its adequacy to provide modern medical care also came under scrutiny and revamp. In 1971, a firm of consultant planners was hired to ascertain the requirements for hospital services over the next 20 years, to plan for these needs and to redevelop SGH. The report was completed in April 1972 and approval was given in November of the same year for construction of a new hospital in the Outram Road area.

The foundation stone of the new SGH was laid in 1975 and its doors were opened on 12 September 1981 by Prime Minister Lee.

Volunteer force

From its earliest history, Singapore had concerned residents among its polyglot communities who saw Singapore as home and invested their time, energy and money for the betterment of the colony and its people.

Faith and community-based organisations had through the decades stepped up to the plate to provide healthcare to the people, often filling critical gaps even as the public healthcare system developed and grew. Many of them had champions within their ranks in whom the spirit of public service was strong and pushed for their visions to be realised. (See article on Jamiyah Nursing Home, Mt Alvernia and Kwong Wai Shiu Hospital on Pages 66-67.)

As far back as 1885, nuns from the local French Convent had begun to care for the sick in the General Hospital at Sepoy Lines. It is from this year that Singapore's nursing profession dates its founding.

Singapore's first volunteer community hospital began life in 1913 as the St Andrew's Medical Mission, a dispensary for women and children in Bencoolen Street. It was founded by Dr Charlotte Ferguson-Davie, an accomplished doctor and wife of the first Anglican bishop posted here. Being sensitive to women's discomfort at being attended to by male doctors, she opened the clinic to women and children of all races.

Manned by female medical officers, St Andrew's Medical Mission treated the poor for free. Those who could afford it, paid for medicines and charges according to their means. This first clinic was quickly followed by others in Upper Cross Street, Pasir Panjang, New Bridge Road, and River Valley Road.

▲ Mission possible… set up in 1923, St. Andrew's Mission Hospital had 60 beds exclusively for women and children.

There was more to come. Ten years later, she founded the 60-bed St. Andrew's Mission Hospital (SAMH) for women and children at Erskine Road. She also started training local women in a new three-year nursing and midwifery programme. In 1924, SAMH expanded its services to include specialist clinics, including a venereal disease clinic for women exposed to sexually transmitted diseases due to rife prostitution at the time. An orthopaedic hospital for children opened in 1937 in Elliott Road, by the sea. The new mission hospital was opened in Tanjong Pagar in 1949 after World War II.

In the 1980s, when the major hospitals like SGH and Tan Tock Seng Hospital started providing adequate in-patient services, the Tanjong Pagar and orthopaedic hospital at Elliot Road were closed, pending decisions for their future use.

Another volunteer institution whose name resonates with Singaporeans is SATA, the acronym

► Battling tuberculosis… in the 1950s, SATA treated people suffering from tuberculosis and equipped recovering patients with vocational skills such as sewing, book binding and carpentry.

for the Singapore Anti Tuberculosis Association. The idea of doing good for their countrymen sprang from conversations among a group of men interned in the cells of Changi jail and the Sime Relocation Camp during the Japanese Occupation. In August 1947, free men once again, they formed SATA a couple of years later and set up its first treatment unit in a wooden hut in the grounds of the St Andrew's Mission Hospital in Tanjong Pagar. Using funds raised from the public, it provided outpatient diagnostic and treatment services for people suffering from tuberculosis. In addition, it equipped recovering patients with vocational skills such as sewing, gardening, printing, book binding and carpentry during rehabilitation.

This garnered the attention of local philanthropists. Local businessman Lee Kong Chian was moved by these efforts and donated his massive South Winds resort on the west coast for use as a convalescent settlement in August 1954. Ten semi-detached cottages for ex-patients and their families were built on the site.

At about the same time, philanthropist G. Uttamram donated a six-acre site along Upper Changi Road, the site of the present headquarters of SATA (which was renamed SATA CommHealth in 2009 to reflect its expanded role in community healthcare).

Shared responsibility

Singapore's healthcare financing policy had always been predicated on the premise that responsibility should be shared between the Government and the people.

In fact, as soon as the new People's Action Party government took the reins of the emerging nation, it made a critical decision that would become the foundation stone for today's shared responsibility for healthcare services. It took the bold step – bold because of the poverty prevalent in Singapore then – of breaking with the precedent set by the colonial government of providing free services in outpatient clinics, the British National Health Service model.

The Government though stressed the point that the fee was meant to instill the message of sharing responsibility between it and the people to manage their health. It even demonstrated that the fees would not add appreciably to the public funds. On the other hand, government expenditure on healthcare increased fourfold in the 1970s, driven by increasing hospital admissions.

The Government paid close attention to the rising costs of medical care. Prime Minister Lee recalled wryly in his memoirs: "The idea of free medical services collided against the reality of human behaviour, certainly in Singapore. My first lesson came from government clinics and hospitals. When doctors prescribed free antibiotics, patients took their tablets or capsules for two days, did not feel better and threw away the balance. They then consulted private doctors, paid for their antibiotics, completed the course and recovered."

Looking back now, Singapore within its first decade of independence had transformed itself from a backward slum into a bustling city with a bright future. However, as is most often the case, it is left to Mr Lee to best summarise the gains of the decade.

Reflecting on Singapore's first 10 years of independence, he said in his 1975 National Day rally speech: "The past decade was probably the most spectacular of all the 10 years of Singapore's history. There has never been such rapid development in any 10 years. The physical landscape changed with new buildings, new roads, fly-overs, traffic jams, homes, new factories. Our GDP went up, at factor cost, nearly three times, between 1965 and 1975. We seized every opportunity to develop as fast as we could because 10 years ago, you will remember, there was massive unemployment – at least over 12 percent. Ten years after, with the new standards of incomes, we have got ourselves into a different mood, the younger generation especially – people who were not old enough in 1965 to understand what hardship and unemployment meant."

"There has never been such rapid development in any 10 years. The physical landscape changed with new buildings, new roads, fly-overs, traffic jams, homes, new factories. Our GDP went up, at factor cost, nearly three times, between 1965 and 1975."

Prime Minister Lee Kuan Yew, in his 1975 National Day rally speech

The bus that few wanted to hop onto

The SATA bus, as it was called, was part of the Singapore Anti Tuberculosis Association's Mobile Treatment Service introduced in 1955. Equipped with X-ray machines, it was used to treat tuberculosis patients who were too poor or unwell to visit the SATA clinic. Four such mobile clinics are in operation today, three with X-ray machines and one capable of doing mammography.

I solemnly pledge to:

practise my profession with conscience and dignity;

make the health of my patient my first consideration.

Extract from the Physician's Pledge which has been in use in Singapore since May 1995. It is based on the Hippocratic Oath and the Declaration of Geneva which was adopted in 1984 by the World Medical Association. From December 2010, it became compulsory under the Medical Registration Act for all new doctors to affirm the pledge at a Singapore Medical Council Pledge Ceremony before being allowed to practise medicine independently in Singapore.

Leap of faith... more than 400 people took part in this event. It reflected the success of the Singapore River clean-up which began in 1977 and contributed to the overall hygiene levels of the nation.

Shifting paradigms

Raising capabilities in public healthcare

1975 - 1985

It has often been said the post-independence Government and the pioneers in the healthcare services worked without a script. The blank sheet presented both threats and opportunities. Threats because there were few guideposts to show what policies and strategies might work. Opportunities because the lack of precedent allowed flexibility to study needs, tailor solutions and test ideas.

As Dr Toh Chin Chye, Singapore's first Deputy Prime Minister, said in the early 1970s: "We have taken our political future firmly into our own hands… and we are faced with the task of building our own brave new world."

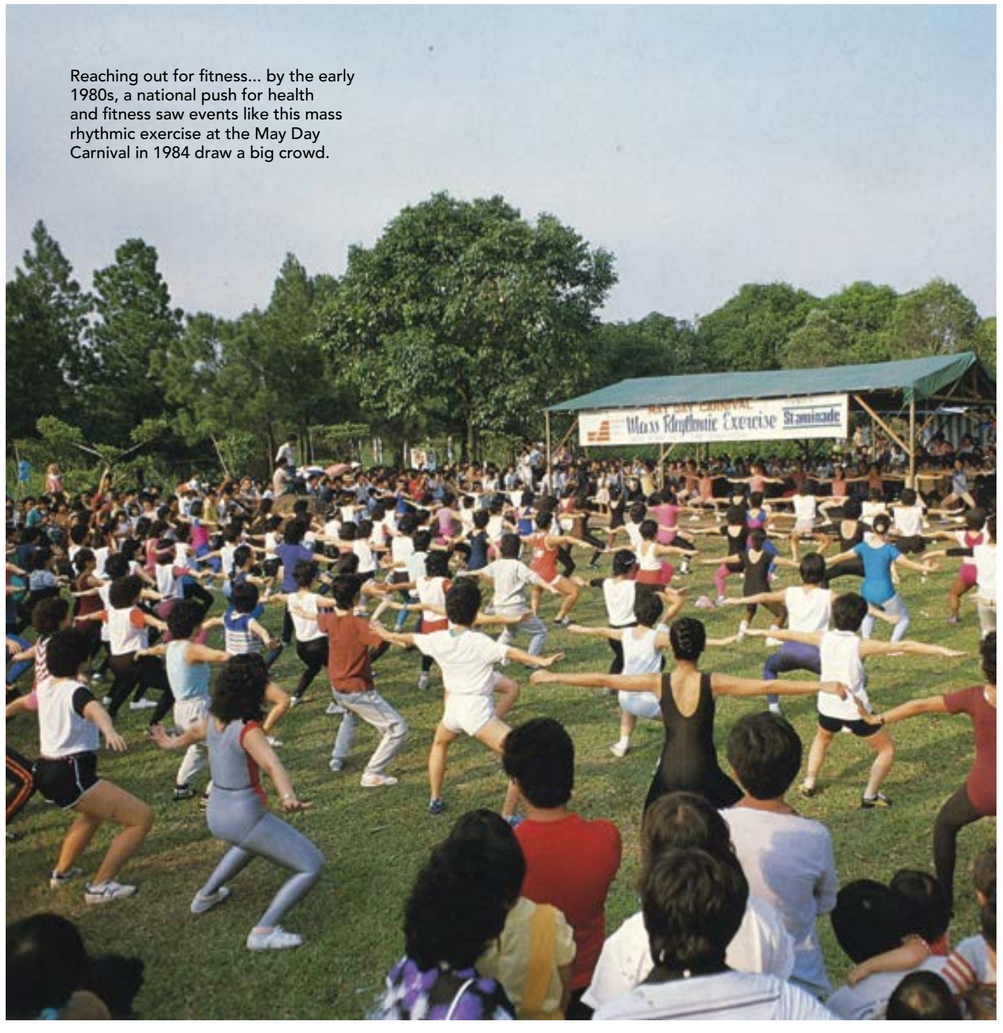
The significant gains made in the first decade of independence promised more and better things to come. National infrastructure had expanded. There was rapid growth in entrepot trade, foreign investments, industrialisation, jobs and incomes. On the home front, to borrow the words of Mr Chua Sian Chin, "rapid development and progress in the last decade have brought about a radical change in our lifestyle".

Speaking in 1980 as Home Affairs Minister, Mr Chua (he had left the health portfolio in 1974) said: "We now live in better houses. We are better clothed and fed. We live and work in a cleaner environment. We maintain a high standard of personal hygiene. With this better standard of living, the general health of our population has improved. Infectious diseases such as tuberculosis, malaria and typhoid which were the major causes of ill health and death to our population in the past are no longer of significance."

Ironically, success brought its own set of challenges in the second decade. Again, Mr Chua summed it up well: "However, ill health and death caused by disease are still with us. Non-infectious diseases have now become the major cause of ill health and death. Heart disease, cancer, diabetes and high blood pressure are now among the top 10 causes of ill health and death in Singapore."

He highlighted that the root cause of these problems were the "harmful lifestyles" that came with rising affluence. These included overeating and the consumption of foods high in saturated fats and excessive sugar. Smoking was another factor, coupled with a more sedentary lifestyle resulting from improved transportation and lifts to "carry us up and down". Stress, too, was taking its toll and suicides then ranked among the "top 10 major causes of death in Singapore".

Indeed, this was the situation that Dr Toh inherited in June 1975 when he became Health Minister, succeeding Mr Chua. In a landmark two-part interview with the now defunct New Nation newspaper in August 1977, Dr Toh outlined the key issues confronting public healthcare and the proposed solutions. Among them were the rising cost of medical care and overcrowding and understaffing at the hospitals. There was an urgent need to train more doctors and nurses even as some were tempted by the better salaries in the private sector.



Reaching out for fitness... by the early 1980s, a national push for health and fitness saw events like this mass rhythmic exercise at the May Day Carnival in 1984 draw a big crowd.

"We have taken our political future firmly into our own hands… and we are faced with the task of building our own brave new world."

Dr Toh Chin Chye, Singapore's first Deputy Prime Minister

Larger issues were also at play beyond the rapidly changing lifestyles. Rising affluence had led to rising demand for healthcare, straining the still limited facilities. As in the previous decade, the Ministry of Health (MOH) approached the problems of the day with creativity, energy and commitment towards the larger goal of a healthy population. These required different approaches to providing healthcare, leading to new strategies. Ultimately, these pressures would lead to the review of healthcare financing laid out in the National Health Plan of February 1983.

Tackling healthcare pressures

The health service was also affected by mounting inflation, some of it caused by global forces beyond Singapore's control. The first oil shock in late 1973 quadrupled oil prices and caused a surge in Singapore's imported inflation. Increased demand for hospital services from a growing population added to the costs. Between 1970 and 1975, the public healthcare budget rose from $53 million to $154 million. As hospitals were consuming two-thirds of the Ministry's expenditure, Dr Toh said they had to be "more particular about admitting patients into hospitals and also increasing throughput… to make the most use of the number of beds we have at this moment".

Hospitals at this time were facing a shortage of beds. Even the Accident and Emergency (A&E) departments were "heavily loaded with unnecessary visitors" who did not need emergency treatment. Dr Toh outlined a five-pronged complementary approach to tackling these issues.

First, sorting out the issues of overcrowding and understaffing. The plan was to discharge patients who were well enough to be managed at home. Their treatment could be followed up at the outpatient clinics or polyclinics. Even Woodbridge patients, with the "wide range of psychotropic drugs" available, could be managed as outpatients.

Second, patients needing diagnostic tests could be given outpatient appointments. This would

$154 million

The bill for public healthcare in 1975 due to increased demand for hospital services from a growing population. In 1970, it was $53 million

▲Mmmmilk... malnutrition was countered by the School Milk Scheme which started in 1974. Two months after the launch, 27,000 children from 34 schools were taking part, buying milk at 10 cents a pack.

eliminate the need for an overnight stay, freeing up beds for those who really needed them and saving the patient money.

Third, the mainstay of public health education. This would be aimed at helping people to better understand their conditions and seek the appropriate level of treatment. For example, going to the polyclinic as a first resort rather than to the A&E departments. The hospitals could also triage or screen patients so that those in urgent need would be attended to first.

Fourth, the role of primary healthcare in early treatment of illnesses. Seeking better coordination in this area, the Maternal and Child Health Service (MCH), the School Health Service (SHS) and the outpatient services had already been brought under the newly formed Primary Health Care Division a year earlier.

The fifth prong would be the continuation of vaccination programmes to ensure that people did not fall prey to contagious diseases. This preventive measure would underline the Government's emphasis on the population pursuing a healthy lifestyle.

"Milking" new ideas for children

While these weighty national issues were being addressed, the healthcare services shouldered the heavy responsibility of resolving challenges on the ground. One such challenge was malnutrition among children. Such was the effort put into fixing this problem that, by the late 1970s, it had morphed into children being overweight.

The MCH service had initially employed a mix of measures to combat malnutrition. Among them were direct supplementary feeding and intensive follow-up of severely malnourished children. Mothers were educated about the right choice of foods for their children and their preparation.

This work also included dispelling myths about weaning and expounding the nutritional benefits of breastfeeding. As mothers were diluting milk powder too much in an effort to make the expensive item last longer, they had to be taught the correct dilution levels. At the same time, they were also informed about the disadvantages of replacing powdered milk with condensed milk.

Concurrently, the SHS had two feeding schemes going for undernourished schoolchildren. Under the UNICEF Skimmed Milk programme of the early 1970s, children identified as being malnourished drank a cup of milk every day in school. Underweight children, especially those who were very undernourished, took home food rations fortnightly too. For example, the 1973 Annual Report of the SHS listed the rations as "1½ lb fullcream milk, ¼ lb Ovaltine, ½ lb sugar, 1 lb groundnuts, 12 hen eggs, ¼ lb ikan bilis".

Such was the Government's concern for all children to have access to supplemental nutrition that it launched the School Milk Scheme in February 1974 for all schoolchildren. The results were fast and encouraging. Two months after the launch, 27,000 children from 34 schools were taking part, buying milk at 10 cents a pack. By March 1976, The Straits Times reported that more than 100,000 children in 200 primary schools were buying milk, at 12 cents a pack.

Success soon brought its own problems. By 1981, only 21 percent of the 54,000 still on the scheme took milk, a drop described by the Education Ministry as "frightening". Various reasons surfaced, including blaming the soft drinks industry for its aggressive marketing to children. The children themselves gave various reasons, from not liking the milk to being tired of drinking it daily to the fear of getting fat, especially among the girls.

In fact, the signals had been visible in the late 1970s. Dr Quek Kai Miew, head of the SHS until 1978, said in a review of the School Milk Scheme at a nutrition conference in July 1979 that while four to five percent of Primary 1 children were still undernourished, obesity had become a concern with rising affluence.

Even though low-fat milk in more attractive packaging was introduced to encourage more consumption, the milk programme was temporarily halted by August 1988. The Milk for Children Advisory Council evaluated the possibility that milk was contributing to the weight issues emerging among primary school students. Post-review, the programme was resumed and continued to supply milk to underprivileged children.

To be fair, weight gain among children could not be blamed on milk alone. Rising affluence was at fault too. As Health Minister Chua Sian Chin had pointed out, Singaporeans were increasing their intake of food high in

▼Growing problem... by the late 1970s, obesity become apparent among schoolchildren due to higher standards of living.

Karthigesu Thiayagarajah, former Public Health Inspector

The devil is coming, you better run

THAT'S what the illegal hawkers would shout to each other in dialect when we public health inspectors approached them in the 1960s and 1970s. They would curse us in all sorts of languages as they grabbed their makeshift tables and utensils, and ran.

Experiences like this were part of my daily life when I started work as a cleansing inspector in 1958. At that time, I was employed by a department called Rural Health. In 1961, the department merged with the City Council and was named the Public Health Department (PHD). Located at Palmer Road under the Ministry of Health for a short while, it eventually moved to the Ministry of Environment.

As cleansing inspectors, we were in charge of the streets and collecting refuse from the houses. When the PHD was formed, I was posted to Havelock Road and, after nine years, promoted to public health inspector. I was sent for a course as part of the promotion and cleared The Royal Society of Health exam.

As a public health inspector, I had to inspect shophouses and eating houses, especially illegal hawkers. We would patrol in groups, and even had a police escort with us. That's when we would be called "the devil" by the illegal hawkers.

We would even go for raids at night to crack down on illegal pig slaughtering. The pig farmers did not want to use the slaughterhouse as it cost money, so they did it themselves. I can still remember catching pig farmers illegally slaughtering their pigs at the Lorong Ah Soo kampong. That's when we were grateful for the police escort... in case these fellows with their big slaughtering knives turned violent. Thankfully, I never experienced any such attack.

Ironically, it was from my own colleagues that I had to endure some violence. When the daily-rated cleansing workers went on strike, my fellow health inspectors and I had to organise the cleaning of refuse which had not been removed for days. We did it with a police and military escort, but still got stoned by the workers who were on strike.

We even had to work during the racial and Hock Lee bus riots (1955). When the curfew was lifted, we used to go in to clean up the streets. It was very frightening when the curfew lifted, especially in Bukit Panjang, as the rioters would come out with their knives and parangs (long knives) and chop anyone who was walking. I saw so many people injured.

It was a tough time. We were on the streets to do our jobs. That was our duty. We had to continue... curfew and no curfew; we had to remove the rubbish.

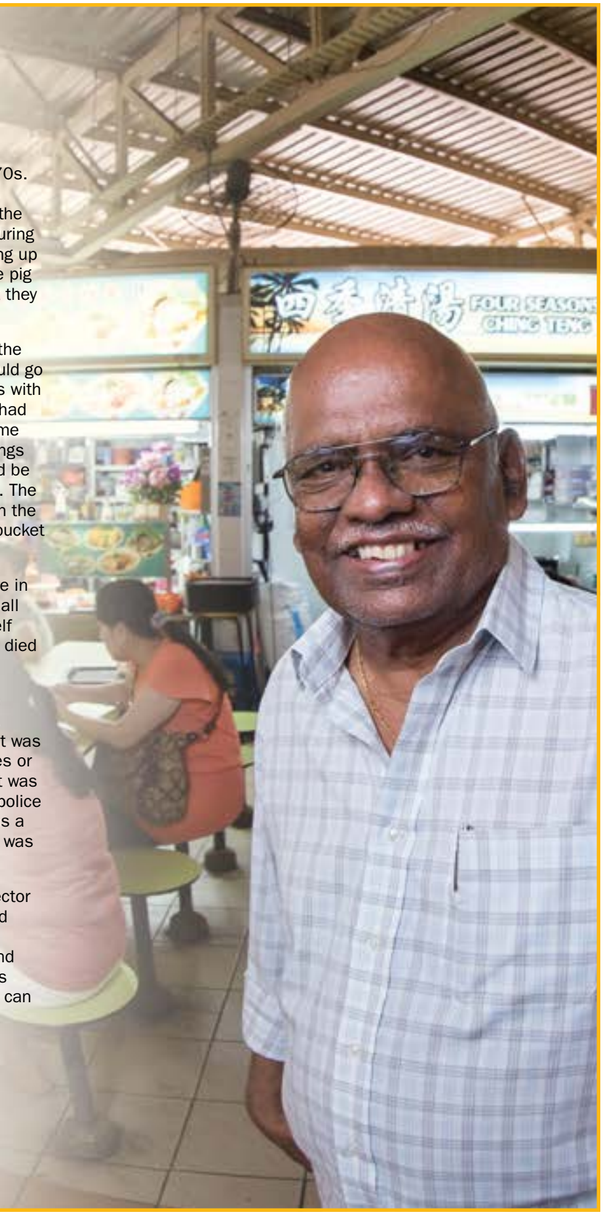
I was also part of the cleaning of the Singapore River in the 1970s. The river was polluted because of the street hawkers and pig farms near its streams. All the pollution eventually ended up in the Singapore River. The hawkers were washing their dishes and pouring the remains into the river. Worse, the pig faeces were also ending up in the river. So the hawkers were put in hawker centres while the pig farms were relocated to Lim Chu Kang. They were not happy but they didn't have a choice.

Around that time the engineering department at the Ministry of the Environment had a section called Kampong Sanitation. They would go into the kampongs to construct drains and create washing areas with a pipe for washing clothes and bathing. This was also when we had pit latrines and bucket latrines. The night soil workers would come with their vans, collect the night soil in buckets from the kampongs and take it to the disposal station at Bugis Street where it would be flushed down the sewer. They would wash the buckets there too. The smell was, to put it politely, very "exotic". Things got better when the flushing system was introduced even in the kampongs and the bucket system and pit latrines slowly disappeared.

One of our biggest clean-up jobs was after the Bukit Ho Swee fire in 1961. Bukit Ho Swee was a terrible slum and, after the big fire, all the victims had to set up camp in nearby schools. The slum itself was filled with rotting carcasses of dogs, cats and pigs that had died in the fire. Plus, there were pit latrines being used.

Not only did we have to rush to provide proper sanitation for the affected people, we also had to work fast to clean up the mess. If not, there was the strong possibility of disease breaking out. It was a huge job as Bukit Ho Swee was a large area... about 150 acres or two football fields. I still remember the smell of dead animals. It was terrible. We also had to get the other agencies to help, like the police and military who came in to prevent looting. In a way, the fire was a blessing of sorts as Bukit Ho Swee was a gangsters' den and it was cleared.

From the 1980s onwards, things became a little quieter. I did vector control, finding mosquito breeding grounds and eventually moved to a desk job to do administrative work until I retired in 1993. There was a lot to do in the early years. With the riots and the union strikes, it was very exciting and sometimes quite frightening. But, looking at Singapore now, I can proudly say that it was all for the better.



◄ Hawking blues... illegal street vendors were targets of public health inspectors like Mr Thiayagarajah who were tasked to ensure hygiene.

unsaturated fat and the incidence of heart diseases and cancer had risen sharply in the two decades since independence.

In the ensuing decade, the focus would shift. The Ministry of Education would launch the Trim and Fit (TAF) scheme for schoolchildren, encouraging them to be more active and more selective about their food. School canteen operators were also urged to offer healthier food. For the populace at large, the Ask For Healthier Food campaign would eventually be launched to get Singaporeans to ask for food with less salt, less oil and more vegetables, a trend that continues today.

The SHS had a sizeable problem too – finding a way to cope with the records of the rising numbers of students under its purview. Officers found themselves struggling with the sheer volume of cards – over 500,000, pink for girls and white for boys – and the growing number of school rounds.

Not only did relevant cards and health check equipment have to be carted along for each school visit, the cards had to be updated and filed later, eating up manpower and resources. The health booklet, a simple creative solution to this logistics nightmare, would make a lasting difference till today.

The first health booklet replacing the pink and white cards was given only to primary school students in the early 1980s. It was used to record data like their growth, physical observations and immunisations for preventive healthcare. At the time, pre-school children had a mother-and-child health booklet. In 1984, both were replaced by one comprehensive book that tracked a child from birth until age 18.

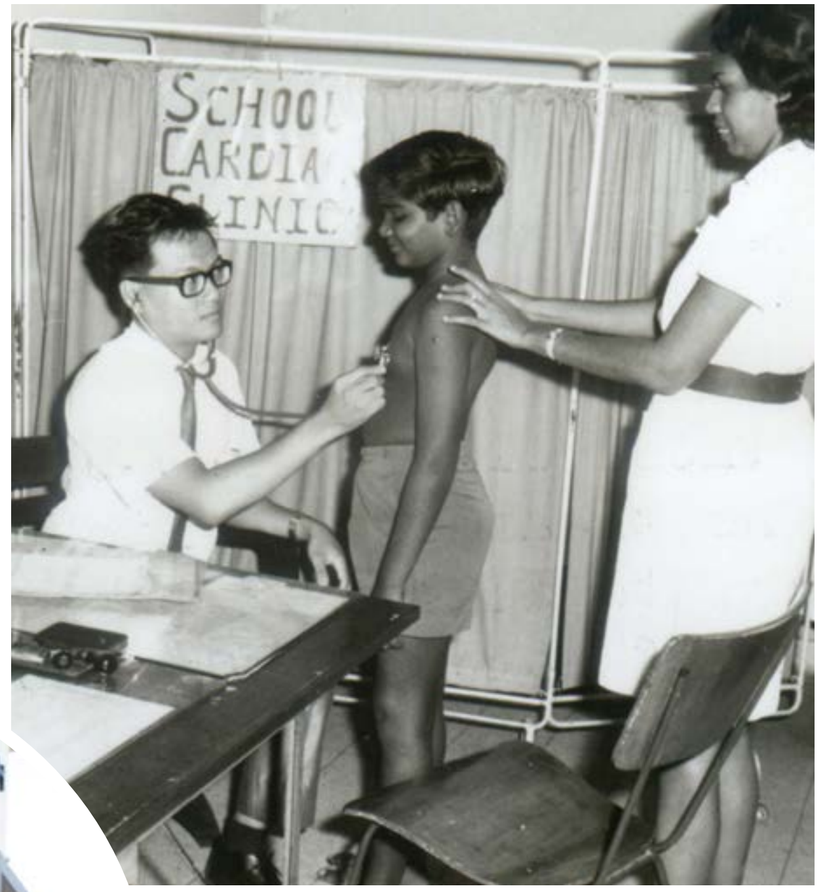
The new book was a crucial link among medical personnel, education staff and parents, giving them the same information at one go, said Dr Uma Rajan, who worked in the SHS from 1972, and eventually became its director. Mothers had always been the source of useful information on clinic visits. However, with a growing economy, more of them held full-time jobs and were not so omnipresent. With the book, SHS officers could keep track of every child's growth rate, height, weight and immunisations.

Concurrently, the SHS expanded its scope of work

500,000

Health record cards – pink for girls, white for boys – were managed by the School Health Service in the 1970s

► Heart of the matter... the nation's rapid progress brought new issues for the School Health Service, with non-communicable ailments such as heart, visual, learning and emotional problems surfacing among students.



▼ Keeping track... during her time at the School Health Service, Dr Uma Rajan worked on the school health booklet which tracked the physical growth of children from birth to age 18.

as new health issues emerged. Special clinics were set up to deal with cardiac, visual, learning, emotional and behavioural issues even as existing problems such as dental and skin diseases, tuberculosis, malnutrition and anaemia came under control. Teaching children to eat healthily was an important strategy as well.

"There were growing children. The economy was changing and growing and the policies were changing. We had to keep moving with the times. Health education became crucial, so we had health fairs and organised events like sandwich competitions to promote healthy eating," explained Dr Rajan.

Overcrowding, understaffing

In the hospitals and outpatient clinics, the issues of overcrowding, understaffing and overworked medical staff – thanks to a shortage of doctors, nurses and nursing aides – were receiving active intervention from MOH. So too the problem of senior specialists being tempted to leave for the private sector.

Doctors in the primary care sector had complained of being overworked as demand for these services grew. For example, in 1979, there were 2.9 million attendances at outpatient dispensaries and one million at MCH clinics. Each outpatient doctor saw an average of 118 patients a day while an MCH doctor saw 84 patients! The numbers would have been bigger if nurse practitioners had not been introduced in 1975 to help doctors with the workload.

Nurses and nursing aides were also in short supply. Demand for nurses arose from a variety of factors – introduction of more medical services, advent of specialisations, sophisticated equipment and new procedures requiring specially trained nurses as well as nurses being incorporated into team-based care. Nurses were also leaving for the expanding private healthcare sector. There was growing demand for nursing aides who could cover the routine duties of nurses, freeing the latter for more skilled work.

The Government took the view that as long as doctors and nurses continued to practise in Singapore, they were not lost to the profession. The real issue was if they stopped practising.

To boost the numbers of doctors, more students were being admitted into medical school. To incentivise them to stay in public service after they qualified, young doctors with potential were identified early to receive training from their seniors and given the opportunity to specialise. In time, they would take over from their seniors when the latter retired. Respected and experienced private sector specialists were also being appointed as honorary or part-time consultants to augment a hospital's pool of specialists.

Specialist doctors and dental officers were offered a big carrot to stay. From September 1980, they could earn half the fees for operations and accouchement (assisting in childbirth), and $25 of the $35 consultation fee paid by a patient. As this new Consultancy Fee Scheme paid 60 percent more than the existing monthly salary and fixed allowances scheme, they had the option to choose either scheme. More superscale salary grades were also created. Medical officers and registrars also stood to earn more as their night duty allowance was raised.

Concurrently, the Government had been studying a long-term, more market-based approach to retaining the best brains in the civil service. The recommendations of the Professional Services Review Committee, formed in 1979, were announced in March 1982. It recommended sizeable pay increases for those in the premier administrative and professional services to stem the brain drain and attract new entrants. The Government also promised revisions to come for other services.

For nurses and midwives, pay rises of between 8.6 percent and 18.7 percent across all grades and night duty allowances followed quickly in June 1982, 10 years after the last revision. MOH and the Amalgamated Union of Public Employees said in a joint statement that the "enhanced salary scales will attract school leavers to take up nursing as a rewarding and satisfying career".

While these measures sought to stem the tide, some hard-headed strategy was needed to tackle rising demand. As MOH saw it, the common thread running through rising healthcare costs and manpower shortage was that improving healthcare could create its own demand. Health Minister Toh in May 1980 argued that insurance schemes gave the illusion that healthcare was free, when it was in effect paid for through taxes and premiums. This could lead to people seeking unnecessary treatment. For example, going to hospital when outpatient treatment would suffice, or heading to the A&E departments instead of the outpatient clinic.

Dr Toh said the physician's dual role as "adviser to a patient and as a profit-oriented entrepreneur" also meant market forces were not in play as "physicians, as suppliers, also create their own demands". They decided on hospitalisation, return visits, ordered tests and gave referrals to specialists.

118

Average number of patients each outpatient dispensary doctor saw per day in the 1970s

Dr Kwa Soon Bee

Leader, doctor, civil servant

Permanent Secretary and Director of Medical Services from 1984 to 1996, Dr Kwa was not just a leader but mentor to many. His leadership philosophy, from those he nurtured, and in his own words, is shared below

In his own words...

A GOOD and effective civil servant must be one who can lead by example – somebody who can build a team and manage a team. He must be the one who is willing to see all sides of the problem, one who is accepted by both the clinician and the administrator and the politician, and one who can always build a team such that there is assured succession.

Leadership starts from within the ministry. How we run our healthcare, how we structure our primary health, how we structure our hospitals, how we structure our School Health Service, how we run our Accident and Emergency; every little thing really has an impact on the whole nation. In that respect, you are sometimes forced upon with a feeling of humility. You have to remind yourself that whatever you're deciding on will impact on people and their lives.

Extracted from Dr Kwa's 1995 interview with the Oral History Centre, National Archives of Singapore.

Boss, mentor, guiding light

Mr Liak Teng Lit
Group Chief Executive Officer, Alexandra Health System

I WAS a junior pharmacist, about 26 at the time, at Singapore General Hospital when I first encountered Dr Kwa Soon Bee. He was the medical superintendent there and I was an enthusiastic young man lobbying for a nutrition team and a Total Parenteral Nutrition (TPN) service where you feed patients who are very malnourished through an intravenous (IV) line.

As part of my pitch, I was passing around an article from the British Medical Journal about setting up a hospital nutrition team. That's when Dr Foong Weng Cheong who was the head of surgery – who had a reputation for being very fierce – marched me into Dr Kwa's office and said something along the lines of "Soon Bee, we want to set up a nutrition team".

Dr Kwa asked what I had in mind. As a young pharmacist who had been told 10,000 times that we didn't have the money to do anything new, I nervously explained that lipids are the most expensive item when it came to feeding patients via an IV line, so we could save money if we shared the lipids between two patients. Before I could finish, Dr Kwa said: "Why is it that when you people have to do something, you have to cut corners? Your job is to tell me what you need; my job is to find the budget." My jaw dropped. Within three months, the budget for the TPN service was approved.

That was my No. 1 lesson from Dr Kwa: Your job is to do your job; his job is to support you. It is a guide to how I do my job. As a CEO, you don't look after patients directly. The job of the administrator is to ensure that the people on the ground can get things done.

Taking healthcare from third world to first

Prof Tan Ser Kiat
Chairman, SingHealth Foundation & Emeritus Consultant, Singapore General Hospital

THE first time I had direct contact with Dr Kwa Soon Bee was in 1979, when I returned from the United Kingdom where I had undergone 1½ years of further training under the Colombo Plan. He asked to meet me as in those days it was very rare for people to go overseas for their advanced training. I was initially overawed by him but, as the conversation went on, he was very casual and nice. He just wanted my views on the training I had received overseas. I told him it had been a tremendous opportunity.

Dr Kwa saw the value of overseas training and wanted all junior doctors to undergo a short stint. He eventually persuaded the Ministry of Health to fund what is now the Health Manpower Development Programme. There is no question about what he did for Singapore's healthcare service. I would sum it up as pushing it from the third world to first. He pushed for better healthcare services, specialisations as well as training of doctors, nurses and other healthcare workers.

One of his biggest contributions is the rebuilding of all the hospitals: Singapore General Hospital where he personally chaired the rebuilding project, National University Hospital, KK Hospital (now KK Women's and Children's Hospital), Tan Tock Seng and Changi General Hospital. He was a very hands-on man and wanted the staff to be well-acquainted with the rebuilding efforts. He would have informal sessions with the doctors, seeking our frank opinions on improving the system. Fundamentally, at the end of the day, all he wanted was a better system and I credit him for making Singapore's healthcare system one of the best in the world.

Eye on the big picture, hands in the details

Dr Jennifer Lee
Chairman, Agency for Integrated Care

I WORKED with Dr Kwa Soon Bee from the time I was posted to the Ministry of Health in November 1984 till his retirement in 1996. He was very welcoming, genuinely pleased to have someone with a medical degree interested in doing administrative and policy work.

Dr Kwa had a vision of what our healthcare services in Singapore could and should be – the big picture – but unlike many senior people, he also combined this with great attention to detail.

He was passionate about restructuring our hospitals, primarily because he felt we needed to be more responsive to the rising expectations of Singaporeans. He also felt we could perform much better with a little more operational autonomy and a shake-up towards a more service-oriented mindset.

Whilst Dr Kwa had a clear vision of what he wanted, he was open to suggestions from his team. He recognised both the practicalities of pushing through whatever grand plans you wanted to implement as well as the importance of bringing the medical staff on board with you.

In my mind, this is why he was held in such high regard by both the administrators and the doctors who worked with him. Dr Kwa was a great boss to have: Supportive and most generous with his time and guidance. I have tried ever since to be the same with all the colleagues who have worked with me.

A sweeping solution would subsequently come with the announcement of the 1983 National Health Plan.

Emphasising community care

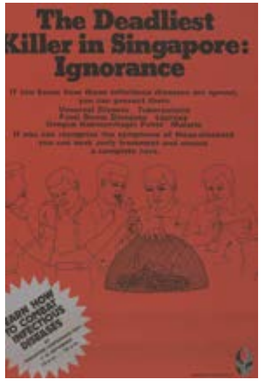
One of the moves to cope with the shortage of hospital beds was the creation of the Home Nursing Foundation (HNF) in October 1976. It began life as a Government-community partnership to care for patients with chronic illnesses at home rather than in the general hospitals. This would make healthcare more affordable for them and free up hospital beds for more urgent cases. These home nursing centres operated initially from polyclinics and outpatient dispensaries, with administration and nursing staff provided by the Government while the HNF was responsible for operating costs.

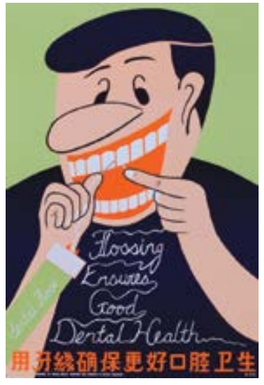
The HNF quickly proved its worth and became an integral part of the long-term community care landscape. Its nurses visited patients at their homes, providing services such as dressing wounds, giving injections, changing feeding tubes and urinary catheters. They also gave caregivers basic training on how to care for their loved ones better.

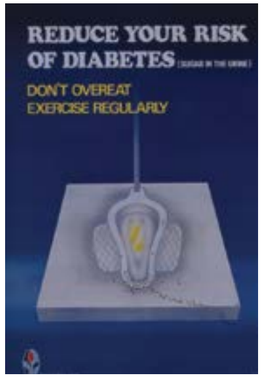
In addition, the HNF's network of affiliated general practitioners performed regular health reviews, ordered tests and prescribed medicines. Its social workers assisted the patients by assessing financial needs, connecting families to social support groups and coaching families on caring for their aged sick. Today, the HNF is registered as an independent voluntary welfare organisation and

Spray smart

Need to get some anaesthetic accurately to an unreachable spot in the nose? Just reach for this Rowbotham Anaesthetic Spray. The bottle is filled with anaesthetic solution and is sprayed into the nose by placing the metal piece into the nose and pressing the rubber pump.







▲ Poster perfect... campaigns were crucial in getting important health messages to a multi-racial population.

serves over 5,000 patients yearly, making over 30,000 home visits.

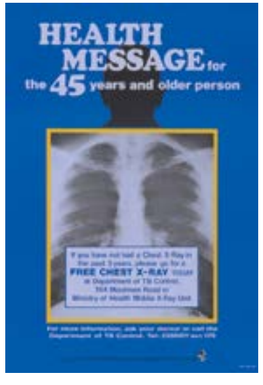
Campaigns,
a universal language

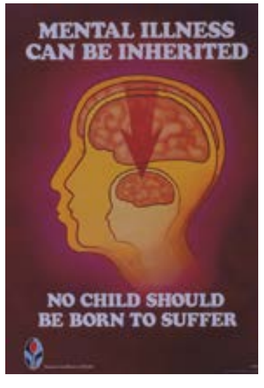
Public education continued apace in this decade. With MOH's Training and Health Education (THE) Department leading the way, the focus was now on new health issues thrown up by improved socio-economic conditions. In addition, Singapore's stature as a growing vibrant nation and its allure as a tourist destination meant a need to improve social behaviour.

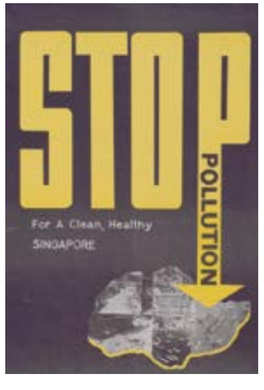
The underlying message of almost all the public education campaigns was personal responsibility, whether the campaign was by MOH or in collaboration with the Ministry of the Environment. The two ministries shared common objectives in improving public health and sanitation via public education. This cooperation scored many victories. A good example was the campaign to eliminate mosquito breeding places and thereby prevent dengue haemorrhagic fever and malaria.
The result: Singapore was declared free of malaria by the World Health Organisation in 1982.

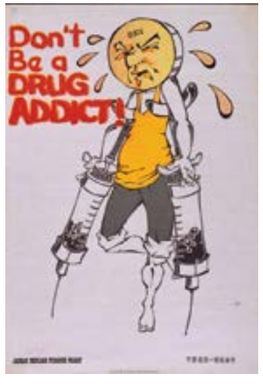
Similarly, keeping the environment pollution-free worked with the drive to eradicate cholera. Food hygiene and hand washing were seen as direct links to public health.

Probably the standout campaign that cut across public health, sanitation and economic









Dr Luisa Lee, former Medical Director, Ministry of Health's Training and Health Education Department

Doctor, medic, rainmaker

MANY Singaporeans of a certain age will recall the Two Is Enough poster which was part of the family planning campaign of the 1970s... you know, the one with two cute girls taking shelter from the rain under a see-through umbrella. But what they won't know is that I was the one standing on a ladder and pouring water on top of the umbrella even as the photographer clicked away!

It was a very hot and humid day in June, so I had to provide the "rain" even as the young girls – they were daughters of my former classmate from school – giggled under the umbrella. We even had to hunt for the umbrella, as the then Health Minister Toh Chin Chye had asked for it. He had seen a transparent umbrella overseas and suggested that we use a similar one for the campaign.

The shoot was hard work... it was not easy in those days to get this transparent umbrella with a dome shape that could cover the girls. But we managed to find one and we shot the poster. Although it was a lot of work, I had a lot of fun.

Working on this campaign came after a 10-year journey in healthcare. I was barely eight years old when an aunt very proudly proclaimed that one of her nieces had become a nurse. It made me think that I could be one too, working in a hospital and helping to heal sick people. It sounded very glamorous. But nursing was put on hold when I continued studying after my O levels. I prepared my application to the then University of Singapore to do science but, on the day before I submitted it, my cousin urged me to try medicine and I thought: "Why not?"

However, as a medical student, I would get rather depressed when patients I knew during my postings to hospitals died. That's how I ended up doing health promotion and management rather than clinical medicine. But I did make it a point to go through clinical postings so that I had a full understanding of what medicine was.

I joined the Training and Health Education (THE) Department in 1974, fresh from my clinical postings. And that's when I got involved in public education campaigns. One of them involved the family planning poster with the two girls that I mentioned earlier. We designed most of our posters in those days. We had our own artists; we had our own printing machine, which at best could only do two-colour runs. Anything that needed three or full-colour had to be taken to commercial printers. So we tried to do everything in two-colour as much as possible to save money. We didn't have much then.

We also conducted mobile exhibitions at factories, workplaces, schools and even the few remaining kampongs at the time. I recall that, even before I joined, they used to ask doctors to do a talk with factory workers who were not very fluent in English, so all our material was in four languages. When we went to rural areas with our 16mm film projector, we had to take portable screens along in case there were no proper screens. Sometimes we even used white cloth as the screen. We put the exhibits in the community hall and most of the talks were held outdoors, like at the badminton courts. We would keep our fingers crossed that there would be no rain.

Even when we did work indoors, of course there was no air-conditioning and it was really hot and stuffy. But I felt the talks and exhibitions on how to use family planning methods were very well accepted. It was all organised through the community, working with the local leaders, and the exhibitions would be officiated by the MP of the area. Sometimes the MPs were ministers.

About 1978, when I was still with THE, I found out that the Singapore Armed Forces was recruiting volunteer doctors and nurses. The nurses were the only women volunteers then so I asked the Chief Medical Officer if I could volunteer... and I was thrilled when they accepted me. I was 30 years old at the time, and I had two boys. We trained for six months, twice a week and one weekend a month. It was a crash course in military life. We learnt individual field craft (how to camouflage, identify field signals and learn target indication), military history and law.

I can still recall one incident. During a topography exercise, an older volunteer nurse and I were walking past a group of young NSmen and one of them said: "Walau, an ni lao (so old in Hokkien)!" I still laugh about it but I hope we were an inspiration.

Coming back to the Two Is Enough campaign, the bosses at THE made me the chairman of the publicity committee for campaigns. A year before I joined, they had formed the Information Education and Communications (IEC) unit and THE were overseeing this programme with staff from both units working side by side.

That iconic poster with the two girls was the first time we actually used real people for the posters. We also made a conscious decision to use two girls as the Family Planning Board had found in a survey that the average family size was 4.3 and the preference was for boys. We showed girls to diffuse this preference. We even ensured the girls had the age gap that we wanted to encourage.

Little did I realise, when hunting for the transparent umbrella and two suitable girls as models as well as pouring water on top of the umbrella, that the poster would become so iconic or that the campaign would work too well.

◄ Campaign icon... Dr Luisa Lee made it "rain" during the photo shoot for this poster, which has become the symbol of the very successful Two is Enough family planning campaign.

development was the massive 10-year clean up of the Singapore River that began in 1977. It cost $170 million and removed a major source of pollution. Some 400 squatters, as well as vegetable sellers and hawkers, along the river were relocated. The squatters moved to public housing while the vegetable sellers and hawkers went to hawker centres.

The river was dredged of the polluting waste dumped into it over the years. The hundreds of bumboats which served cargo ships and ferried goods to the warehouses along the river were moved to a new lighter anchorage at Pasir Panjang by the Port of Singapore Authority. The river, as promised by Prime Minister Lee Kuan Yew, became habitable again.

MOH streamlined its public education function by bringing the Nutrition Unit and the Dental Health Education Unit under the THE Department, and widened its scope in health education matters. The month-long National Health Campaign in 1977 reflected the growing concern about disease-causing lifestyle habits by turning the spotlight on heart disease, hypertension, diabetes, mental illness and lung cancer. People were confronted by posters with thought-provoking questions like "How close are you to a heart attack?". Others declared "Down with high blood pressure" or tugged at parental heartstrings with "A healthy heart, a healthy child".

In August 1983, the ministry also declared war on viral Hepatitis B, a disease that could lead to liver cancer and chronic liver disease. In addition to the public education effort, doctors would also vaccinate those at risk.

From family planning to
Stop At Two

The concept of family planning was not new in Singapore. The post-war baby boom and resultant large, impoverished families had made it a national priority in the 1960s and 1970s to push the message for smaller families. This was good for economic growth, housing and curbing the rising cost of providing education and healthcare services. As families did become smaller in response, the aim this decade was for population replacement, through the two-child family, regardless of gender.

Asthma aid

The Nelson inhaler, invented in the mid 19th century, was used to inhale medicated vapours. Made of earthenware with a glass mouthpiece, it was a cheap and portable inhalation device for people suffering from asthma and infections of the throat and bronchial tubes.

The messages were direct and addressed the bias for boys: "Girl or Boy, Two Is Enough". Later, a more subtle approach was used, with the "Stop At Two" campaign poster which featured two cute girls.

Dr Luisa Lee, then director of the THE department, recalls working on that particular campaign. In fact, she even used a watering can to simulate rain on the umbrella in the memorable poster (See page 88). In an interview for this book, she recalled that it was the first time that the THE used real people for the posters. She said: "Before this, the family planning posters were illustrated. At the time the message also became more specific, 'Plan for a two-child family' because the Family Planning Board found in a survey at the time, the average family size was 4.3 and there was a preference for boys." She added using the two girls as models for the campaign was a conscious decision to diffuse a preference for boys as well as show the age gap they wanted to encourage. The success of the campaign was quite unexpected and eventually proved alarming.

By 1975, the birth rate dropped to 17.7 per thousand, below the target of 18. Looked at another way, in 20 short years, the fertility rate (the number of children a woman would bear over her lifetime), had dropped from 4.66 in 1965 to 1.61 in 1985.

It wasn't just the family planning policies or campaigns that curbed Singapore's birth rate.

There were couples who wanted children but could not conceive. For them, one answer was artificial insemination. Sadly, while the queue of women grew, there was a shortage of donors. This led the head of the National University of Singapore's (NUS) department of obstetrics and gynaecology to appeal to donors to come forward and do a "worthwhile service" to help the 200 childless couples in the queue then to have children.

Better education and job opportunities had also given women greater economic independence, leading to delays in marriage, child bearing and wider gaps between children. Financial independence meant women could choose to remain single too. PM Lee triggered off the "Great Marriage Debate" when he expressed concern during his 1983 National Day rally speech that Singapore's talent pool would be depleted unless graduate women got married and had more children. To address what the Government considered a lopsided procreation pattern resulting in "a thinning of the gene pool", the Graduate Mother's Scheme was announced in January 1984. It offered graduate mothers who had three or more children top priority to register their children in Primary 1.

The series of speeches by PM Lee and other ministers on the subject and the scheme itself engendered much public debate. It met the most resistance from the very people who would benefit – graduate mothers. In fact, the women's group AWARE credits its founding to these events. Dr Tony Tan, then Education Minister, announced in March 1985 that the "contentious" scheme would be abandoned. Acknowledging the "resentment and anxiety which the scheme had aroused in Singaporeans", he said he did not think it would produce the desired results.

Urbanisation and the public housing programme did their bit in reducing the birth rate too. By the mid-1980s, some 80 percent of the population lived in public housing. Rules allowing newly married couples to apply while prohibiting subletting of flats by families with more than three children promoted the rise of the nuclear family. With the absence of grandparents, traditionally relied on for childcare responsibilities, working couples found it difficult to have more children. This was compounded by the high cost of hiring help and lack of childcare centres then. With economic progress, the role of children as family help and insurance against old age had weakened too.

In an interview for this book, Emeritus Senior Minister Goh Chok Tong said all these factors played a part. He added: "The attitude had changed and we were all quite happy to just have two. What we didn't anticipate was that many people were happy to have just one. Like today's China, many families said one is enough, Government said you still can have more but they say no, one is enough. The attitude has sunk in… and the lifestyle has changed accordingly."

Is it possible to reverse the trend? With a shake of his head, he said no. Modern forces are now at play and it may be impossible to reverse the trend.

"The average family size was 4.3 and the preference was for boys. We showed girls to diffuse this preference."

Dr Luisa Lee who worked on the "Stop At Two" campaign

Calendar entry:
Stop at two

The previous decade's message to the people of Singapore was about having fewer children. This decade saw the Singapore Family Planning and Population Board roll out a very specific message: Stop At Two. It used lines like "Please stop at two", "The second can wait" and "Boy or girl – two is enough" on posters and even gave out calendars with the same message as part of the publicity campaign.

Singapore would have to look for more creative ways to renew the population and continue as a viable, vibrant society.

Tested by crisis

The second decade of independent Singapore saw rapid growth in the nation's hospital infrastructure and development, medical services and education, including specialisation.

MOH had entered the 1970s with three additional hospitals handed over by the withdrawing British troops, all for token sums of $1 each. The British Military Hospital was handed over in June 1971 and renamed Alexandra Hospital. It was opened to the public in September the same year.

This was followed by Sembawang Hospital in September. The hospital served patients from Toa Payoh Hospital who needed extended stays but was eventually closed in March 1983 under the provisions of the 1983 National Health Plan which called for demolition, rebuilding or relocation of

$1

Token sum paid by Singapore for the British Military Hospital when the British troops withdrew in the 1970s. It was renamed Alexandra Hospital in June 1971 and opened to the public a few months later

Professor Lee Seng Teik, Emeritus Consultant, Department of Plastic, Reconstructive and Aesthetic Surgery, Singapore General Hospital

Lessons from the Spyros disaster

I WAS having tea with a visitor from the United States in our head of department's office when the chaos started. Patients with severe burns were arriving at our Burns Unit in Singapore General Hospital (SGH), literally by the lorry load. We rushed out and immediately started work on them. All of them were burnt and covered in oil, some of them burnt beyond recognition.

Even though it was 37 years ago, I can remember it vividly.

Nobody informed us at that time about the extent of the disaster on the Greek oil tanker S.T. Spyros. All we heard was that there had been an explosion on a ship. Not that it mattered... we just started work on saving the patients even as we cleared as many beds as we could in the Burns Unit to accommodate the new arrivals. At that time, our capacity was 40 beds.

In addition to treating the patients, we also had to identify them. This was important because there were so many of them. Out of the 50 that were brought to us, 10 were very severely burnt. We had to do triage, because if they were burnt to that extent, all we could do was keep them pain-free, keep them comfortable. Those 10 died within 24 hours.

We also had to deal with patients who had inhalation burns; they had breathed in smoke and fumes and some of them had aspirated some oil, where the oil had gone into the lungs. This was beyond the care of the Burns Unit, so we had to mobilise people from other units like intensive care.

Another thing we had to deal with was the crowd. I can well remember the crowd of relatives outside our Burns Unit in the old Norris Block where the department of plastic surgery was sited. It was like the servants' quarters of a "black and white" house. Crowd control became such a major problem that the police had to get involved.

Furthermore, there were people from the Ministry, the health minister... everyone wanted to check on the situation. We had to cope with relatives and important visitors. We never left the hospital until things stabilised. It was a continuous three days. I never went home, I never bathed.

At that time, Dr Wong Kum Leng was in charge of the Burns Unit, which had been set up under the department of plastic surgery when it was formed in 1972. Before that burns patients were handled by everyone... orthopaedic, general surgery. But now burns had come under the practice of plastic surgery as it was in the UK and the US.

Dr Wong had to do so much public relations work, in addition to his medical duties. He had to attend to queries from the media and the Ministry. The rest of us – Dr Ng Chin Lin, Dr Chan Chee Chin, a couple of medical officers, nurses and me – found it very tough to handle the situation. It is something we don't want to live through again if possible.

But what came out of that disaster on Oct 12, 1978 was a realisation that we had to be better prepared for such emergencies. At the time, the new SGH was being built and we were given two wards – 38 beds in each ward – and told to make the Burns Unit better equipped to deal with situations of the magnitude of the Spyros disaster. So Dr Wong and I worked on it. One of the things we did was create viewing corridors, so patients who needed to be in an infection-free setting had no contact with visitors, but could still see them and communicate with them. We also felt we didn't need 76 beds so we condensed the wards into 54 beds, which still made it one of the largest Burns Units in Asia at the time.

We had our own laboratory inside so we could do investigations that helped with treatment of severe burns patients; we didn't have to send the specimen to the pathologist.

The most beautiful thing we started was our skin culture laboratory, which initially used to be in the department of clinical research. Even as plans for this were being formulated, I went to Harvard University in 1989 as part of my sabbatical, to learn about skin culture and bring back the expertise.

We also invited one of the experts from Harvard to help set up the skin laboratory. In 1990, we grew the first piece of skin in the laboratory that could be used on burns patients.

By the 1990s, we were already the top Burns Unit in the region. We receive the major burns victims from disasters that occur in the region, like the 2002 Bali bombing. Locally, we used to treat about 200 patients a year. Now, thanks to the safety campaigns, that number has dropped; it is a trend we see in all developed countries. That said, we will always have burns, accidents and trauma.

This year is Singapore's 50th birthday. And it is also a special 50 for me; 50 years of practising medicine as I qualified in 1965. I am very proud of what we have accomplished. I am happy to retire now.

► **Trauma relief... victims of the 1978 explosion on the Greek tanker S.T. Spyros were taken to SGH for treatment. It was a turning point for the hospital's fledging Burns Unit.**

uneconomical or poorly located hospitals.

In December 1975, the UK Military Hospital in Changi was renamed the Singapore Armed Forces Hospital and used to provide free medical care for Singapore Armed Forces personnel and their families. The following year, it was merged with Changi Chalet Hospital, which comprised an Upper Block at Halton Road and a Lower Block at Turnhouse Road serving mainly local holiday makers, to become Changi Hospital.

In the midst of all these changes, the hospital system faced some of its most memorable tests, with lasting legacies even to this day. In October 1978, Singapore experienced its first post-war disaster when an explosion on the Greek tanker S.T. Spyros left 76 people dead and injured another 69. The lessons learnt from scrambling to deal with horrific burns sustained by the victims led to the setting up of the Burns Unit in the Singapore General Hospital (SGH).

Prof Lee Seng Teik, who was instrumental in setting up the Burns Unit later, still remembers that terrible day when he and his small team of doctors at SGH had to treat the victims of the Spyros accident.

In an interview for this book, he said: "We didn't

76

Number of people who perished in the deadly Spyros disaster in 1978

"We didn't go home for three days. We didn't bathe. It was terrible. All we did was to treat the victims who came in. What came out of that disaster was the development of the Burns Unit. The hospital administration gave us two wards, with a total of 76 beds and told us to plan and design it."

Prof Lee Seng Teik who treated the victims at SGH

go home for three days. We didn't bathe. It was terrible. All we did was to treat the victims who came in. What came out of that disaster was the development of the Burns Unit. The hospital administration gave us two wards, with a total of 76 beds and told us to plan and design it."

Mental health services were also reaching significant milestones during this decade. Perspectives on the topic among medical practitioners and the public had evolved rapidly – from avoiding negative labels like lunatic asylums to providing tailored care for patients at different stages of their illness. Treatment was also moving away from the custodial care of old to rehabilitation and community-based or home-based care. With better education and understanding, the stigma attached to mental issues was lessening too.

Sub-specialisation in psychiatric care was expanding as well. In April 1970, MOH opened a child guidance clinic to cater to children and adolescents with psychological and emotional disorders, operating out of an old bungalow on the grounds of SGH. After the roof collapsed in January 1971 (not the first time such a thing had happened in the very early days of Singapore healthcare!), the unit moved. In 1982, it opened a child psychiatric inpatient unit in Woodbridge Hospital for the management of teenagers and older children.

Another milestone in mental health was reached when the first community-based day centre, the Mandalay Day Centre, was opened in January 1981, followed by the Alexandra Day Centre in April 1983.

The focal point of mental healthcare, Woodbridge Hospital, had also evolved, especially with the shifting emphasis to rehabilitation and reintegration into community life. However, the ageing hospital – it was built in 1928 as the Mental Hospital – was not designed or equipped to provide modern psychiatric treatment. Nor could it handle the growing number of people seeking care. Instead, it occasioned much apprehension in the public mind and was the butt of wisecracks about mental illness with its formidable iron-barred doors and windows. Planning for a new hospital began in 1984. (In 1993, Woodbridge shifted into its new premises at Buangkok Green and was renamed the Institute of Mental Health/Woodbridge Hospital).

The role of the mental health services also increased following the collapse of the Hotel New World in March 1986. It was Singapore's worst civil disaster in Singapore since the Spyros explosion. Singaporeans were fixated on the dramatic five-day inter-agency search and rescue operation. Thirty-three people died and 17 were rescued. Hundreds went to SGH in response to calls for blood donors. In those crucial days, staff from Woodbridge Hospital and voluntary groups provided swift and spontaneous psychological and emotional support to survivors and families of the victims. Even the rescuers needed similar support due to the danger and tension of the rescue work.

The disaster led to significant changes in Singapore's disaster preparedness plans and capability. Public healthcare played its part. The major hospitals were involved in simulation exercises to handle major civil disasters, like Operation Vulcan in 1993. The role of trauma support was formalised in the National Behaviour Management System, announced in October 1997. It grouped more than 200 trained emergency behaviour officers who would provide swift assistance to disaster victims, their relatives, rescuers and even those who witnessed the disaster.

Far less dramatic but just as significant, primary healthcare facilities and services continued to improve during this decade.

Work on building Ang Mo Kio Polyclinic began in the middle of 1979. Catering to the growing population of this new town, it was equipped with X-ray machines and facilities for minor surgery. Similarly, the growing population in Toa Payoh sparked work on the new Toa Payoh Polyclinic in October 1983. It was designed with, as a pilot, a spartan 40-bed mini hospital which would provide intermediate care between that of a polyclinic and a general hospital.

MOH was on the move too, literally. On 5 November 1978, a fire broke out soon after midnight in the empty attap huts behind MOH's three-storey building in Palmer Road. Four fire engines battled the hour-long blaze which eventually destroyed the rear portion of the first two floors. Later the same morning, MOH announced that it would operate temporarily out of the Institute of Dental Health at Hyderabad Road from 7 November. The Ministry moved in 1979 to the now defunct Cuppage Centre. Eight years later, it shifted to its current location at the College of Medicine Building (COMB) in the Outram campus.

The historic building had received a new lease of life in 1982. That year, it was decided that the Faculty of Medicine and School of Postgraduate Studies would move to the new NUS campus being built at Kent Ridge. The Ministry wanted the old medical school building to have a place in Singapore's medical history and, in 1983, the Preservation of Monuments Board recommended its preservation. The adjacent Tan Teck Guan Building, which housed the Department of Anatomy of the medical school and a pathology museum, got the same status two years later.

Restoring the building to its former glory took some imagination. Mr Lawrence Lim, then Director of Development in MOH, oversaw the restoration project. He said: "We (MOH) were then at Cuppage Centre. We saw the building (COMB) before anything was done to it. The university was still occupying it then. It was like a rabbit's warren; you don't know where to go."

In the auditorium, the team found that a fake ceiling hid the original one which had been damaged by fire. The architects took a mould of the original coffered ceiling and used it to reconstruct a new one. A grand staircase, which was in the original plans but never built, was added.

There was an air of optimism in the public healthcare community during this decade. Singapore was being positioned as a regional medical centre. Strides were being made in training, education and specialisation. Modern facilities – the new Kent Ridge Hospital being built and SGH was being redeveloped – were taking shape under the Government's 1971 masterplan to redevelop Singapore's hospitals within a 20-year timeframe.

PM Lee had thrown the gauntlet to the medical community to make Singapore a "regional centre for specialist medical treatment with its resident specialists backed by regular visits of outstanding practitioners". Both hospitals would boost bed capacity and services, as well as provide medical training.

SGH, from its early days as a tumbledown shed at Pearl's Hill, had seen a pattern of demand outstripping its facilities and its last makeover had been in 1929. Dr Kwa Soon Bee, Medical Superintendant of SGH and chairman of the Hospital Planning Committee, promised that the new SGH would be "very much larger and far more comprehensive and staff will have amenities of a standard not previously provided in Singapore". It would also house all the major specialities being developed under the masterplan and continue its teaching role for undergraduate and postgraduate medical training, nursing and paramedical education.

The foundation stone for the new state-of-the-art building was laid in 1975 and the new hospital was opened on 12 September 1981 by PM Lee.

▼ Caring for the injured... even as victims of the Hotel New World disaster were rushed to hospitals, some healthcare workers provided immediate care at the site too.

▲ Looking ahead… the excitement was palpable as SGH nurses viewed the architectural model of their upcoming place of work. The revamped SGH was opened by PM Lee on 12 September 1981.

Dr Edmund Hugh Monteiro, former Director, Communicable Diseases Centre

Father-son combination fought polio and AIDS

IT IS all part of Singapore's medical history now, but my father, Emeritus Professor Ernest Monteiro, had to overcome a few hurdles to introduce the oral polio vaccine here in 1962.

He wanted to use the "trivalent oral polio vaccine", developed by Professor Albert Sabin in the United States, to vaccinate the children in Singapore. The vaccine had a mixture of live, attenuated (weakened) poliovirus strains of all three poliovirus types – Type 1, Type 2 and Type 3 – and produced antibodies in the blood to all three types of poliovirus. In the event of infection, these antibodies would protect against paralysis by preventing the spread of wild poliovirus to the nervous system.

Dr Sabin was experimenting with it in a small way but it had not been tried out on a large population in the US. So, my father had to convince his colleagues like Professor J.H. Hale, Professor Lim Kok Ann and Dr Muthiah Doraisingham who was Director of Medical Services and Permanent Secretary at the Ministry of Health (MOH) at the time. He had to get their support. They trusted him, trusted his judgement but the main issue was whether vaccinating a large population with Dr Sabin's vaccine was scientifically sound.

Soon after his meeting with his colleagues, they had an alumni meeting, which I attended. To my surprise, the doctors at the meeting could not catch my father's explanation. They felt they should use a polio vaccine to match the polio type. My father had to get through a lot of arguments with the medical community. But he pushed ahead nonetheless, especially since he wanted to get the vaccine out to the community.

My father was very concerned about safety too. If things went wrong, this was after all Singapore's children you were giving this vaccine to, everyone was going to point the finger. My father called Dr Sabin in the US and got the vaccines shipped to Singapore. As things turned out, it worked beautifully. The oral polio vaccine did block the virus.

I too got a taste of what it is like to be doubted as a physician. When I completed my medical studies in 1960, I was posted to various hospitals like Singapore General Hospital (SGH), KK Hospital (now known as KK Women's and Children's Hospital), Tan Tock Seng Hospital (TTSH) and eventually Middleton Hospital in 1964.

Middleton Hospital became the Communicable Diseases Centre (CDC) in 1985, and a part of TTSH, as a result of the smaller number of infectious diseases in Singapore. There were no more smallpox cases and typhoid numbers had gone down significantly.

Then, in 1988, I received a letter from the MOH that said we were nominated as the receiving and treatment centre for all HIV/AIDS patients. That was the beginning of my work with AIDS.

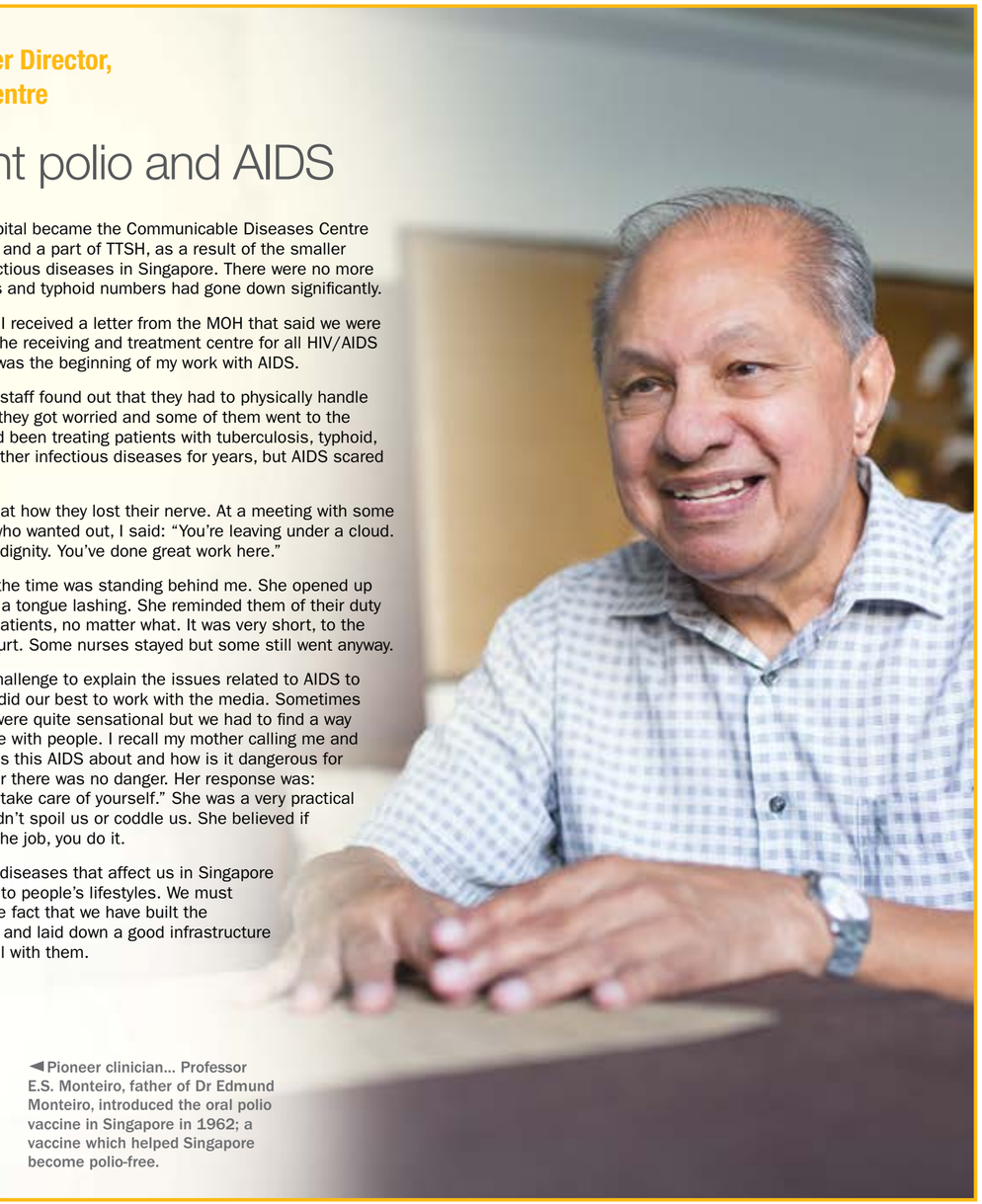
When the CDC staff found out that they had to physically handle AIDS patients, they got worried and some of them went to the union. They had been treating patients with tuberculosis, typhoid, smallpox and other infectious diseases for years, but AIDS scared them.

I was at a loss at how they lost their nerve. At a meeting with some of the nurses who wanted out, I said: "You're leaving under a cloud. Please go with dignity. You've done great work here."

The matron at the time was standing behind me. She opened up and gave them a tongue lashing. She reminded them of their duty to serve their patients, no matter what. It was very short, to the point... but it hurt. Some nurses stayed but some still went anyway.

It was also a challenge to explain the issues related to AIDS to the public. We did our best to work with the media. Sometimes the headlines were quite sensational but we had to find a way to communicate with people. I recall my mother calling me and asking: "What is this AIDS about and how is it dangerous for you?". I told her there was no danger. Her response was: "Okay, you can take care of yourself." She was a very practical woman; she didn't spoil us or coddle us. She believed if this went with the job, you do it.

Nowadays, the diseases that affect us in Singapore are due mainly to people's lifestyles. We must appreciate the fact that we have built the expertise and laid down a good infrastructure to deal with them.



◄Pioneer clinician... Professor E.S. Monteiro, father of Dr Edmund Monteiro, introduced the oral polio vaccine in Singapore in 1962; a vaccine which helped Singapore become polio-free.

It cost a total of $270 million – $180 million to build and another $90 million to equip with the latest medical devices.

The sobering realities of the end of cheap oil, brought on by the second oil shock of October 1979, and its global impact on costs, threw a damper on the opening celebrations. PM Lee dropped a bombshell with his first sentence "I open this hospital with mixed feelings". He praised it as a "handsome well-designed hospital with excellent facilities" but then levelled several criticisms.

His sternest remarks were aimed at costs. The oil shock had rendered the assumptions of SGH's quality invalid. The design, he said, was "lavish with total air-conditioning".

"If the administrators, doctors, and architects had understood the Cabinet's fear of higher and higher oil prices, there would have been wide-scale cuts in the air-conditioning," he said. "The result is costly and will get costlier every year."

Perhaps alluding to talk that SGH would be rebuilt as a "premier hospital" – a perception Minister for Health Toh Chin Chye had tried to dispel in 1977 – he said its foyer was "posher" than private hospitals like Mount Elizabeth and Mount Alvernia. Characteristically, PM Lee's concern was to ensure that publicly-funded buildings were appropriately furnished and equipped but without unnecessary frills, to avoid burdening the taxpayer.

PM Lee's comments are still remembered today but the "handsome well-designed" hospital continues to serve as the people's hospital. It even got a $10 million upgrade 12 years later.

The drive for quality

Medical specialisation had already gained momentum with Dr Toh Chin Chye's support in the earlier decade. As Deputy Prime Minister he had been very clear about the need for more doctors to be trained locally. He also wanted them to be recognised on par with those from traditional bastions of medical learning such as Britain and Ireland.

The Academy of Medicine had responded actively. By 1979, it had instituted a specialists' roll to

$270 million

Cost of building the new state-of-the-art SGH which was opened by PM Lee Kuan Yew in 1981

register members who fulfilled the criteria for certification. The Government further augmented specialist training by introducing the Healthcare Manpower Development Plan in 1980. It provided funds to deepen and widen expertise by sending promising doctors and nurses overseas for sub-specialisation training. It could also be used to invite foreign experts to teach and train doctors in Singapore.

The nation was also evolving a strong regulatory environment to ensure that high standards in medical ethics, practice and products were set. One piece of legislation – the Medical (Therapy, Education and Research) Act, an opt-in scheme for people willing to donate their organs for research after their death – had been put in place in the previous decade.

This decade saw the introduction of the Medicines Act (1975) to regulate the safety and quality of medicinal and related products, and the Infectious Diseases Act (1976) dealing with prevention and control of diseases. The Pharmacists Registration Act was passed in 1985 to uphold professional standards in the sector and provides for complaints of misconduct to be investigated.

Legislation covered standards in private practice too, with the Private Hospitals and Medical Clinics Act being passed in 1980. It required all private healthcare facilities to be licensed to ensure minimum standards of care and hospitals had to set up Quality Assurance Committees. The Act empowered MOH officials to inspect the premises of private healthcare including private hospitals, nursing homes, maternity homes as well as clinics run by doctors, dentists and acupuncturists. The aim was to ensure compliance with minimum standards.

In pushing the Act through Parliament, Dr Toh encountered criticism that it would make things difficult for private sector doctors and that it was intended to stem the brain drain of doctors to the private sector. He said it was meant to protect patients and their rights, as public hospitals often treated high-risk patients and those who had been mismanaged in the private hospitals. He also took a dig at The Straits Times for being unfair in its reporting, covering up complaints against private hospitals which he had been copied on, while publishing those against public hospitals.

There were choppy waters elsewhere too for MOH during these eventful years. In May 1978, it became mandatory for non-scholars embarking on medical and dental studies to sign a bond to serve the public healthcare sector for four years after their one-year housemanship. The bonds were worth $81,000 and $20,000 respectively. Second- to final-year students would be bonded too for the same sums. The time they would serve in the public healthcare sector varied according to their year of study at the time.

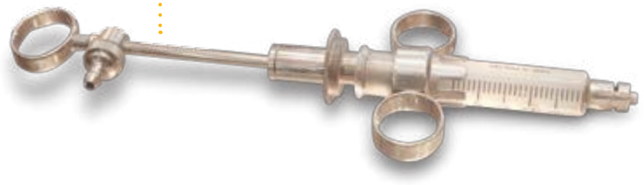
This caused controversy. Some students objected to the "high-handed" way in which the bond was applied. Final-year students wrote to MOH's Permanent Secretary Andrew Chew, stating their refusal to sign the bond until terms they felt were ambiguous were made clear. The Prime Minister then hinted at legislation to enforce the bond. The impasse lasted for four months until Dr Toh met the students to offer a compromise. Final-year students could opt to sign the bond or sign a binding undertaking to work in public healthcare after their housemanship year. If they failed to do so, they would be deregistered and be unable to practise in Singapore. The undertaking was eventually given the force of law when the Medical Registration Act was amended in May 1979.

Another hiccup occurred when the Singapore Dental Association (SDA) threatened to take the Labour Ministry to court in January 1983. This was prompted by the latter's proposal to conduct a survey that assessed if dental clinics should be registered as workshops under the Factories Act of 1973. The reasoning was that dental clinics had work areas where dentures were being made and were equipped with air receivers, tanks which store pressurised air to drive the dental drills.

The SDA felt dental clinics should be treated as medical laboratories as they were already governed by the Dentists Registration Act. Nevertheless, the Labour Ministry had its way and all dentists had to register their clinics under the Act by April 1984. SDA president Oliver Hennedige was charged with using his clinic in Tanjong Katong as an unregistered factory in June 1983.

Dental syringe

About 30 years ago, before the advent of modern disposable syringes, dentists used glass syringes with graduated marks that indicated the volume of fluid in the syringe, to inject their patients with anaesthesia during a dental procedure. These glass syringes were sterilised in an autoclave after every use.



The quest for quality in education, training and practice continued to be vindicated by the medical breakthroughs recorded in Singapore during this period. Pioneering doctors broke new ground in medicine, aided by the acquisition of new technology and equipment.

To name just a few of the more celebrated ones, the first coronary artery bypass was done at TTSH in 1976 and SGH performed the first two living-related renal transplants a year later, leading to the future success of the living-related donor transplant programme.

Professor S.S. Ratnam, who started the In–Vitro Fertilisation (IVF) programme in 1982 in Kandang Kerbau Hospital, delivered Asia's first IVF baby in May 1983. (See article on Samuel Lee "Yes, I'm man-made but all babies are miracles" on pages 112-113). Singapore's first successful bone marrow transplant was done in SGH in November 1983 on two 12-year-old boys suffering from leukaemia. The visiting Israeli doctor who performed the procedure was training a select group of local doctors. An all-Singapore team in SGH quickly followed up with a successful transplant on a three-year-old girl, thereby also establishing SGH's paediatric bone marrow transplant programme.

The National Health Plan

Even as Singaporeans were enjoying big improvements in quality of life and the medical sector notched up achievements that enhanced the nation's healthcare capabilities, it was time for the Government to take stock. Given that costs and expectations were rising in tandem, the roles of the Government and the people in financing healthcare had to be looked at too.

The Government had been consistent in emphasising shared responsibility between itself and the individual, to prevent unnecessary or over-consumption of medical services. The British model of state-financed free healthcare for all had its drawbacks. It put too much strain on government funds, for which there were many competing demands. The fee-for-service, insurance-based model had drawbacks too.

▲Test results… Prof S.S. Ratnam carrying baby Samuel who made history in 1983 as Southeast Asia's first test-tube baby while mum Madam Tan Siew Ee looks on with pride.

It meant only the well-off could afford healthcare.

In fact, the concept of shared responsibility had been introduced in the 1960s when a 50-cent charge was levied on patients at clinics. Then, in May 1981, the new Health Minister Goh Chok Tong pointed the way forward in his landmark "cradle-to-grave" speech.

Speaking at the Singapore Medical Association's annual dinner, he said: "There is no place for a cradle-to-grave welfare health system in Singapore. Such a system is politically motivated and disregards the basic truth that resources are finite in terms of funds, doctors, nurses and other supporting staff. It blunts the population's incentive to work – so necessary to pay for the services they want. Our primary responsibility is to provide good basic healthcare to the population at a price that even the lowest income group can afford."

In February 1983, sweeping changes came in the form of the National Health Plan. It was aimed at building a "healthy, vigorous, active and physically fit population" based on the wisdom that prevention is better than cure. So while the Government would focus on preventive medicine and health education, the individual would be motivated to take care of himself through education and incentives.

There were two major prongs – a revised healthcare financing system and restructuring of the public hospitals.

▲Plan for better health… leveraging on shared responsibility between the individual and the Government, the National Health Plan of 1983 aimed to ensure affordable healthcare for all Singaporeans.

Yun Yit Siong, former Housekeeper at the School of Nursing and now Hospital Attendant at the Singapore General Hospital

The one with the golden tag

I KNOW that sounds grand, but that's how the cleaners of the inpatient and outpatient wards at Singapore General Hospital (SGH) refer to me nowadays. Whenever I go in to check on their work, I can hear them alerting each other saying "那个金牌来了". In English, that means "the one with the golden name tag is here". I hope it's not just because of the colour of my name tag (star performers at SGH are given gold-coloured badges)… but also because of my attention to detail.

All this is a far cry from when I started work at SGH over 50 years ago… on 21 August 1962, to be precise. Before that I worked as a hairdresser for eight years but the long hours prompted my elder sister to force me to look for another job. We sought help from our Member of Parliament, Dr Goh Keng Swee, for a letter of recommendation for me to join the healthcare sector and it got me an interview with SGH.

That said, I almost didn't get the job as the interviewers thought I was in my teens, they thought I was 16 or 17. But when I reassured them that I was 22, they hired me as a healthcare attendant in the A&E department. But I didn't like the job of washing needles and other hospital instruments and wanted to resign shortly after. That's when they offered me a role to help out in the kitchen at Vickers' House, the hostel for trainee nurses at the School of Nursing (previously known as Preliminary Training School).

But I had problems there too! Due to my small size, I found it hard to handle the bulky and heavy crockery and cookware, in addition to the tedious job of having to serve several meals a day to the trainee nurses. In those days, trainee nurses were given six meals a day: Breakfast at 6am, morning tea at 10am, lunch at noon, afternoon tea at 3pm, dinner at 6pm and night snacks at 9pm. When I told my supervisor that I was struggling with these tasks, she posted me to the Sisters' Quarters (which housed practising nurses) to be in charge of linen inventory.

Thanks to the constant guidance from my matron, I settled in despite my lack of experience and inability to communicate in Malay (Malay was the common language those days). I even went for Malay language classes outside of work. I stayed with this department until 2013, even though Vickers House closed down in 2010 to make way for the new National Heart Centre. In 1995, when my supervisor in the linen department retired, I was promoted and took over the running of the linen department.

It wasn't easy to earn the respect of the nurses. During those days, nurses hailed from various Asian countries such as Myanmar, Philippines, China and Malaysia. As the Sisters' Quarters was for qualified nurses, many of them were more demanding and some even disregarded the house rules. I realised that it would be impossible to maintain order without being impartial and strict, so I opted to operate by the book, making no distinction between race, nationality or seniority.

I did not hesitate to tell nurses off on issues such as letting boyfriends into their rooms or using the computer room at the upper level, as it was reserved for doctors. But I wasn't unreasonable. While their rooms were off-limits to males, I did not object if the nurses were with their boyfriends in public areas such as the multi-purpose hall. Of course, to ensure the rules were followed and there was no compromise on nurses' security and privacy, I even installed a CCTV to capture movements in and out of the hostel.

However, I also made it a point to not over-react when some nurses spoke to me rudely or complained to my superiors about my strictness. In fact, I'd like to think that most of the nurses saw it as my strong sense of responsibility which made them feel cared for and protected. Why else would some of them fondly call me "aunty mummy"? Many of the nurses who lived there came back to visit me even after they had moved out. And when the Sisters' Quarters closed, some of the nurses held a party for me.

In 2014, when I was admitted to the hospital, one of the nurses I had taken care of in the past took it upon herself to pay special attention to me. She even bought me a new set of face towels, a toothbrush and toothpaste, as well as some biscuits so that I could have a comfortable stay.

That, to me, is more precious than the golden name tag, although I do appreciate that as well. In fact, at 75, I still cherish the 30-plus awards, appreciation letters and notes from doctors and nurses throughout my career.

◄ Golden mettle… Madam Yun in her younger days, running the School of Nursing's linen department, where she had a formidable reputation for being very strict with the nurses.

The revisions to the healthcare financing system worked on the principles of equitable distribution of benefits and providing good basic healthcare to the population at an affordable price. The Plan was succinct in detailing the rising cost of healthcare and the solutions needed. The health budget had risen fourfold between 1971 and 1981, from $59 million to $257 million. Salaries made up 80 percent of costs as healthcare was, and still is, a labour-intensive sector. And there were competing claims for Singapore's "limited land, human and financial resources" while costs would continue to rise.

Hospitals and polyclinics were to be upgraded and new ones, equipped with sophisticated equipment, built at unprecedented cost. The new SGH had just been rebuilt at a cost of $270 million and opened in September 1981. Work on the new Kent Ridge Hospital (today's NUH) started in the same month. The bill for it would be $300 million by the time it was finished in 1985. Other sites in new towns were earmarked for new general hospitals.

Primary care would be provided by modern polyclinics. There would be one for every new town, bringing primary care under one roof by integrating the MCH, dispensaries and school health services. Community hospitals were proposed as an intermediate alternative to the high cost of acute care for people whose need for treatment fell between primary and acute care. The aim was to ensure cost-effectiveness for patients as well as free up beds and resources for patients needing the sophisticated treatment provided by the general hospitals.

The Plan also projected increases in manpower – better trained, more skilled doctors and nurses – for the expanded facilities and to cater to the chronic sick and an ageing population. It is interesting to note that nursing faced the same issues then as it does today. Not enough school leavers were opting for the career although pay scales had been adjusted.

An expanded role was envisaged for private healthcare too, the thinking being that it would give more choices to people.

The principle of co-payment and personal responsibility for health was enshrined in Medisave (the term was coined by then MOH Permanent

$257 million

Singapore's health budget in 1981. It had risen fourfold from $59 million in 1971

Secretary Andrew Chew), the new compulsory national savings scheme for healthcare. It required individuals to save a part of their monthly CPF contribution in the Medisave account. Recalling the momentous change that Medisave represented – momentous because it formed the bedrock of Singapore's present public healthcare financing structure – Mr Goh, now Emeritus Senior Minister, said in his January 2015 interview for this book that three critical issues dominated the debate on healthcare financing at the time.

The first was providing healthcare on demand, or welfarism, which was the British model. This was deemed untenable as it would have ignored the behavioural aspects of healthcare provision and, instead, encourage over-consumption. The second was that welfare spending would blunt the initiative of the people to work and would create a temptation to raise spending for political ends. Third, the old model would be a "bottomless pit financially when there was no limit to one's health needs". The key tenets were to "make healthcare affordable and attractive… to make sure demand did not run out of hand" and personal responsibility.

With all government hospitals covered by the Medisave scheme in 1984, it was extended to private hospitals – American Hospital (now Parkway East Hospital), Gleneagles Hospital, Mount Alvernia, Mount Elizabeth Hospital and Thomson Medical Centre – at the beginning of 1986.

The second major prong of the National Health Plan dealt with reorganising the public healthcare sector to introduce competition, greater efficiency and responsiveness to public need. The overarching mandate was to ensure healthcare was affordable to all Singaporeans.

Public hospitals would be restructured. This meant giving government hospitals the autonomy to run their day-to-day operations like private entities, while MOH still watched the big picture. The rationale was that the competition would encourage more efficiency, flexibility and nimbleness. The eventual aim was to develop better care for patients and keep control of costs.

As with all plans, the restructuring policy occasioned its fair share of public debate. There was concern about the possibility of unbridled competition between hospitals and its possible consequences for patients and for the hospitals. It was feared that the best medical professionals could be drawn to the larger and more established hospitals.

It was feared too that the common perception that better care must necessarily be more expensive would lead to spiralling bills for patients. It was even debated whether physicians and specialists would order more, sometimes unnecessary, investigations as these would generate more income. Hospitals would be tempted to order ever more sophisticated and expensive equipment in order to brand themselves. In addition, there were political sensitivities to consider as the governments of the region could have reacted adversely to their own medical services being perceived to be second best as their richer citizens opted to be treated in Singapore.

The hospital restructuring story would unfold in the next decade, with the first one, the new Kent Ridge Hospital, scheduled for completion in 1985. So too the revamp of the healthcare financing system. Medisave was the first of the 3Ms to be introduced. In the next decade, two more Ms would be implemented – MediShield, a low-cost catastrophic illness insurance scheme, and Medifund, an endowment fund the Government would set up to help the needy pay for medical expenses.

That the provisions of the 10-year plan gained acceptance could be put down to the trust that existed between the people and the Government. People understood that the needs for healthcare had to be balanced against those for defence, infrastructure and education, said Mr Goh.

He said: "Having come from a poorer past, the population understood the meaning of self responsibility because family is very much the focal point – the centre of any unit. While there were some pressure and complaints, generally people appreciated that health must be personal to them.

"Singaporeans trusted the Government as it had established a good track record of decisions that served the people. Open public debate was good too as it showed that decisions were made in a transparent manner. People also understood the need for personal responsibility."

Then, with a laugh, he added: "At that time, I think we still had to carry over from the earlier days where older people were reluctant to go to the hospitals. Hospitals… no, won't go. They were so fearful of some hospitals. Traditional Chinese medicine and Malay medicine were still very much in practice by the people. So it was much easier to get the message across."

▲ Promising a better level of care… the model of the new Kent Ridge Hospital, the first restructured hospital which would have autonomy over its operations to maximise efficiency and offer high quality, affordable healthcare.

HOME

Cut out and keep

Medisave made easy

Answers to some common questions on the new health scheme which starts tomorrow

Compiled by BENG TAN

Banks alerted on man with 'irregular' money deal

Presentation

Schoolgirl suffers fracture in attack

Meet Medisave

The Medisave scheme was the world's first compulsory health saving scheme, based on the principle of shared responsibility for health between the individual and the Government. Launched on 1 April 1984, it set aside a portion of each person's Central Provident Fund contribution in the Medisave account, to be used for hospitalisation bills if the need arose. To help the public understand how Medisave works and how to use it, a simple "Cut out and keep" guide was published by The Straits Times to answer the most commonly asked questions about the scheme. Less than three days after the launch, 364 opted to use Medisave.

I, as a member of the dental profession, solemnly pledge to:

practise my profession with conscience, honesty and integrity;

uphold the honour and noble traditions of the dental profession.

Extract from the Dentist's Pledge, recited by every dentist registered by the Singapore Dental Council since 2004. The pledge comprises the basic code of conduct and ethical principles all dentists in Singapore must abide by.

Let's stay healthy together… launching the Great Singapore Workout in 1993, Prime Minister Goh Chok Tong led a record-breaking 26,107 people in the mass workout at the Padang.

4

Taking responsibility

Cornerstone of public health

1985 - 1995

This was a decade that saw Singaporeans enjoying better health and healthcare. Despite an economic recession in the mid-1980s, the Singapore economy quickly bounced back. The fast-growing economy bolstered rapid improvements in public health, sanitation and housing.

It was also a decade which saw the Ministry of Health (MOH) implementing capacity expansions and fundamental reforms of healthcare policies, starting with the National Health Plan unveiled in 1983. MOH's objectives were twofold – cost containment and shared responsibility. This was all part of the continuing drive to build a healthy nation by providing quality yet affordable healthcare.

Market competition was used to maximise efficiency. Public hospitals were restructured and given the freedom to operate like private entities. The aim was to let competition drive efficiency and quality improvement.

A culture of shared responsibility to ease the burden on the state was fostered through reforms to healthcare financing. Working on the philosophy of personal responsibility and shared costs with the Government, the 3Ms were introduced: Medisave, MediShield and Medifund. Health promotion and disease prevention were identified as cost-effective measures to contain ballooning costs. People were expected to take ownership of their own health and adopt a lifestyle that kept them healthy and less reliant on medical care.

However, it was also a time to deal with new challenges. In particular, the declining birth rate, the prospect of an ageing population and changing disease patterns arising from growing affluence, also received significant attention.

Expanding
for growing needs

The massive programme to expand public health infrastructure began in the 1980s as laid out in the 1983 National Health Plan, and lasted 20 years.

The plans proposed that community hospitals be built in new Housing Development Board (HDB) towns as low-cost alternatives to the general hospitals, as most patients did not need highly specialised care. Older hospitals and dispensaries which were not economical would be phased out, such as the Sembawang Hospital in December 1982. Others would be renovated or rebuilt. Polyclinics were also planned for every major HDB town. Work proceeded rapidly.

In 1986, plans were announced for 10 new polyclinics in Toa Payoh, Jurong, Hougang, Tampines, MacPherson, Bukit Batok, Yishun, Woodlands, Choa Chu Kang and the last near Singapore General Hospital (SGH). They would provide more holistic care and one-stop convenience to the communities they served. In addition to primary medical care, they offered preventive healthcare services such as cancer screening. Early screening programmes would also be introduced to detect womb and breast cancers.

The blood bank run by the Singapore Blood Transfusion Service was also given a new home when the National Blood Centre opened in April 1988. It was equipped to handle 129,000 donors yearly and had increased refrigeration space for storing blood as the public was encouraged to donate their own blood before elective surgery. Incorporating lessons from the Spyros incident, it had a flexible design to cope with emergencies and operate as a base for mobile donation sessions around the island. Its auditorium and waiting rooms could be converted to handle 240 donors an hour compared to only 60 in the old building. The building was also designed to house the specialised testing and investigative laboratories of the Institute of Science and Forensic Medicine that occupied half of the new premises.

Plans to build or upgrade hospitals also proceeded apace. In some cases, it was to prepare them for subsequent corporatisation or restructuring. In August 1988, Acting Health Minister Yeo Cheow Tong announced that Tan Tock Seng Hospital (TTSH) would undergo a $210 million redevelopment which would also make it the first general hospital in Singapore to have a geriatric unit.

Mental health services saw a quantum leap in capacity and services when the old Woodbridge Hospital moved into its new complex in Hougang in April 1993. To remove stigma and to facilitate the efficient operation and implementation of the National Mental Health Programme, Woodbridge Hospital was re-organised and renamed Institute of Mental Health/Woodbridge Hospital (IMH/WH).

Community hospitals too had their beginnings in this decade. They were seen as an effective way to manage costs, especially for the elderly, as patients who did not need the full services of a bigger hospital could continue their recovery in a lower-cost community hospital before returning home.

The first was the 60-bed St Andrew's Community Hospital at Elliot Road, started by the Anglican Diocese of Singapore in 1992 to provide step-down, subsidised care for the elderly. The aim was to complement the inpatient services provided by hospitals like TTSH and SGH.

The Government's first purpose-built community hospital opened in Ang Mo Kio town in January 1993. Catering to the local residents, it was

Stepping up care for the community… a Senior Citizen's Health Care Centre was introduced at Toa Payoh Polyclinic (below) while nurses from Ang Mo Kio Polyclinic conducted home visits for patients in the neighbourhood (right).

129,000

The number of blood donors the National Blood Bank was equipped to handle yearly when it opened in April 1988

▲ Poised for growth… the National Skin Centre was restructured in December 1988.

equipped with facilities for the elderly such as rehabilitation services, day care and a medical centre.

Restructuring
public healthcare

The capacity expansion was complemented by plans to organise the healthcare institutions for greater effectiveness and productivity. Health Minister Howe Yoon Chong, who served from 1982 to 1985, mooted the idea of restructuring when he spoke at Toa Payoh Hospital's silver jubilee celebrations in May 1984.

He said MOH had been "wrestling with the problem of how to improve our hospitals, to extend better terms of employment to our doctors, nurses, technical and other paramedical staff to encourage them to be more efficient and productive".

The plan, still in its conceptual stage, was to "permit each hospital to have greater autonomy and independence to manage its own affairs".

"Each hospital being self-governing will be managed and run as a separate entity with minimum policy guidance from the Ministry. All revenues and expenditure will have to be properly accounted for. Each hospital will have its Board of Governors, Management and Supervisory Boards… this drastic change calls for a new generation of Medical Directors, Hospital Administrators and Managers. Hospitals can then compete with each other. The more successful ones will be in a better position to acquire new equipment, to attract better staff, and to pay better salaries, specialist allowances and bonuses," he said.

The plan for restructuring was announced in January 1985 and stated that Kent Ridge Hospital would pilot the concept for two years. If successful, it would be introduced to the rest of the public hospitals. Renamed the University Hospital in January 1985 (and subsequently renamed National University Hospital), this teaching hospital was owned and operated by University Hospital Pte Ltd, a subsidiary set up under the government-owned Temasek Holdings.

Dr Kwa Soon Bee, MOH's Permanent Secretary and Director of Medical Services, was chairman of the University Hospital's board of directors. In January 1985, he outlined the vision for the hospital at a press conference: "The best professionals from the National University of Singapore would work in the new environment and the new system, so that they can take medicine to higher levels."

The term "restructuring" was adopted to better describe the unique Singapore model where the healthcare institutions were individually corporatised and had the autonomy to determine their own affairs while remaining government-owned. They would continue to receive government subsidies, or subvention, to cover costs and subsidies for the poor.

Two years after the National University Hospital (NUH) opened, the Health Corporation of Singapore (today's MOH Holdings Pte Ltd) was incorporated in April 1987 to acquire and manage all restructured hospitals and public healthcare institutions. This was followed by the restructuring of the National Skin Centre, which replaced the Middle Road Hospital, in December 1988. Next up was SGH in April 1989.

◀ Outlining the vision… speaking at the inauguration ceremony of NUH, Dr Kwa Soon Bee said the new environment and new system of the restructuring model would lift medicine to greater heights.

The journey was not all plain sailing. Questions were surfacing about caring for the poor. Would patients receive the appropriate standard of medical care regardless of their ability to pay? What was the role of the Government in ensuring affordability? Did restructuring mean privatisation?

Unions were worried over the possible loss of benefits to employees. The concern was employers cutting back on staff medical benefits if medical charges rose after the hospitals were restructured. Economists, academics, law makers, the media and the public in general worried over the blurring of lines between public and private hospitals. Restructured hospitals could set their own ward charges and pay their doctors higher wages to incentivise them to stay in service. How was this going to affect patients' bills? How did this blend with the Government's aim of providing the best healthcare at affordable prices?

There were concerns about hospitals pushing up costs by competing to upgrade medical services and introducing expensive programmes. In the March 1990 budget debate in Parliament, Dr Tan Cheng Bock, a Member of Parliament, warned that with SGH and NUH being publicised as centres of excellence, it could push other hospitals into the "rat race for medical excellence". Others were worried that doctors would order unnecessary tests to boost their income.

There was public concern that subsidised patients in Class B2 and C wards could be neglected. The main worry was that doctors, who only earned consultancy fees from treating A and B1 class patients, might spend less time on those in the more heavily subsidised wards.

Doctors were affected too, thanks to the wide disparity in income across medical specialities. The newly-restructured SGH had lifted the ceiling on specialists' consultancy fees in a bid to keep them from leaving for the more lucrative private sector. This was also quickly adopted by NUH and, with the rest of the restructured hospitals likely to follow suit, sparked fears that costs would escalate. It was also feared that senior doctors would be more interested in competing for well-heeled patients with more paying power and neglect to train younger colleagues or conduct research.

The debate came to a boil when SGH phased out its Class C wards upon restructuring. In Parliament, members who generally supported restructuring condemned the move. Former Health Minister Goh Chok Tong, by then First Deputy Prime Minister, said he felt it was a "serious mistake" for SGH to have scrapped those beds. He said the old C class wards had been demolished because they were "not in keeping with the ambience" of the hospital.

The Government responded through the years with repeated assurances that restructuring would lead to better services. For example, in a budget speech to Parliament in March 1989, Acting Health Minister

▼ Now you C it, now you don't… debate came to a boil when SGH phased out its C class wards upon restructuring.

Samuel Lee Wei Jian, the first test-tube baby in Asia

Yes, I'm man-made but all babies are miracles

FOR most of my life I have been told I am a miracle. To be honest, I didn't know what the fuss was about when I was born on 19 May 1983 until my parents explained it to me when I was about four years old.

I kept hearing that phrase "test-tube baby" but didn't know what it meant. My parents tried to explain as simply as they could that I was not conceived the usual way. Then, since I was pestering them for a brother or a sister at the time, they decided to tell me how I was conceived. In a way, that let me know how much they went through to have me.

It was only later, when I was in my teens, that I found out I was Singapore's first test-tube baby. In fact, Asia's first test-tube baby.

My parents got married in 1976 when my father was 21 and my mother 19. They tried for a while to conceive naturally but were not successful. I think the doctors called it unexplained infertility. In 1982, they heard about the clinical trials at KK Hospital (now known as KK Women's and Children's Hospital) led by Professor S.S. Ratnam and Professor Ng Soon Chye and decided to volunteer for it. My mum was one of eight women who had fertilised eggs implanted in them in those first trials and, as it turned out, she was successful in getting pregnant on the second attempt.

My parents were worried throughout the pregnancy and they told me that the medical team monitored my mum closely.

When I was born, there was a lot of media attention on my parents which I think they were not prepared for. We are an average Singaporean family living in a HDB flat in Woodlands. My father was a security supervisor and my mum was a secretary then. Yet because I was considered "a miracle", a lot of attention was focused on us.

When I was a little kid, I thought it was fun seeing my pictures in the newspaper and on television. Gradually I didn't think much of it. When I started going to school, my friends would see me on television or in the newspapers and tease me. They called me "man-made".

I thought it was funny and laughed it off. But, in reality, they were right. That said, despite all the media interest in me as a "medical breakthrough", my parents raised me like any other child. I played with cousins who were about the same age, went to school like a regular kid, hung out with my friends and, if was naughty, my parents would punish me. I never thought I was different from anyone else or that I was special. Especially since I was delivered the "natural" way.

Even when I met Singapore's other test-tube babies at a tea party at KK Hospital when I was about 10 or 11 years old, I just thought "oh, there are more of us". It was only when I was about 13 that I realised what a big deal this was, not only to my parents but to Singapore. After all, I was conceived in Singapore with the help of a Singaporean medical team just five years after the first baby ever born from In-Vitro Fertilisation.

Now that we are celebrating SG50, I get a lot of requests for interviews. All I can say is that I feel proud to be part of the nation's medical history. And the test-tube procedure allows couples who can't have children the "natural" way the opportunity to be parents.

I still keep in touch with Professor Ng; after all, he had a hand in my conception. Now I am an entrepreneur in the food and beverage industry and, like most Singaporeans, have dreams of doing well in my business. My parents want me to eventually settle down and have children.

I better do my part, looking at the fertility rate! And whether my children come out of a test-tube or not, I think all babies are miracles.

Samuel Lee Wei Jian was born five years after the birth of Louise Joy Brown, the world's first test-tube baby, in 1978. In-vitro fertilisation (IVF) was a revolutionary scientific breakthrough at the time, creating a tremendous buzz in the medical community. A 10-member team in Singapore led by Professor S.S. Ratnam began its IVF programme in August 1982. Professor Ng Soon Chye, then a young medical graduate, was sent to Monash University in Melbourne to learn about IVF techniques from Professors Alan Trounson and Carl Wood who had achieved Australia's first successful IVF birth in 1980. According to Prof Ng, upon his return, the team converted a small male changing room on the second floor of the old KKH into a laboratory and tested their IVF techniques on mice for six months before they felt confident enough to attempt it on humans. Among the eight women involved in the trials, Samuel's mother Madam Tan Siew Ee was the only one who became pregnant. The pregnancy was achieved on the fourth cycle and the second embryo replacement.

◄ Baby, what an achievement… Samuel rests in his mother's arms as she poses with the IVF team from KKH that helped create him.

Yeo Cheow Tong showed a projected drop of 5.3 percent in the MOH budget for fiscal year 1989 compared to the past year. He attributed the drop to the restructuring of SGH.

He also assured parliamentarians in the same session that the "objective of restructuring is to enable government hospitals to be more responsive to the needs of the public and to provide a better level of service to Singaporeans… (and) the end result of restructuring will be government hospitals which are more cost effective, efficient and highly responsive to public needs". He repeated similar assurances in the 1990 Budget debate, assuring the house that the Government would closely monitor restructured hospitals for duplication of expensive services.

As such, restructuring stayed on course. Kandang Kerbau Hospital (KKH) and Toa Payoh Hospital were restructured in April 1990. The Singapore National Eye Centre (SNEC) followed suit six months later, TTSH in April 1992. Ang Mo Kio Community Hospital opened in June 1993 as a corporate entity. More were to follow in the ensuing years.

Mr Yeo, who was Minister of State for Health from 1985 to 1986, took on the role of Health Minister twice. First, from 1987 to 1994, and again from 1997 to 1999. Thus, he was intimately involved with the implementation of restructuring and the healthcare financing plans.

In an interview for this book, he recalled the challenges of the decade. In 1985, he had a "broad mandate" from then Prime Minister Lee Kuan Yew to "get our healthcare and (its) related services up to speed".

"Together with (Permanent Secretary) Dr Kwa, we took a good hard look as to where we were at the time and identified the key areas that needed improvements. We needed some drastic surgery. Our healthcare facilities, other than SGH, were very old. They were sprawling, they were poorly equipped and I realised that we were going to need big bucks just to improve the physical infrastructure."

"The Cabinet agreed to rebuild TTSH, KKH and all the specialist national centres. So there was a huge expansion, at a time

5.3%

Drop in MOH budget projected by Acting Health Minister Yeo Cheow Tong in March 1989. He attributed it to the restructuring of the Singapore General Hospital

when we really didn't have that much spare cash. It showed that the Government has been committed to healthcare from day one, even in those days when we had a lot of competing demands for funding."

He added that the Government's commitment could be seen in three parts – "hardware, software and funding". The hardware was the massive rebuilding programme. The software referred to the people needed to ensure the hospitals were efficiently run and could provide the quality of services that met rising expectations.
It took a good seven years, from 1985 to 1993, to find good administrators among medical and non-medical staff, and there were opportunity costs.

"It's a fine balance between having someone who knows medical issues as well as possesses management aptitude, versus letting someone excel in the medical process. The ideal is someone who's a good manager and a good doctor. We tried to fit the people we had to the needs of the day. That's the same challenge for everyone, not just MOH," said Mr Yeo.

The third big issue was funding. With the upgrade in quality of care, "affordability became very important".

As Mr Yeo explained: "We realised that the most equitable way was to build on what we have, which is really based on class of wards with very, very generous subsidies for B2 and C. So even as we upgraded the hospitals, bringing in new hospitals, new wards, better equipment and all that, we made sure that lower-income Singaporeans need not fear about affordability."

Nevertheless, MOH had to contend with public concerns about the cost of healthcare.

"Newspapers were carrying all kinds of articles and we had to reassure, almost continuously, that Singaporeans need not worry about affordability. If you go to B2 or C wards, you get the same service level. And you are so highly subsidised that even if you cannot afford the subsidised fees, we waive them anyway. I had to reiterate that a certain percentage would always be subsidised. If anyone wanted Class C and it was full, they would be put in Class B until Class C was available. It took a while for Singaporeans to be assured that this was indeed so," said Mr Yeo.

According to him, there was one more factor that made good sense for restructuring.

"When I first went into MOH, I was really appalled to find that everything went through HQ. (In) meetings with the hospitals' Medical Directors in those days, they all complained about it. HQ was the bottleneck because everything went to HQ, including assigning of personnel. SGH in those days probably had about 4,000 staff, TTSH approximately 2,000-odd to 3,000, and everything had to flow through HQ. It was really inconceivable, so we felt that we had to devolve authority from HQ and that led to the restructuring programme."

For those who supported the aims of restructuring, it provided the opportunity to improve and benchmark against the best in the world. Professor Charles Ng, Emeritus Consultant, Department of Obstetrics and Gynaecology, SGH, recalled his elation at the time: "The restructuring was great because it was the first time that it allowed an entity like SGH to decide what it wanted to do and how it wanted to carry out its plans. This gave us a chance to set our benchmark. We were not going to compete with TTSH or NUH; we want to compete with the Mayo Clinic… that's our objective."

"When I first went into MOH, I was really appalled to find that everything went through HQ. (In) meetings with the hospitals' Medical Directors in those days, they all complained about it. HQ was the bottleneck... it was really inconceivable, so we felt that we had to devolve authority from HQ and that led to the restructuring programme."

Health Minister Yeo Cheow Tong (above, being sworn in as Minister for Health in 1990). He had two stints in this job, from 1987 to 1994 and from 1997 to 1999. He had also served as Minister of State for Health from 1985 to 1986

Making healthcare affordable

The introduction of Medisave, MediShield and Medifund was completed during this decade. The Medisave scheme had been introduced in the National Health Plan of 1983. In April the following year, it was implemented in all public hospitals.

Medisave ensured that every working individual who contributed to the Central Provident Fund (CPF) set aside savings for his medical care. It embodied the philosophy of shared responsibility for one's healthcare and underlined that the welfare state – a system based on taxation to provide free medical services to all – was not for Singapore. The desire was to discourage overconsumption of medical services, over-dependency on the Government and wastage.

The idea of using CPF to pay for medical care was not new. It had been mooted by Dr Goh Keng Swee in the 1970s, when he was Deputy Prime Minister. In 1980, PM Lee Kuan Yew had asked Mr Goh Chok Tong, then the Health Minister, to develop "good health services, with waste and costs kept in check by requiring co-payments from the user". Besides Mr Goh, the stalwarts who shaped Medisave included MOH Permanent Secretary Dr Andrew Chew, who coined the term, and Mr Khaw Boon Wan, then Head of Development at MOH.

The implementation of Medisave went smoothly. At its introduction, employees contributed 20 percent of their wages to CPF, a sum matched by the employer. From this sum, six percent of the employees' wage would be allocated to Medisave. It could be used only to pay for hospitalisation of the account holder and his or her family, subject to caps on the daily withdrawal limits and the class of ward the patient stayed in.

However, there were some obstacles. The rising withdrawals from Medisave added another layer of concern, compounded by ignorance among the public about the uses for Medisave, as shown by survey results. There was concern that the widespread belief among members that their unused Medisave balances would be taken by the Government could lead to excessive spending on unnecessary procedures.

Over time, Medisave underwent fine-tuning to meet changing needs. In January 1986, it was extended to cover patients in private hospitals. It also provided cover for an account holder's grandparents, in addition to his parents, spouse and children. By July 1992, it was extended to self-employed Singaporeans who were contributing to the CPF scheme.

However, Medisave was not expected to cover all medical costs. Hence, in July 1990, a low-cost catastrophic health insurance plan called MediShield was introduced. It was meant to help cover long hospital stays or costly treatment such as chemotherapy. Premiums for MediShield were paid from the individual's Medisave account.

The needs of the poor were taken into account too. In April 1993, an endowment fund called Medifund was established. The fund would receive money from government budget surpluses in good years. Interest from this capital sum would be used to cover hospitalisation bills of the poor after assessment of their means. Qualification would be made on a case-by-case assessment, with preference given to those with low income or the financially-strapped elderly with little Medisave or MediShield cover.

The 3Ms were regularly improved as the Government gained experience from running this unique system of healthcare financing. In March 1994, MediShield Plus was introduced to provide adequate coverage for those staying in Class A and B1 wards on a voluntary basis.

Medisave matters… as many people did not understand the value of Medisave, MOH produced simple yet informative posters to educate the public on how to use it and Singapore's medical services wisely. By the way, it was MOH Permanent Secretary Andrew Chew (below) who coined the term Medisave.

Senwan Jamal, Senior Medical Technologist, Department of Pathology, Singapore General Hospital

Makeshift refrigerators to hold bodies from Hotel New World disaster

NOT many people know what medical technologists do, especially in histology because our work is quite low-key, in the background. We investigate tissue samples to help doctors and pathologists diagnose their cases.

But when the Hotel New World collapsed in 1986, we had to do a whole lot more. Having got word to expect about 100 bodies, we were worried. We needed to have makeshift refrigerators to hold that many bodies, so we ordered two 20-foot freezer containers with racks from Ben & Company (now QAF Limited). One container was for bodies that had just arrived, the other was to store bodies after the post-mortem was done.

That really was my most challenging case. Unlike the Spyros ship fire, where all the bodies showed up more or less at the same time, the bodies from Hotel New World came in a trickle because of the demanding rescue work. In the end, it was not 100 bodies, but about 33. Even then I remember our supervisor Prof Chao Tzee Cheng's quick thinking. It was in the 1980s and we were using film cameras. With so many bodies, we needed to be fast and could not wait for the photos to be developed, so he told us to buy two Polaroid cameras from Chinatown, using his own money, so that we could photograph the bodies right away.

I also remember being called back to work on a Saturday afternoon in October 1978 when a fire on board the Greek tanker S.T. Spyros at the Jurong Shipyard left 76 people dead. All the men in our team were sent to the mortuary while the women worked in the lab. We had to take photographs, take notes – handwritten ones as we didn't have computers or iPads then – describe the clothing, the external injuries and take blood from the neck as it was the fastest way of getting blood to test for toxicology and carbon monoxide poisoning.

There were three types of injuries found on the Spyros fatalities, from completely burnt bodies to poisoning from the smoke. We needed help so we called the police and the army who sent us these NS boys to carry the bodies. Some of them fainted because they couldn't handle the smell or the level of burns on the bodies.

Perhaps if they had spent as much time with Prof Chao as I did, they would not have reacted that way. He was a very smart man, also very jovial. One of my most memorable moments with him – it still makes me laugh today – is when Prof Chao asked us to buy cigars when we had to examine decomposed bodies. We would smoke the cigars while examining the body to cope with the terrible smell of the decomposition. Of course we can't do that now but Prof Chao was always a bit of a rebel.

My team and I were quite devastated when he died suddenly in 2000. We still miss him.

In fact, the smell of Formalin (formaldehyde mixed with water) was something every medical technologist of that time was very used to. In the 1970s, when I started work in labs after passing an exam that came after three years of training under senior officers, the labs were not air-conditioned. Despite the high ceilings, open windows and many fans at full blast, the pungent smell of Formalin would always linger in the air and on our lab uniforms which at the time looked like a Malay "baju" (outfit) with the shirt and pants.

Nowadays, things have changed. All the major incidents, especially the two mentioned earlier and even the cable car accident in 1983 had an impact on the way we ran our labs. Health and safety became more important, especially staff and patient safety.

I am 62 years old now and, when I look back to see how far we have come, I am amazed how we did what we did. It is not glamorous but it is never boring.

◄ Life in the lab… Mr Senwan still remembers the smell of Formalin in the labs when he started work in the 1970s.

Private insurance companies were allowed to offer competing MediShield Plus-type schemes which offered similar benefit structures. The premiums for these schemes could be paid from Medisave too.

While these critical policy issues on restructuring and healthcare financing were being addressed, another critical social issue had loomed on the horizon and needed urgent attention.

Twin dilemmas:
Fewer babies, more elderly

The Report on the Problems of the Elderly, also called the Howe Report (named after Mr Howe who chaired the committee), was released in February 1984. Its opening line was "society must change its attitude towards old age" and it was followed by a clear-eyed analysis of Singapore's ageing issues and recommendations on how Singapore should prepare for an ageing population.

The report raised the alarm on Singapore's declining birth rate. It noted that the "combined effects of a falling birth rate and improvements in life expectancy" had resulted in a structural change where there "will be fewer economically active people to support more inactive ones". If the birth rate was left unchanged, the proportion of the very young (0 – 14 years old) would shrink from 27 percent in 1980 to 20 percent in 2030. The economically active group (15 – 64 years) would shrink from 68 percent to 61 percent; and the aged (over 64 years) would almost quadruple from 5 percent to 19 percent. This would translate to a drop from 15 working persons supporting every aged person in 1980 to only three in 2030, according to the Howe Report.

The report called for a National Policy for the Elderly, and proposed comprehensive measures to prepare for the future greying population. They covered employment options, financial security, health and recreational needs, provision of social services

▼ Raising awareness… the Howe Report predicted the challenges of dealing with an ageing population.

1985 - 1995

▲ Two little… in 1988, DPM Goh Chok Tong (above, with a family during the Chinese New Year garden reception party at the Istana) announced that a three-child family was better.

and institutional care as well as strengthening family ties.

Unfortunately, many of the recommendations in the Report were overlooked due to the furore over its proposal to defer the withdrawal of CPF savings to 60 or 65 years. The logic was that people could work longer and thereby save more for retirement needs. But some people saw it differently. They felt the money was theirs and had made plans for its use. Some people felt insulted that the Government did not trust them to use their own money wisely. Another opinion was that people would be too old to use their money effectively at age 60 or 65. The only concession some would make was to have partial withdrawals at age 55.

One of its most passionate critics, Dr Toh Chin Chye, by then a backbencher in Parliament, said the proposal was a breach of the fundamental principle on which CPF had been set up. He said the proposal followed the precedent set by Medisave to dip into CPF funds and wanted assurance that a law would not be passed allowing CPF withdrawal only if the member died.

Few also supported the Report's proposed law to make children support their parents as they felt filial piety could not be enforced by law. However, many supported the idea of making rules of entry into homes for the aged more stringent and the provision of more recreational facilities for the aged.

Hindsight and the present day reality of a fast ageing population show the Howe Report's many recommendations were farsighted. The Maintenance of Parents Act was passed in 1995 to enshrine in law the moral responsibility that children have to take care of their elderly parents. And as life expectancy continues to increase, indeed, the challenge for individuals to live a dignified and financially independent old age still remains salient today.

At the other end of the age spectrum, Singapore faced a completely different challenge. After two decades of successful family planning, the problem now was not too many babies but too few. The focus shifted to population planning and the message to families from the 1980s onwards was not to stop at two, but to have three or more if they could afford it.

The renewed focus on family planning policies came on the heels of the Great Marriage Debate of 1983. The Graduate Mother Scheme of 1984 followed, offering graduate mothers incentives to have more children. Critics accused the Government of practising eugenics, or selective breeding of individuals for their desired traits.

To encourage more people of different educational backgrounds to get married, the Social Development Unit (SDU) was set up by the Ministry of Finance in January 1984. It organised events for graduate singles to meet, hopefully leading to marriage. The measure upset many, including graduate women. The Social Development Section (SDS) was set up in 1985 for those with secondary education and the Social Promotion Section was set up in 1990 for singles who had not completed secondary education.

By contrast, the Cash Grant Scheme of June 1984 aimed at young, non-graduate married couples with low income to have no more than two children and to break out of the poverty cycle. A woman under 30 who agreed to be sterilised after one or two children would receive $10,000 in her CPF account towards payment for a government flat. Both man and wife had to be Singapore citizens or permanent residents. Reversing the sterilisation meant the grant had to be paid back to the Government, with compound interest.

However, in the changed social economic context of the 1980s, it added more fuel to the public fire. The Graduate Mother Scheme was withdrawn in 1985 and the Cash Grant Scheme never gained traction. The consistently low birth rate had dictated a change in direction.

On 1 March 1987, Mr Goh Chok Tong, then Deputy Prime Minister, announced a new population policy. It came with a raft of measures to get families to regard the three-child family as the new normal. The Stop At Two campaign was over.

Some of the old prerogatives were still carried over – parents must be responsible and make sure they could afford to have more children. Those who could really afford it were encouraged to have more than three. Significantly, having more children was not pegged to education.

Mr Goh said it was "frightening… that there will be fewer young people to support the old". Whereas there were nine young people supporting one elderly person in 1987, "in the year 2030, there will be only two young persons supporting one old person". (This ratio was lower than the one in the 1984 Howe Report.) The low birth rate was due to more women staying single, families having fewer children and a smaller number of women in the fertile age group in each generation.

The package of incentives, aimed at easing the burden of having more children, was generous. The old disincentives against school registration for the third child would go. The third child would get priority if there were fewer vacancies than children. There would be subsidies for children enrolled in approved childcare centres. A tax rebate of $20,000 would be given for third and fourth births.

Medisave could be used for hospital and delivery charges, regardless of the mother's educational qualifications. Mothers with young children could ask for flexi-time or part-time working arrangements. Three-child families wanting to upgrade to bigger flats would get priority. Abortions would be discouraged and counselling made compulsory before and after abortion. Women with fewer than three children who wanted to be sterilised would be counselled too. Singles got even more opportunities to meet and interact through SDU and SDS activities.

If the new policy worked, Mr Goh said Singaporeans would be replacing themselves by 1995. However, as the population trends in the ensuing decades would show, this did not happen.

All in all, the campaigns on family planning, Stop At Two and Have Three Or More, would span the tenures of seven Health Ministers – Mr Chua Sian Chin, Dr Toh Chin Chye, Mr Goh Chok Tong, Mr Howe Yoon Chong, Dr Tony Tan, Mr Richard

◀ Two plus three equals fun… by this decade the message to married couples was to have three or more children, as this Family Life Education Programme poster illustrated.

"In the year 2030, there will only be two young persons supporting one old person."

Deputy Prime Minister Goh Chok Tong on the low birth rate in Singapore

$20,000

Tax rebate given to parents who had third and fourth babies as part of the new population policy announced by Deputy Prime Minister Goh Chok Tong on 1 March 1987

Chandra Palany, ambulance driver, Singapore General Hospital

Shoot the red light

IF YOU'RE wondering about the headline to this article, here's what it means: It's how the doctors tell ambulance drivers like me to drive through red lights at traffic junctions. We only do it when the patient we are transporting is in a critical condition and has to get to the hospital as fast as possible. Of course, if I get caught on the red-light camera, the doctor will write to the traffic police to explain the urgency of the situation and that settles the issue.

However, in my 33 years behind the wheel of an ambulance, I have done it very rarely. Most times, my job is to pick up patients from the airport, from other hospitals or nursing homes and drive them to Singapore General Hospital (SGH). The SCDF ambulances are the ones that attend to 995 emergencies. They are equipped with paramedics and lots of equipment.

Not that I mind, I am quite happy with my job. Thankfully no patient has died in my ambulance... and I hope it stays that way. In fact, before I start work, I always pray that the day goes well and no one dies in my ambulance.

There have been times when it has come close though. I once had an emergency case being transferred to Tan Tock Seng Hospital and a doctor, nurse and attendant were accompanying the patient in my ambulance. While we were on the road, the patient had a heart attack and the team had to give him CPR. I could hear them working frantically in the back, I could also hear the doctor pumping the patient's chest. I was frightened but had to keep steady and drive as fast as I could. When these things happen in the ambulance, I cannot gabra (panic); I have to be steady. They saved the patient and I managed to get all of them to the hospital in one piece.

It's during emergencies like this that the doctor in charge will tell me "Chandra, shoot the red light" and I end up driving very fast. I once had to drive at 130km on the ECP to get a patient from the airport to the hospital before his condition worsened. But I take pride in the fact that nothing tragic has happened while I am at the wheel.

Actually I did lose a patient once but it's not what you think. About four or five years after I joined SGH, I was transferring a patient to Woodbridge Hospital (now the Institute of Mental Health) and there was only a male attendant accompanying him. Because it was not an emergency case, we didn't need a full medical team. When I stopped at a traffic light, a few kilometres from Woodbridge, the patient somehow managed to open the ambulance doors, jumped out and started running. The attendant had to run after him.

I was very shocked but managed to park the ambulance on the side of the road and tried to look for him too. But the guy was very fast and we lost him. I am not sure if they managed to get him back. Now, when I know I have a psychiatric patient in my ambulance, I lock the doors. I don't want a repeat of that incident again.

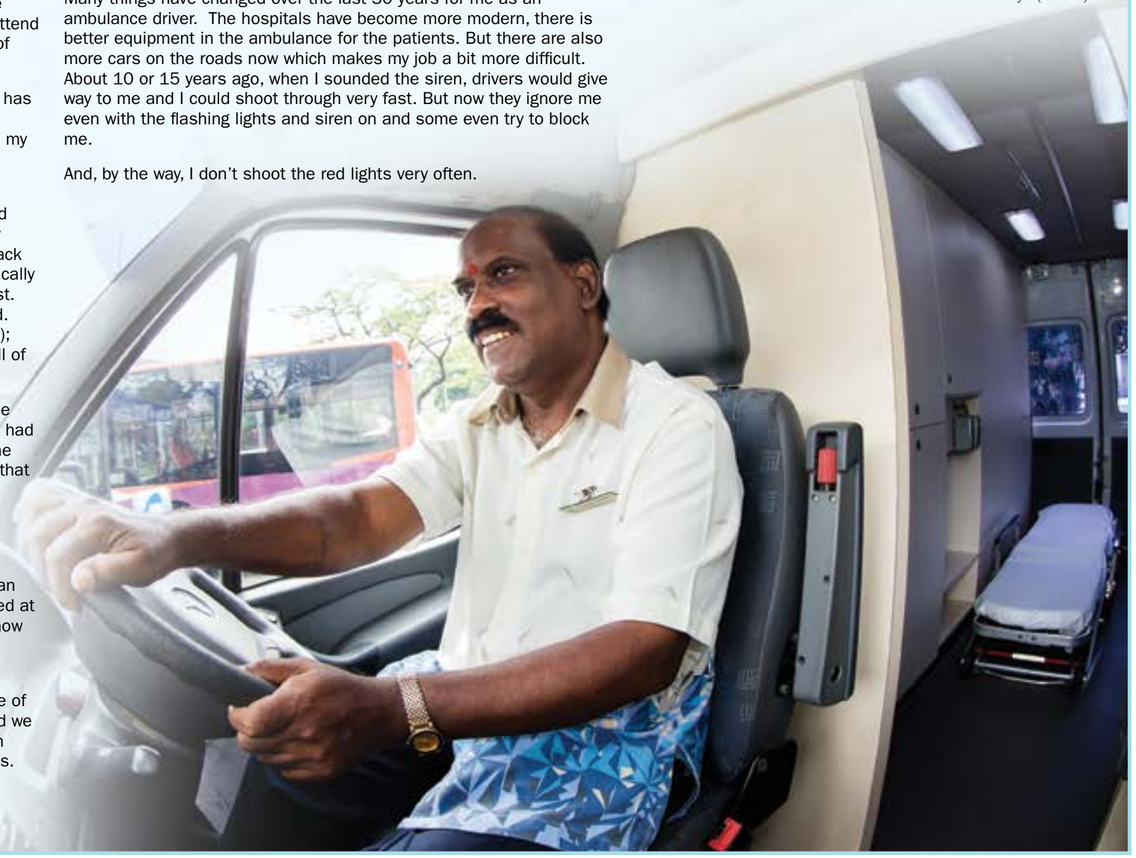
When I am driving, I am quiet. I don't talk to the patients and I only listen to instructions from the doctors or nurses. I don't even ask what illness or disease the patients have as I don't think it's my business. My job is to get them to wherever they need to go, safely and quickly.

I also help patients out of the ambulance and into wheelchairs or help the attendants take the gurney out of the ambulance. I am invisible but once in a while a patient will shake my hand and say thank you; that is very rare though.

Many things have changed over the last 30 years for me as an ambulance driver. The hospitals have become more modern, there is better equipment in the ambulance for the patients. But there are also more cars on the roads now which makes my job a bit more difficult. About 10 or 15 years ago, when I sounded the siren, drivers would give way to me and I could shoot through very fast. But now they ignore me even with the flashing lights and siren on and some even try to block me.

And, by the way, I don't shoot the red lights very often.

▲ Upgraded equipment... the Volkswagen ambulances (above) Mr Chandra drove when he joined SGH in the 1980s were a far cry from the modern ambulances he drives these days (below).



Hu and Mr Yeo Cheow Tong – and two Prime Ministers. Still, the birth rate stubbornly refused to rise.

Road to the White Paper:
Crystallising healthcare policies

The economic recession of the mid-1980s raised other concerns over the long term sustainability of healthcare delivery. The Government set up a Review Committee on National Health Policies in April 1991, chaired by Dr Aline Wong, Minister of State for Health. It examined the rise in healthcare expenditure, ageing issues, Singapore's changing disease profile, rising labour costs and the use of "expensive technology in modern medicine".

The committee released its first report in October that year. Titled Healthy Family, Healthy Nation, it endorsed MOH's policies on promoting healthy lifestyles for the 1990s. It recommended that the main thrust of future policy "must lie in health promotion and disease prevention", strategies proven around the world to "provide maximum returns in the long term for investments on health". It called for stronger emphasis on the role of the individual in safeguarding one's health to prevent the onset of chronic degenerative diseases such as heart disease, stroke and cancer. This would "reduce the unnecessary wastage to our human resources and the suffering caused by ill-health and preventable diseases".

In February 1992, the committee released its second report which covered more policy ground.

Making medicine easier to swallow

Yes, it looks like it belongs in the kitchen, but this wedgewood mortar and pestle is very much a part of medical wards even today. From the 1800s, it has been used to crush and pound medicine into powder form for patients with swallowing difficulties. The mortar and the head of the pestle are usually made of porcelain while the handle of the pestle is made of wood.

It supported the restructuring of public hospitals and the stated aims of greater autonomy leading to improved efficiency and the delivery of better care. It called for a balance between specialisation and general medical care. It wanted the income of doctors in restructured hospitals to reflect their service to patients regardless of type of ward, as well as their teaching and administrative duties. It asked for the training of doctors to be strengthened and nursing training to be upgraded to diploma level.

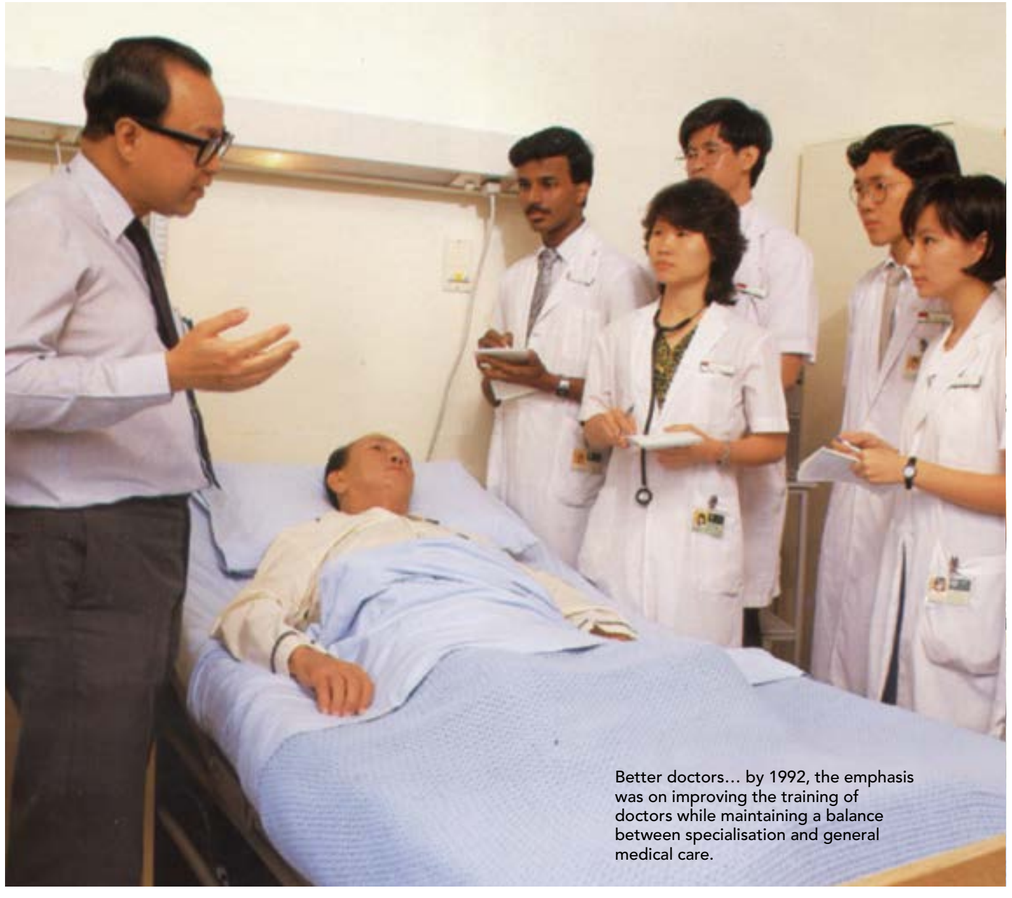
The recommendations also covered the use of Medisave and MediShield and the role of the Government in financing healthcare and managing costs. The latter was to be done in several ways. Among them were the use of public education, a stringent specialist referral system and avoiding the over-supply of doctors and beds. In addition, the use of expensive medical technology was to be contained even as alternative low-cost hospital care was developed and efficiency emphasised.

The report further stated that the "major role played by the Government in the provision of secondary and tertiary care" had to be maintained. This was because experience had shown that "where the Government is involved in direct provision of health services, overall expenditure tends to be the lowest".

Significantly, the two reports covered all the points of public concern in healthcare and pointed the way forward in healthcare policy development. They were accepted by a Ministerial Committee, chaired by Minister for Trade and Industry (MTI) Mr S. Dhanabalan, who had taken over the post from Mr Lee Hsien Loong who had been diagnosed with lymphoma.

In November 1992, it was announced that both Deputy Prime Ministers – Mr Lee and Mr Ong Teng Cheong – had been diagnosed with lymphoma, a form of cancer that starts in infection-fighting white blood cells called lymphocytes which are part of the body's immune system. This news injected some uncertainty into the political and economic arena.

While DPM Ong had low-grade lymphoma which did not require immediate treatment, DPM Lee started chemotherapy immediately as he had intermediate malignant lymphoma. He had to relinquish his ministerial post at MTI and chairmanship of the committee. Mr Dhanabalan, who had retired from the Government just three months earlier, was persuaded by Prime Minister Goh Chok Tong to return and take over MTI and chair of the committee in December 1992. He completed the Committee's report, encapsulated in the 1993 White Paper on Affordable Health Care, and took it through Parliament.



Better doctors... by 1992, the emphasis was on improving the training of doctors while maintaining a balance between specialisation and general medical care.

In the White Paper, the Ministerial Committee concluded that Singapore's healthcare system should neither be "a totally regulated national health service, nor a laissez-faire system where providers have full freedom to organise and to price". It recommended a hybrid system with three levels – subvented hospitals (which receive government subsidies) to be subject to controls in the key areas of pricing and operations; private sector patients using Medisave to be subject to controls on reimbursement limits; and private sector patients on their own to face minimal controls.

The Ministerial Committee's rationale was that there was "no natural limit to the demand for medical care" and it was an imperfect market for healthcare. Therefore, the Government must "intervene to prevent healthcare costs from consuming a disproportionate share of the nation's or a family's resources".

In the Parliamentary debate in November 1993, Mr Dhanabalan said Singaporeans were generally satisfied with the level and quality of primary care and their concerns centred around the affordability of secondary and tertiary healthcare of "the individual, the family, the employer and the community at large". The pressure on cost increase was also strong. He pointed out that Singapore spent only 3.1 percent of its Gross Domestic Product on healthcare, compared to 14 percent in the United States and eight percent in Germany. However, spending on healthcare rose 12 percent per year between 1980 and 1990.

Mr Dhanabalan said that the Government "accepts that healthcare should not be a commodity that is available only to those who can afford it. But neither is it a public good that should be provided without limits and without regard to affordability". He also listed the fundamental principles that would shape Singapore's public healthcare. Among them were the incorporation of good up-to-date medical practice as well as giving patients medically-essential and cost-effective treatment of proven value for illness. This treatment should be delivered without frills and by medical staff working as a team, using appropriate diagnostic and treatment facilities. Also among the principles were the provision of drugs from a standard list more extensive than that recommended by the World Health Organisation (WHO) and treatment by intensive care units based on medical need, regardless of class of patients.

Members of Parliament engaged in three days of lively debate on the provisions of the White Paper, on topics like affordability, increasing Government expenditure on healthcare and quality of care. DPM Lee, who was back in Parliament, weighed in on the debate too. He said that the Government was "delivering high quality, affordable, universal healthcare to Singaporeans, all of them...(but)... was worried about long term trends, because our population is ageing and also because all the developed countries have run into trouble with healthcare, and we do not want to follow their example".

Drawing on many examples, he argued for a

"Healthcare should not be a commodity that is available only to those who can afford it. But neither is it a public good that should be provided without limits and without regard to affordability."

Minister for Trade and Industry S. Dhanabalan. He was speaking as chairman of the Ministerial Committee for the White Paper on Affordable Health Care in the Parliamentary debate of November 1993

12%

The growth of expenditure on healthcare in Singapore per annum from 1980 to 1990

Professor Chew Chin Hin, Emeritus Consultant, Tan Tock Seng Hospital and Honorary Postgraduate Advisor & Adj Professor of Medicine, Division of Graduate Medical Studies, Yong Loo Lin School of Medicine

A doctor never stops learning

MEDICAL education is one of my passions. When I became a doctor in the 1950s, education was very well structured in Singapore's medical school. However, for specialist training we were dependent on medical institutions overseas, especially in the United Kingdom. Doctors had to go there to get higher qualifications. Some went for a year, two years or even three years; that meant a loss of manpower and finance to Singapore. It took Dr Toh Chin Chye to change all that.

Many doctors, especially those of us at the Academy of Medicine (set up in 1957), had been asking for our own specialist qualification system: Something that let doctors work and train in Singapore and only go abroad for hands-on experience. Of course, we knew we needed to have very stringent qualification methods... even better than those in the UK and Australasia.

The Academy of Medicine and the School of Postgraduate Medical Studies spearheaded this move, petitioning the Ministry of Health (MOH) and the Singapore University many times. Nothing much came out of this except for the formation of a committee on postgraduate medical studies in the medical faculty in the mid-1960s.

The situation shifted in October 1967. Dr Toh, who was Deputy Prime Minister at the time, gave a speech where he criticised the medical school and the medical community for not developing postgraduate education and thereby producing specialists. Professor K. Shanmugaratnam, who was the master of the Academy then, immediately called me and said: "Chin Hin, we must respond to Toh Chin Chye."

We convened an emergency council meeting and drafted a reply to Dr Toh. Soon after that he called us for a meeting at City Hall... I think it was held at the surrender chambers where Lord Mountbatten took the surrender from the Japanese. It was a very cordial meeting. Dr Toh can be a very tough person, but he was very kind to us. He said, "Shanmu, you be the chairman of this committee to spearhead the formal postgraduate medical education programme."

So that is how the school of postgraduate medical studies came to be shared equally by the medical faculty and the Academy of Medicine. And that is how our first master of medicine degree, the MMed, came about in 1970-71.

One of things we insisted on was that the standards of examination be very stringent. We had to appoint external examiners to ensure that some of the elements would be similar to, if not even better than, the qualifying process in the UK and Australasia. We started with MMed (Internal Medicine) and MMed (Surgery), then MMed (Obstetrics & Gynaecology) and MMed (Paediatrics). We had paediatrics because of Professor Wong Hock Boon.

Of course, we had our own local examiners to support the external examiners; some were presidents of their respective colleges from the UK and Australasia. We asked the external examiners to give us unbiased reports on our candidates and our examination standards. Invariably, the reports said that both were of very high standards, even higher than in their own countries. And they were so impressed; they even suggested having reciprocal examinations!

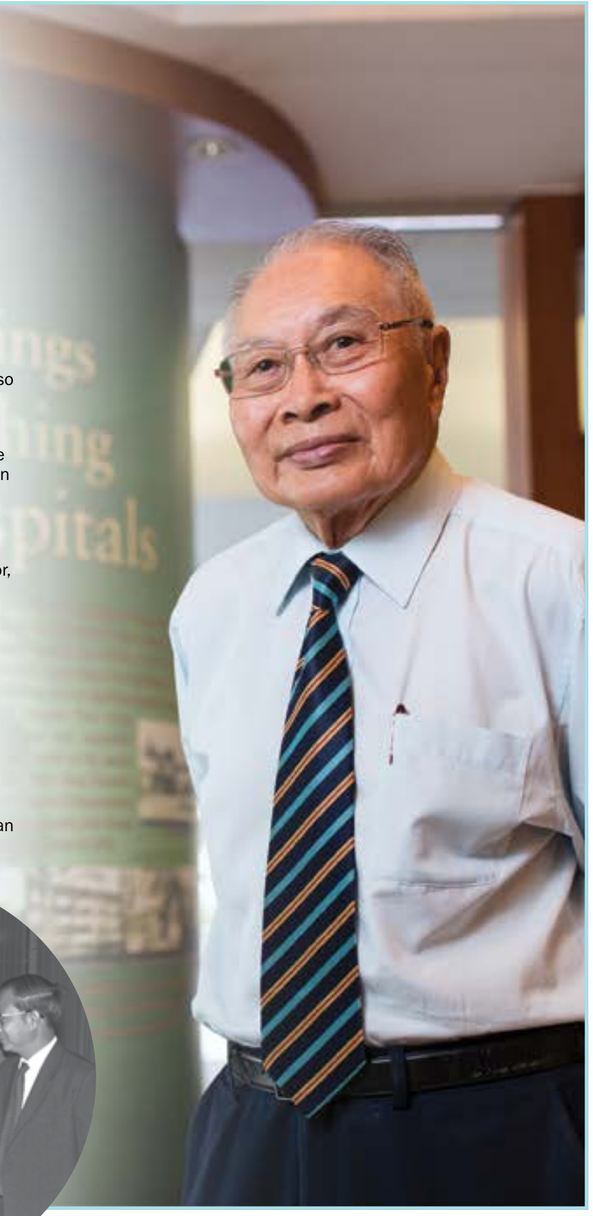
The first joint examination we agreed on was the Fellowship of the Royal College of Surgeons together with MMed; that was in the late 1980s. That was a milestone. Our professional standards had been accepted and our trainees could take the examinations here.

I was then on the board of the School of Postgraduate Medical Studies. In 1991, when I retired from MOH as Deputy Director of Medical Services, I retained my role on the board as deputy director, a post I inherited from Professor Seah Cheng Siang in 1989.

Teaching the doctors has changed a lot since my time, thanks to computerisation and advances in imaging and other technology. Many doctors of today tend to depend on them more. When I started as a young doctor, we always insisted on good bedside teaching and not being dependent on too much investigation. Our old professors like Gordon Ransome could diagnose diseases without much aid. Simple laboratory investigations were crucial to our management, like taking blood samples for malaria parasites. But I think it is very important for young students to have the fundamentals of learning and teaching; to be taught how to be meticulous with patient histories and clinical examination, which can give you quite a lot of knowledge to get the right diagnosis.

Medical training is a lifelong process. A doctor never stops learning and never stops teaching the next generation.

► Master of the Academy... Prof Chew (second from right) was part of the welcome party that greeted Health Minister Toh Chin Chye (far right) when he arrived at the 10th Singapore-Malaysia Congress of Medicine in 1975.



rational view on healthcare policies, the use of finite national resources, affordability, quality of services and the role of the individual for staying healthy. He also pointed to the importance of healthcare education in managing public expectations, including the role of the media, and sensitive issues such as continuing treatment for gravely ill patients.

"Different ways of allocating resources lead to different outcomes. We cannot avoid the responsibility of having to judge which of these outcomes we prefer… how much overall to spend on healthcare… and which areas of healthcare should get more resources, and which areas less. Because a great deal is at stake, especially human lives, therefore, all the more we have to approach the problem rationally, to make sure that no money is wasted, and to make sure that we focus our efforts on areas which do most good," said DPM Lee.

In summary, Mr Dhanabalan said MPs supported the "basic philosophy and the principles of our healthcare system" and assured them that MOH would implement the many suggestions given, where possible. Over the reservations and fears expressed, he said the Government would explain more clearly the intentions, philosophy and principles of the system and fine-tune the system where necessary.

As will be seen, the White Paper mapped an integrated approach to healthcare, providing for major shifts in strategies and approach.

Healthy lifestyles

In many ways, the introduction of the 3Ms, the Howe Report, and the White Paper on Affordable Health Care raised the same key issues – cost effectiveness, new disease patterns and the prospect of an ageing population. In all instances, the emphasis always came back to the importance of disease prevention in reducing illness as well as promoting healthy and active ageing.

Health education campaigns took on clearer, stronger messages, emphasising healthy lifestyles to pre-empt the onset of chronic diseases. They took longer-term perspectives and had broader socio-economic goals. While the strategic goal was to manage the health of the population, the

message was individual responsibility for making the right choices to stay healthy.

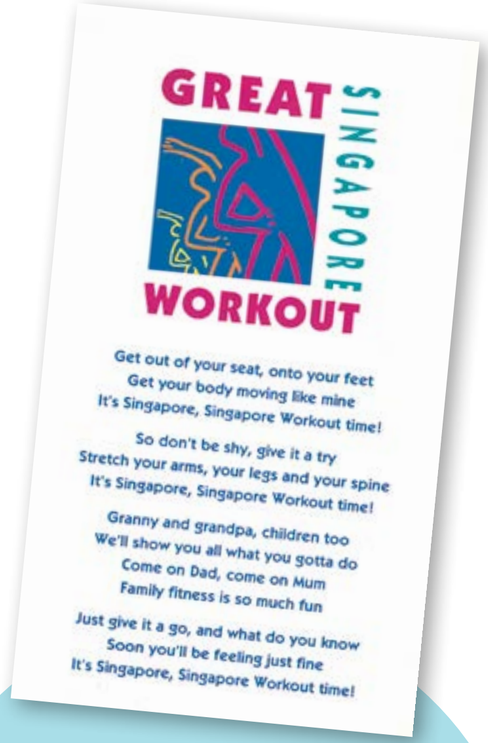
The National Healthy Lifestyle Programme of 1992 was a watershed in health promotion and education for Singaporeans, its cornerstone being the annual month-long Healthy Lifestyle campaigns. The multi-pronged approach aimed to create and foster an environment that supported the physical, social and emotional well-being of Singaporeans of all ages.

The campaigns linked ministries, statutory boards, professional health bodies, employers, unions and community organisations to spread integrated messages. From the first one launched by Prime Minister Goh Chok Tong in 1992, the campaigns were supported by media coverage, advertisements, public forums, talks and carnivals.

They featured special programmes crafted for various segments of the population, covering schoolchildren, employees, national servicemen, housewives and the elderly. Activities were aligned to the theme of the period. Two examples are the Trim and Fit (TAF) programme for overweight children by the Education Ministry and the Workplace Healthy Lifestyle programme.

The campaigns were memorable for mass exercise events like the Great Singapore Workout, a simple series of 15 steps that could be done anywhere,

► Singapore works out… while some preferred to break a sweat with the 15-step Great Singapore Workout (right), others chose to pound the many jogging tracks built around housing estates (above) to improve their health.



Get out of your seat, onto your feet

The Great Singapore Workout was launched in 1993. Video tapes demonstrating the basic steps and pamphlets showing the steps were distributed to schools and organisations. As part of ACES (All Children Exercise Simultaneously) Day, students from various parts of Singapore performed the workout together. Subsequent runs of the campaign had variations like the Great Taiji Workout, which was performed by inmates of Changi Prison in 1994.

Associate Professor Shanta C. Emmanuel, former CEO of the National Healthcare Group Polyclinics

Polyclinics take the pressure off hospitals

IN A way, I have my pregnancy to thank for my long career in primary healthcare!

I was six months pregnant with my first child when my housemanship (junior doctor's training in a hospital) came to an end and, as a result, I got posted to public health instead of a high-pressure hospital setting.

My first posting was to the School Health Services. This was in the early 1970s. Singapore still had kampongs, some of them quite ulu (remote)! After some months of struggling to find my way around and dealing with schools that even wanted us doctors to operate out of dusty storerooms, I was glad when I was reassigned to Queenstown Polyclinic.

The frontline work at the polyclinic suited me well. After all, my stint with Maternal and Child Health services as a young medical officer saw me visit residents of Pulau Bukom and Pulau Tekong. We travelled in little wooden boats and, as the islands had no proper jetties, we had to hop off the boats and just wade to the shore. It was actually quite frightening as most of us could not swim.

The grateful reception from the villagers made it all worthwhile. We used to immunise the children, provide antenatal care for the mothers and general medical care for all those who needed it. The villagers didn't have much so they would give us fresh fish, durians and other fruit.

At Queenstown Polyclinic, we would each see around 150 patients a day. While they appreciated the medical treatment given, many of them used to tell us they did not like coming to the polyclinic. They asked why the chairs were tied to the doctors` tables. They asked if we thought they would steal the chairs! We reassured them that this was done to prevent the chairs from being moved every time the doctors leaned forward to take their blood pressure.

My experiences as a young doctor made me a firm believer in the restructuring of hospitals and the clustering of medical services. I felt we needed to be more autonomous to serve our patients better, to respond faster and better to their needs.

When I was director of the Family Health Services, overseeing the 17 government polyclinics at the Ministry of Health (MOH), my colleague Dr Paul Goh and I were told of our appointments as the CEOs of the restructured polyclinics under the two new clusters – at the time SingHealth and NHG were called the Eastern and Western clusters respectively. I was very clear about the direction I wanted to take. If family physicians were to uplift and practise medicine to the fullest, I knew we had to upgrade the services provided in the polyclinics.

Here is where I really felt the positive impact of clustering and restructuring. I could propose ideas to my Group CEO Mr Tan Tee How, and then work on them without too much constraint.

There were several things I wanted to achieve when I was made the CEO of the National Healthcare Group (NHG) Polyclinics in 2000. This included having a well-stocked retail pharmacy in every polyclinic to better support the follow-up care of patients discharged from the hospitals to our polyclinics. Our doctors could carry out minor surgical procedures like removing lumps and bumps rather than send these patients to the already over-crowded hospitals. Each NHG Polyclinic was also equipped with mammograms for the early detection at affordable rates.

My aim was to take good care of the population at the primary healthcare level with these services and at the same time take the load off the hospitals. In those days each polyclinic served between 700 and 1,000 patients a day. In addition, the 1,800 family medicine doctors and the other members of the allied healthcare teams also provided antenatal care, postnatal care and family planning services, as well as free immunisations to preschool children.

I wanted all healthcare providers at NHG polyclinics to upgrade their skills and get advanced training in key areas in family medicine. We did this by tapping on the Ministry's Health Manpower Development Programme.

I used my background in research to draw up improved health outcomes for the NHG polyclinic patients and to standardise good care across the nine polyclinics. I also spearheaded the drawing up of the latest National Anthropometric Growth Charts for Preschool Children in Singapore, based on the very large sample of healthy preschool children who are brought to the polyclinics for their free immunisations. I engaged Professor Tim Cole from the Institute of Child Health in London, to work with us to draw up the charts. The Preschool Anthropometric Growth Charts are still being used and can be found in the Child Health Booklets used in Singapore for all children.

I am proud of the work my team and I did during my time at NHG polyclinics.

However, there is still an important area where I feel a lot more needs to be done; working with the private GPs. There are many more opportunities for public-private collaborations if the issue of cost is well handled from the healthcare providers' and from the patients' perspectives. This will ensure better strengthened partnerships and better healthcare for all our patients.

◄ Welcome to primary care... A/Prof Shanta Emmanuel greets Health Minister Yeo Cheow Tong at the opening of the Choa Chu Kang polyclinic in 1998.

anytime. The first edition in 1993 scored a Guinness Book of World Records entry for 26,107 people in a mass workout at the Padang. The record was broken when the 1995 edition saw 30,517 people flexing their muscles.

Throughout the National Healthy Lifestyle Programme, the message remained constant. Singaporeans were encouraged to practise healthy behaviour, such as good eating habits and regular exercise, and avoid smoking and casual sex. Where possible, people were also shown how to manage stress and indulge in healthy activities.

Vigilant surveillance

The 1980s and 1990s stood out in terms of the significant change in disease patterns, brought about by improving standards of living. Just when the concerted vaccination programmes had beaten back diseases like polio, malaria, diphtheria, whooping cough, measles, smallpox and cholera, healthcare found itself facing new foes. Over the previous three decades, the fight had been against these diseases as well as infections such as pneumonia and gastroenteritis. Now it was chronic non-communicable diseases such as cancer, heart disease, stroke and diabetes.

New diseases also began to appear on Singapore's shores, carried by travellers coming by air, land and sea. HIV/AIDS was probably the defining disease of the 1980s. HIV, or human immunodeficiency virus, first hit global headlines in June 1981 after its discovery by Dr Robert Gallo of the United States. HIV infection weakens the immune system of sufferers, allowing opportunistic infections like Kaposi's sarcoma, a skin cancer, or tuberculosis to occur. AIDS, or acquired immune deficiency syndrome, is the late stage of the disease.

MOH moved swiftly to stop the spread of HIV/AIDS. With a growing influx of travellers for business and tourism, and globe-trotting citizens, AIDS was immediately made a "must report" or notifiable disease under the Infectious Diseases Act. Doctors who failed to do so could be fined $2,000. A repeat offence carried a $5,000 fine or six months' jail.

MOH was empowered to impose quarantine and order blood tests for suspected cases as well

30,517

The number of people who participated in the Great Singapore Workout 1995, which scored a Guinness World Record entry for the most number of people in a mass workout. It broke the previous record set in 1993 with 26,107 people

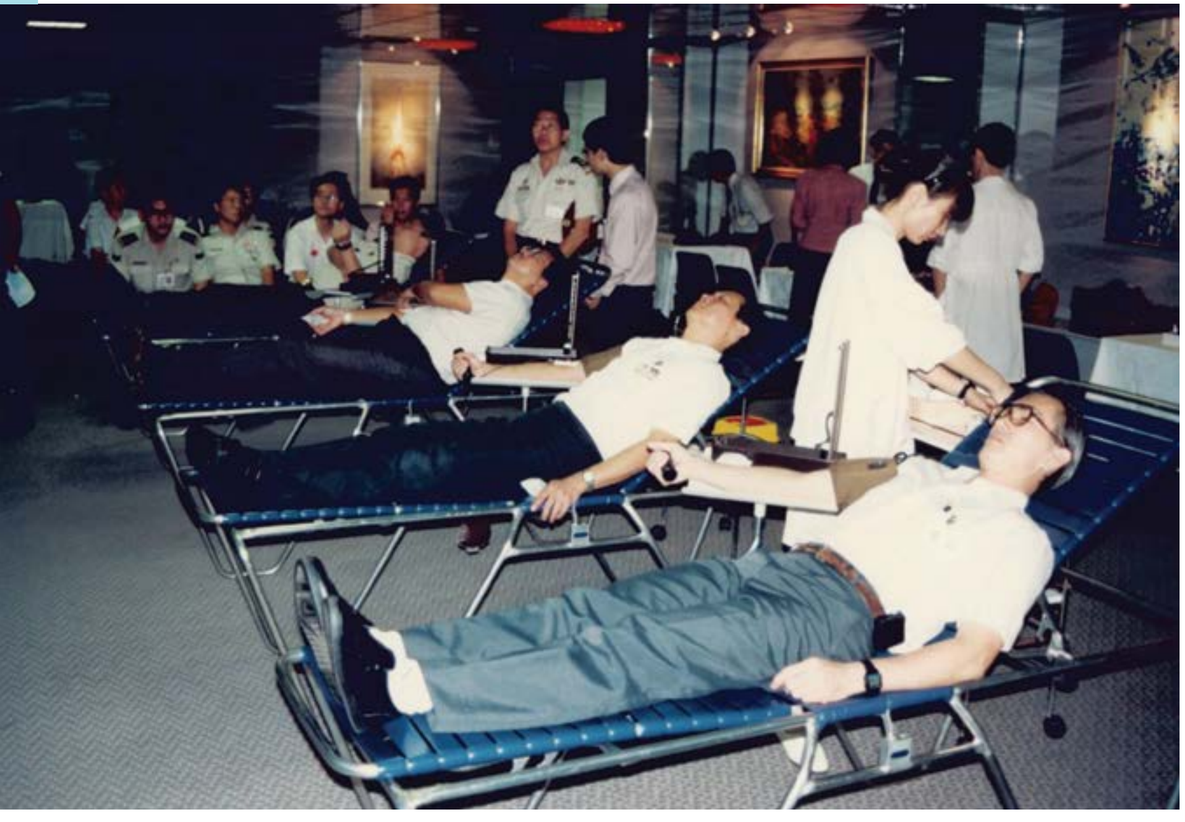
▼ Donating for a good cause… as more Singaporeans stepped up to build the nation's blood supply, the Blood Transfusion Service also started screening the donated blood to guard against the spread of HIV/AIDS.

as interview the contacts of suspects and order post mortems. In addition, the National AIDS Control Programme was formulated in March 1985. Protecting the nation's blood supply became paramount at this stage. Every donation was screened by the Blood Transfusion Service from 1985. A wise move, considering a 1990 study of the first 50 cases of HIV infection found that 24 percent of them were diagnosed via testing of donated blood prior to transfusion.

The emergence of this new disease had put the healthcare world on alert. At home, it put the spotlight on Singapore's vulnerability to imported diseases, given its status as a trade hub and tourist destination. It necessitated a change in disease management strategy.

MOH set up the Department of Disease Control in December 1986. Its role was to formulate disease control policies and programmes as well as conduct epidemiological surveillance of diseases among the Singapore population and in the region. The first four notifiable diseases under its purview were sexually transmitted diseases (STDs), HIV/AIDS, tuberculosis and leprosy.

Aside from monitoring and studying these four notifiable diseases, the Department also took over the monitoring of STDs and leprosy from Middle



▼ Busting the myth… as public education on AIDS shifted its focus to those with high-risk sexual behaviour, the common assumption that AIDS was a homosexual disease was debunked and heterosexuals were told that they too could contract the disease if they did not practise safe sex.

Road Hospital and tuberculosis from TTSH. The Research and Evaluation Department was also set up to undertake monitoring and research into non-communicable diseases. With diseases such as cancer, heart disease, stroke, diabetes and hypertension on the rise, this job became even more important.

MOH's public education effort on HIV/AIDS was widened from sex workers to the general public. The Advisory Committee on AIDS was expanded into the National AIDS Committee in 1987. The education effort shifted focus to groups with high-risk sexual behaviour. Heterosexuals, who considered AIDS a homosexual disease, were told they too could contract the disease if they did not practise safe sex.

With AIDS increasing at a "fantastic rate", in the words of Dr Kwa, the Government felt it necessary to tackle it with the law. By 1992, close to 100 people with HIV had been detected in Singapore. Of them, 38 had AIDS. Another 20 had died. The Infectious Disease (Amendment) Act was passed in January 1992. HIV carriers and people infected with AIDS could be jailed for two years or fined $10,000 for having sex without warning their partners.

The Communicable Disease Centre at TTSH, with its long history as the main treatment centre for infectious diseases in Singapore, assumed primary responsibility for the holistic care of patients with HIV infection and AIDS.

Meanwhile chronic degenerative diseases, the so-called lifestyle diseases brought on by rising affluence, had taken a firm grip. Some of them were compounded by just one habit – smoking.

20-minute HIV test

Conventional screening methods for HIV use laboratory-based blood tests which take two weeks to produce results. Since 2007, MOH has approved a second method: Rapid HIV test kits (below). This new method, which works in a similar way as pregnancy test kits, offers results within 20 minutes. If the result is positive, the blood is sent for a more thorough laboratory blood test.

► Stub it out… as the laws to keep tobacco out of the hands of the youth became increasingly stringent, the rights of non-smokers were also protected with more smoke-free areas designated. By 1988, some 2,000 restaurants had been asked to set up no-smoking zones within their establishments.

Health going up in smoke

While AIDS caused panic and fear, the health of many Singaporeans was literally going up in smoke. Smoking and smoking-related deaths were also rising as the habit hastened the onset of cancer and heart disease. The evidence emerging in the 1970s showed that lung cancer was related to smoking, said Dr Luisa Lee, who was Medical Director of the Training and Health Education Department between 1986 and 1991.

Available figures showed 30 deaths from cancer in 1950. By 1984, it had jumped to 100. Death from heart disease was a little over 50 in 1950 but rose to more than 110 over the same period.

The Government had started work early to make Singapore a smoke-free nation. In 1970 it had banned smoking in cinemas, buses and lifts. Tobacco advertisements were banned on television and in print too.

Despite these early curbs, the addictive habit gained ground. Between 1973 and 1983, cigarette sales jumped from 3.6 million kilograms to 4.4 million kilograms. The rise was attributed to more youths taking up smoking because they thought it was hip or had bowed to peer pressure. This was compounded by the public lacking information on the perils of smoking.

Increasingly stringent laws were combined with practical help and campaigns that ran the gamut from gentle persuasion to scary messages and pictures in the ensuing decades.

A more comprehensive programme and more legislative muscle were thrown into the mix in the 1980s. MOH launched the first National Smoking Control Programme in December 1986, aimed at persuading smokers to quit and dissuading the young from picking up the habit.

The programme kicked off with a wide range of public education material. Among them were a video show, an exhibition and posters on smoking with messages ranging from the humorous to the gruesome. Public and private sector organisations pitched in, with 42 of them putting up "No Smoking" signs in their premises.

Smoking was portrayed as unglamorous, anti-social and disrespectful to non-smokers who had to suffer the effects of second-hand smoke. For the first time, the rights of non-smokers were protected as smoke-free areas were designated. A blanket ban on all forms of tobacco advertising and sponsorship was also imposed.

With each passing year, the national programme and its campaigns became more comprehensive and creative. Help was offered to smokers but the laws were also toughened. For those wanting to quit, there were quit-smoking sessions, quit-smoking kits and even a 24-hour toll free information service, Quitline, manned by trained nurse counsellors who gave tips on how to stop.

Smoke-free areas were extended beyond cinemas, buses and lifts to all government buildings, hospitals, air-conditioned restaurants, department stores and supermarkets. Taxes on cigarettes were increased to make them more expensive. Still, the smoking habit would prove difficult to stub out.

Surveys were done to monitor the numbers, especially among the youth. From 1984 to 1987, smoking among youths aged 15 to 19 had dropped from 5.1 percent to 2.9 percent. It rose again in 1988 to 3.6 percent, prompting the Government to ban the sale of cigarettes to those aged under 18 in 1991.

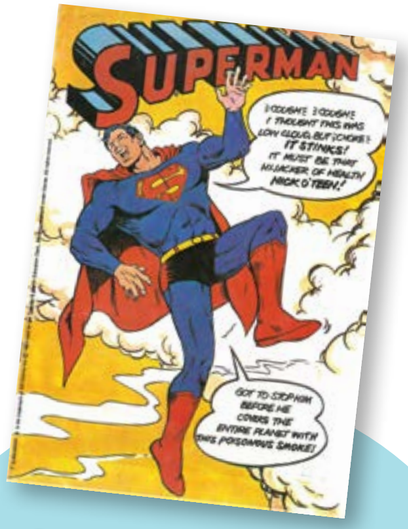
Campaigns aimed at this group employed strategies with youthful themes and appeal. Rap music, science experiments to show the harmful effects of smoking, cartoons, poster and song competitions were some of the avenues explored. Campaign slogans were succinct. For example, the 1990 campaign slogan was "Growing up without tobacco". Popular stars, parents and families were all roped in to pass on the message to young people.

Even Superman and the evil Nick O'Teen were drafted in the 1980s to help spread the message among children and youths.

For Mr Leon Chen, a student at Tanglin Primary School in the 1980s, the campaign and Superman's message had a lifelong effect. He says it reminds him to stay away from cigarettes even now, at age 41.

"I first saw the advertisement in the newspaper when I was nine years old and decided to submit my particulars. I thought it was a contest. A week later, I was pleasantly surprised to find a big Superman comic book, a badge and certificate with my name on it! It was my first Superman comic," he said.

"Being an innocent primary school kid, I really thought that Superman wrote my name and signed that certificate... and it was like a pledge that I've made with Superman. Since then, whenever I am faced with peer pressure or offered a cigarette,



Superman vs Nick O'Teen

Who better than a superhero to get the anti-smoking message across to children? In 1983, MOH's Training and Health Education Department launched an anti-smoking campaign featuring Superman as the ambassador. The various items produced included badges, certificates and even comic books. Not surprisingly, the campaign was a hit amongst schoolchildren, mirroring the effectiveness similar campaigns had when they were rolled out in the US and the UK.

Professor Chew Chong Lin, former Deputy Director of Medical Services (Dental) and Chief Dental Officer

Healthcare, one tooth at a time

DENTISTRY, in my mind, has a very big impact on a patient's quality of life. Here's an example that sticks in my mind: An elderly lady, who was being treated for depression, came to see me. Her daughter told me that her depression was caused in part by loose dentures. She couldn't eat properly. So I put two implants in her mouth and attached the dentures to the implants. She could eat properly as a result and was much happier after that.

That's why I always put patients at the centre of what I do as a dentist, teacher and administrator. Even when I had two runs at the Ministry of Health (MOH), serving first as Deputy Director of Medical Services (Dental) in 1989 and again in 2001 when they changed the title to Chief Dental Officer, I was focused on patients.

My philosophy is simple. When you come into dentistry, you don't study for yourself, you study for your patients. If you don't prepare yourself for the patient, you make an error and the patient suffers, whether the error is damaging or not.

My first stint at the ministry came about halfway through my academic career at the National University of Singapore. In 1989 I was asked to help set up the National Dental Centre (NDC) with one major objective, to centralise dental services in Singapore.

As we also wanted to offer services for both private and subsidised patients, we first tested the private market by renovating an old dental clinic on the Singapore General Hospital campus. When we had a good response, we knew we could offer the same thing at the NDC. When the building was ready in 1995, I returned to the university where I served as dean for two terms until I stepped down in 2000.

That led to my second stint at MOH. Professor Tan Chorh Chuan, who was then Director of Medical Services, asked me to be Chief Dental Officer. This time, there were four things I felt needed to be done.

One was to review the Dental Registration Act. There were challenges to changing the Act and one of the main issues was the inclusion of the specialist register. From a legal standpoint, that specialist list gives better recognition to dentists. It benefits the profession, it benefits the patient. We had to get the dentists to agree which required a lot of selling to the various dentistry bodies. I had a little bit of an edge as all the people running these organisations were my former students.

Secondly, I thought it was time to introduce continuing professional education for dentists. As we had to provide sufficient courses for them to attend at a reasonable price, I set up the Centre for Advanced Dental Education.

Third on my list was training oral hygienists in Singapore. The developed countries had this group of dental professionals. However, in Singapore, we had dental therapists which was a concept developed in New Zealand for its school services. It was a role applied to school dental nurses but they didn't qualify to be on the nurses' register. We eventually decided on a role that combined oral hygienist and dental therapist. The two-year curriculum which was taught at the then Institute of Dental Health at Hyderabad Road was quite similar for both so we added one more year of training and created the Oral Health Therapist (OHT). The OHTs are now trained in Nanyang Polytechnic, graduating with a Diploma in Dental Hygiene and Therapy.

The last thing was to provide training for dental assistants. We didn't have any requirements for formal training so a lot of people were given "hands-on" training at the clinics. We worked with the Institute of Technical Education to set up the NITEC in Dental Assisting.

I am glad I got these four things started. After I completed my Chief Dental Officer appointment in 2005, my successor Associate Professor Patrick Tseng continued and completed the work.

My firm focus on patients and the profession has earned me a fierce reputation among the students I taught. Some of them still recount stories about me throwing their dental moulds away in front of patients and scolding them. Yes, I have done that. Sometimes when students keep making the same mistakes, I would rather they throw away the mould. When you keep repairing it, you never learn the whole process of starting from the beginning.

Looking back, I would still say that dentists learn a lot from their patients. Thanks to the introduction of implants in Singapore's dentistry in 1986, I was able to help the elderly patient with depression. That case also made think there might be other patients out there with similar problems. So I initiated a study with a colleague last year to see how two small implants can help the elderly. We did over 20 cases and are in the process of collating the results. If this works, we can give elderly patients five more years of better eating capability. For them, that is a big improvement in their quality of life.

As I said, patients are always at the centre of what I do as a dentist.

► Dental display… Prof Chew (left) with Health Minister Yeo Cheow Tong and A/Prof Kwa Chong Teck at the opening of the National Dental Centre.

I remember this campaign that I joined and never let curiosity get the better of me."

Other groups that had a high incidence of smoking, especially men and those with lower education, also came under the same scrutiny. In a May 1994 speech launching the annual campaign, Health Minister George Yeo said more men than women smoked – 33 percent among the former and only three percent among the latter. There was also a strong correlation among men with lower income and smoking. Half the men without formal education smoked, compared to 10 percent of those with a degree or professional qualifications.

Despite the relative lack of success with youths, Singapore kept working hard at achieving the ultimate goal: A smoke-free nation.

Specialisation and medical ethics

The 1991 Review Committee on National Health Policies in its report had paid close attention to two important areas of providing quality and affordable healthcare – medical specialisation and ensuring the quality of medical care.

It recommended that specialisation be developed to match patient needs and affordable methods of treatment be employed where possible. To maintain a balance between specialisation and general medical care, overspecialisation was to be avoided and the proportion of specialists capped at 40 percent of doctors. It also called for the strengthening of training of medical undergraduates and "all patients, regardless of

33%

Percentage of Singaporean men who smoked in 1994. In stark comparison, the number for women was a mere 3%

► Making nursing attractive… President Ong Teng Cheong hosted the annual Istana Garden Tea Party on 1 August 1994 as part of the Nurses' Day celebrations. This was part of the effort to recognise nurses.

their class of ward, should form the clinical base for teaching".

The move towards building up greater medical specialisation had begun a few years earlier. The National Skin Centre started operations in November 1988, marking a new era in dermatology. The new centre, about three times the size of the old Middle Road Hospital, would provide a much higher level of medical service than the old hospital. Its doctors would only treat referred patients. Unlike at Middle Road, it would not treat venereal diseases and AIDS patients. The former would be treated at the old clinic at the Kelantan Polyclinic at Kelantan Lane. AIDS patients would be referred to the Communicable Diseases Centre at TTSH. This was intended to remove the stigma that had become associated with the old hospital. People avoided going there because it treated patients with venereal diseases.

At the urging of leading ophthalmologists, especially the late Professor Arthur Lim, the SNEC was established with a $17 million fund from the Government and opened in October 1990. The centre was housed in two extensively remodelled blocks of SGH. Phase Two, an eight-storey block, was completed in 2001. SNEC also set up the Singapore Eye Research Institute in 1997.

The National Cancer Centre Singapore was first formed in 1993 as a unit of SGH but became autonomous in 1997 and moved into its present premises two years later. The Singapore Heart Centre was formed in 1994 (renamed in 1998 as the National Heart Centre Singapore). In 1995, it took over the care of cardiac patients of SGH.

Today, all three centres are leaders in their respective fields, providing opportunities for treatment and research.

When Kandang Kerbau Hospital (KKH) was corporatised in 1990, it also absorbed the obstetrics and gynaecology (O&G) and neonatology departments from Toa Payoh Hospital and Alexandra Hospital. Three O&G departments – Maternal Fetal Medicine, Gynaecological Oncology and Urogynaecology, and Reproductive Medicine – were created to focus on sub-speciality interests. KKH would similarly consolidate the paediatric services in all hospitals other than NUH when its current building on Bukit Timah Road was completed in 1997.

Nursing too saw a landmark change. Faced with a shortage of nurses, low enrollment numbers and projected future needs, the report recommended that nursing be upgraded to a diploma level to raise the status of the profession and attract school leavers.

In a bid to stem the exodus of nurses to the private sector, MOH engaged a team of American management consultants in June 1988 to carry out a three-month pilot study. In October, the ministry announced a new package of benefits for nurses, which included higher starting salaries and bigger annual increments.

To complement the improvements in training and medical facilities, the report called for better control of provision of medical service through the Private Hospitals and Medical Clinics (PHMC) Act. The PHMC Act was passed in 1980 and came into operation in January 1993 to safeguard patients. Under this regulation, no premises could be used as a private hospital, maternity, nursing home, medical (including dental clinic) or clinical laboratory (including X-ray laboratory) unless it was licensed by MOH under the PHMC Act.

It also wanted quality audits, accreditation and effective control of professional standards through the Medical Registration Act.

There were also several pieces of legislation governing professional ethics. The Pharmacists Registration Act was passed in 1985. It empowered the relevant professional board or council to uphold standards of practice, investigate complaints of professional misconduct and remove those deemed unfit to practice.

The Human Organ Transplant Act (HOTA), an opt-out system, was introduced in 1987. It came after extensive studies and public consultation to allow for the removal of kidneys from non-Muslims who die from accidental causes. The real spur for HOTA was the lack of voluntary organ donations. Only 22 kidney transplants were performed between 1970 and 1978. There were none between 1979 and 1981.

The impact was significant. Between 1987 and mid-2004, 222 patients received kidney transplants, an average of 13 per year. HOTA would be further amended in 2004 to widen the pool of cadaveric organ donors and thus benefit more people in need of transplants.

◄ Pledge to heal… all doctors in Singapore take the Physicians' Pledge before embarking on their medical careers. This was initiated by Health Minister George Yeo and the first Physician's Pledge Affirmation Ceremony was held in May 1995.

Between 1994 and 1997, the Health Ministry came under Mr George Yeo. Acting on his belief that medical practitioners should be "deeply rooted in the values and ethos of the practice of medicine", he initiated several measures to reinforce professionalism in the practice of medicine.

MOH set up the National Medical Ethics Committee the same year to help the medical profession ensure a high ethical standard of practice and examine issues in practice and research to protect the rights of patients.

Mr Yeo also initiated the tradition for all new doctors to take the Physicians' Pledge, following a recommendation from the Singapore Medical Council (SMC). The first ceremony took place in May 1995. Since December 2010, under the Medical Registration Act, all doctors must affirm the pledge at a Pledge Ceremony organised by SMC before they are granted full registration to practise medicine independently in Singapore.

Traditional Chinese medicine (TCM) was also looked at. An internal MOH committee was set up in 1994 to review TCM and regulate it to protect the interests of patients. Figures showed that an estimated 12 percent of outpatient attendance was seen by TCM practitioners.

The review resulted in the registration of acupuncturists in 2000 and TCM physicians in 2002, accreditation of TCM training programmes and the setting up of a Chinese Proprietary Medicines Listing Unit in the Ministry.

The coming decade would see more landmark changes as MOH continued to give thought to efficient healthcare system organisation and related issues like affordability, cost effectiveness, efficiency and care delivery models.

▼ Tradition holds strong… small batches of different Chinese herbs are manually weighed, sorted and packed at a traditional Chinese medical hall before they are dispensed to patients.

"All patients, regardless of their class of ward, should form the clinical base for teaching."

One of the recommendations made by the 1991 Review Committee on National Health Policies

I solemnly pledge to:

Always place patient's interests first, and treat them equally; Collaborate with other healthcare colleagues to achieve the desired treatment outcomes.

Extract from the Pharmacist's Pledge, first recited at the Pharmacist's Pledge Affirmation Ceremony in 2008 under the Singapore Pharmacy Board. It is a collection of 10 statements, devised around the acronym "PHARMACIST", that outline the values and ethics expected of all pharmacists. In September 2008, the Singapore Pharmacy Council was set up and it now oversees the pledge-taking ceremony.

. healthcare workers
eir fear of the dreaded SARS virus and bravely went about their duties. Of course, it helped that they were provided with protection (as demonstrated in this photograph taken at TTSH) and information on how to avoid infection.

5

Better prepared

Moving to a new century

1995 - 2005

► An apple a day… this decade saw Singapore further push for healthy lifestyles among its people. A good example was childcare centres serving children fruits every day.

As Singapore crossed into the new century, fundamental changes were taking shape. The Ministry of Health (MOH) continued to fine-tune the public healthcare system to better cater to the needs of an ageing population while maintaining its focus on affordability, quality and efficiency.

Rapid growth in capacity was complemented by innovations in services and care delivery, use of information technology as well as programmes to spur research and development in enhancing care and provision of medical services. There were key changes to public education and the promotion of healthy lifestyles.

The effort to optimise efficiency saw changes to the structure of healthcare. Individual hospitals and institutions were reorganised into two vertically integrated clusters. Two new statutory boards, the Health Promotion Board and the Health Sciences Authority, were also created to give new focus and thrust in their respective areas.

But the unrelenting fight against illnesses and disease never let up. SARS (Severe Acute Respiratory Syndrome) tested the nation's medical and social resolve. The lessons learnt from dealing with the disease sparked tectonic shifts in Singapore's preparation to manage new diseases. It also permanently changed the way we viewed handwashing and our awareness of basic hygiene measures.

There were other outbreaks too. Dengue, Hand Foot and Mouth Disease (HFMD), Nipah Virus and H1N1 tested the vigilance and rigour of the public healthcare system like never before. The good news was that the system emerged stronger from each challenge.

There was also the continuing challenge of treating the growing incidence of non-communicable diseases such as stroke, diabetes, cancer, heart diseases, kidney and liver failure. Part of the solution was to educate the public to adopt a healthier lifestyle to pre-empt the onset of these diseases.

Healthcare financing strategies were also refined, mostly in response to the advent of the ageing population and provision for their care.

Changing of the guard

As always, the Government was constantly seeking to better serve public needs and many areas in healthcare were examined in the late 1990s. Mr Koh Yong Guan had come onboard in 1996 as the first Permanent Secretary (PS) for Health who was not medically trained. As a biomedical engineer, he had previously served in the ministries of finance, education and defence, as well as Commissioner of Inland Revenue. He brought an engineer's sensibility to policy-making in his three years on this job.

"I tend to look at organisations, systems, people, financial resources and their efficient allocation… how to make systems and organisations more efficient," he said in an interview for this book. Several projects initiated during his time in office continue to see significant development. For example, the digitising of patients' medical information so that doctors caring for the same patient could access it seamlessly.

Another initiative was the Diagnosis-Related Group, or DRG system, that helped to standardise charges for similar procedures among healthcare providers. The DRG, according to Mr Koh, was also intended to "prevent supply-driven expenditure". He added: "At that time, much expensive diagnostic equipment was just coming on, things like CAT scan, magnetic resonance imaging and there was the question of whether we were over prescribing expensive treatment methods."

Pointing out that he effectively spent only nine months in MOH as he served other portfolios, Mr Koh credited Mr Moses Lee, who was the Second PS for Health from 1997 alongside Mr Koh until he assumed the full portfolio between 1999 and 2005, for doing "all the hard work".

Clustering:
National Healthcare Group (NHG) and Singapore Health Services (SingHealth)

Singapore's pursuit of universal healthcare saw continued refinement to policies and the restructuring of the public healthcare system begun in the mid-1980s. The roles and functions of MOH were refined too.

Corporatisation of the public healthcare sector fitted in well with the Government's long-term plans to focus on a strategic, policy-making role and let market forces drive efficiencies. It also resonated with the long-standing philosophy of personal responsibility, changing the perception that healthcare was a cheap social service to be provided by the Government.

In his interview for this book, Mr Lee, also an engineer by training, said MOH was the most complex ministry he had served in because "no issue stands on its own, everything is interrelated, interlinked" and the very issues that occupy policy-makers today are the ones that prevailed in the past. He called meeting the challenges that these issues presented "a continuous struggle".

He listed these key issues as cost, affordability, quality, planning facilities for future needs, manpower needs, doctors leaving for private practice, and the training of doctors and nurses. "These are issues which I can say every healthcare system in the world grapples with. Not everyone is successful. It's not just about cost and affordability, it's about quality! If you talk about low cost and no quality, then it's not sustainable. It's not acceptable. It's a continuous struggle," he added.

The corporatisation journey, far from smooth or complete, can be seen in this light. Restructuring was completed in late 2000 when Alexandra Hospital (AH), the Institute of Mental Health/ Woodbridge Hospital (IMH/WH) and the government polyclinics were corporatised. While the rationale for restructuring still held, issues and events necessitated a relook at how the restructured entities should be organised and governed. The result was the realignment of the public healthcare system into two vertically integrated clusters, the National Healthcare Group (NHG) and the Singapore Health Services (SingHealth). In essence, this was a move back to tighter coordination and collaboration.

Restructuring had worked, as Mr Lim Hng Kiang, Health Minister and Second Minister for Trade and Industry, pointed out in October 2000. "It freed hospitals from the constraints of civil service rules and allowed hospitals to improve their efficiency and serve their patients better," he said, adding that hospitals had "improved markedly" while the "conducive healing environment contributed to a better patient experience".

But restructuring, which developed hospitals and polyclinics as individual entities, had also led to fragmentation of patient care. Mr Lim described clustering as a turning point in the healthcare system, the main reason being the need to coordinate patient care more efficiently across the whole continuum.

The vertical integration of public healthcare institutions within a cluster would provide seamless care to patients, allowing them to be treated according to the care they needed. This would also ensure better management of resources by the institutions and the cluster.

▲ Cluster muster… in late 2000, the public healthcare system was organised into two vertically integrated clusters, the National Healthcare Group (NHG) and the Singapore Health Services (SingHealth).

In October 2000, the public healthcare system was divided into two clusters, serving the western and eastern parts of Singapore respectively. The NHG cluster comprised the National University Hospital (NUH), Tan Tock Seng Hospital (TTSH), AH, IMH, the National Skin Centre (NSC), National Neuroscience Institute (NNI) and nine polyclinics.

The SingHealth cluster comprised the Singapore General Hospital (SGH), KK Women's and Children's Hospital (KKH), Changi General Hospital (CGH), National Cancer Centre Singapore (NCCS), National Dental Centre (NDC), National Heart Centre Singapore (NHCS), Singapore National Eye Centre (SNEC) and seven polyclinics.

Thus each cluster had been set up with the full spectrum of primary, hospital and specialist centres.

Ang Mo Kio Community Hospital was added to the SingHealth cluster in 2001 but from April 2002, it was run by the Thye Hua Kwan Moral Society and Chee Hoon Kog Moral Promotion Society, both voluntary welfare organisations. NNI was transferred to the SingHealth cluster in 2004.

Each institution within the clusters had its own chief executive officer (CEO), reporting to a cluster CEO. The clusters in turn reported to MOH Holdings Pte Ltd, the new name for the Health Corporation of Singapore, first incorporated in September 1987 as the holding company for the restructured hospitals.

The two clusters would face three challenges, said Mr Lim during the budget debate in Parliament in March 2001. They had to play a greater role in the primary and secondary prevention of diseases, continue to serve subsidised patients well and keep upgrading the skills of doctors even as they trained future generations of doctors.

▼ It worked… Health Minister Lim Hng Kiang (below, during a visit to a polyclinic in Pasir Ris) said in October 2000 that restructuring "allowed hospitals to improve their efficiency and serve their patients better".

Through all these changes, the ultimate target remained in focus: Provide affordable healthcare to the people of Singapore and manage chronic diseases well. These were objectives laid down in the 1993 White Paper. Competition to maximise profit was not one of them.

Mr Lim reiterated this point in his Budget speech. Addressing concerns that the restructuring of public sector hospitals and polyclinics would lead to higher charges as they are, in some people's minds, "private companies out to make a profit", he said: "We restructure so that we can be more efficient, more productive and more responsive."

The same considerations applied to clustering, he added: "I want to make this point explicit. SingHealth and NHG would therefore be repositioned as not-for-profit entities. As not-for-profit entities, their main objective is not to maximise profits, neither are they under pressure to pay dividends to their shareholders. To underscore this "not-for-profit status" the Minister for Finance has agreed to exempt the two clusters from paying corporate tax. Instead, the savings and any surplus generated as a result of their efficiency gains will be ploughed back for medical research, training and patient care."

Deepening care
with new facilities

While MOH and the clusters were adapting to these changes, the levels and standards of care continued to improve, not least through the redevelopment of existing facilities.

IMH/WH had moved into its new premises in Hougang in April 1993, providing a suite of services very different from its old Jalan Woodbridge days. The emphasis now was on modern forms of treatment, training, mental health promotion and research.

The New Changi Hospital in Simei became operational in February 1997. It merged the operations of the old Changi and Toa Payoh hospitals. In March 1998, it was officially opened by then Deputy Prime Minister Lee Hsien Loong and renamed Changi General Hospital. The change of name reflected its status as a regional general hospital – the first hospital to be so designated – serving residents in eastern Singapore.

The NDC commissioned its new premises in March 1997. With 92 dental chairs and six operating theatre suites, it was the largest dental facility in Singapore. The new NCCS opened its new premises in July 1999. TTSH, together with NNI, also moved into its new 15-storey building which was officially opened in April 2000.

◄ The best mental health facility, bar none… the Institute of Mental Health was a very different place from the old Woodbridge Hospital. With the emphasis on modern forms of treatment, the old barred windows and doors of old turned up as decorative art in the heritage garden.

In October 1999, Mr Lim announced that more community hospitals and nursing homes for elderly patients were to be built. In addition, an insurance scheme to defray the high cost of long-term, step-down care would be introduced.

Plans were also announced the same month for the redevelopment of AH into a regional hospital to serve western Singapore. Jurong General Hospital, which was to be completed in 2006 to replace AH, was put on hold. Instead, a hospital for the north of Singapore (today's Khoo Teck Puat Hospital in Yishun) was deemed more urgent. Construction for this hospital began in November 2006 and it opened in June 2010.

The Family Health Service (FHS), comprising the government polyclinics, was restructured in November 2000 to provide polyclinics the autonomy to expand and improve on the range and quality of primary healthcare services. Kandang Kerbau Hospital's role as the premier maternity hospital was enhanced as it took on women's health and consolidated paediatric services in Singapore to better develop paediatric subspeciality care. In 1997, it was renamed KK Women's and Children's Hospital, housed in its new buildings on Bukit Timah Road.

Restructuring and clustering brought a number of benefits. It allowed the clusters flexibility in the way they shaped services and programmes.

In October 2000, a new Group Procurement Office under SingHealth was set up to handle procurement functions for both clusters. This function had so far been handled by the Ministry's National Pharmaceutical Administration. This new move brought cost savings, with bulk purchases of drugs saving the two clusters $12 million in 2002.

NHG introduced three initiatives soon after clustering – the Direct Access Programme which allowed polyclinic patients to be admitted to hospitals in the same clusters without needing to be reassessed at the hospital, a pilot NHG Cancer Programme and NetCare, a healthcare portal for electronic medical records within the cluster. At SingHealth, a link to its electronic medical records system gave the medical staff at its polyclinics access to these records.

92

Number of dental chairs the National Dental Centre Singapore had when it commissioned its new premises in 1997

Parveen Kaur Sidhu, Principal Physiotherapist, Rehabilitation Department, KK Women's and Children's Hospital

Many hands to heal a baby

WHEN people think physiotherapist, the images that usually pop into their heads are therapists helping the elderly or athletes in a rehabilitation gym. I, on the other hand, work with little babies who have come out too early from their mothers' wombs.

It is something I have done since I joined KK Women's and Children's Hospital (KKH) in 2001 after graduating from Nanyang Polytechnic. I had always wanted to work with young patients, and being assigned to the children's ICU and the Neonatal Intensive Care Unit (NICU) gave me that opportunity. Even when I decided to embark on a physiotherapy degree course at the Singapore Institute of Management a year later, I opted for evening classes so that I could continue working. That's how much I love my job.

I am now part of a multi-disciplinary team that looks after premature babies – we call them "preemies" – in the NICU. The team includes doctors, nurses, respiratory therapists, dieticians and pharmacists. It takes our collective skills to help these babies, some of them born as early as 24 weeks (normal human gestation is between 37 and 40 weeks) and weigh as little as 500 grams, sometimes less (average weight of an Asian baby is between 3.2 and 3.5kg).

As a team, our skills complement each other. For instance, the respiratory therapist on my team has skills with a ventilator while I can help with suctioning out phlegm from the babies' air passages. If I know a patient needs a nebuliser, I ask the respiratory therapist to put it on. As for the nurses at the NICU, they are the most hard-working group of people. They are so knowledgeable. They know everything about their patients, from what happened during the night or how they are feeding. When I talk to them about a patient, it is even better than reading the case notes.

The role of ensuring the preemies' health is challenging, but I really enjoy my role as a physiotherapist in their treatment. So much so that I specialised in cardiorespiratory when I went to Melbourne to do my master's in physiotherapy about five years ago.

When I returned to work a year later, I was equipped to train new nurses on how to clear out the preemies' air passages and tracheal tubes. Once they are trained, I monitor their work and find the role of trainer very satisfying too.

The doctors, nurses, physiotherapists and respiratory therapists are the main people who handle the preemies and that is done with team care. If the nurse needs to change a diaper, she won't touch the baby until the physiotherapist suctions out the phlegm from the baby's air passages and turns the baby onto its side. As the baby is turned, the nurse cleans it and changes the diaper. After that we don't touch the baby for four to five hours because preemies are unstable and should not be handled so much. It's a double-edged sword for us: We need to make sure their airways are clear and they are clean but they can't be handled too much.

The dietician and pharmacist help by making recommendations for medication and monitoring the patients' weight and nutrition respectively. When the team meets in the morning, the doctor discusses each case and updates everyone on the plans for the day. Everyone's contribution enhances the management of the patients. We are diverse but our individual role is very important and we respect each other. It takes many hands to raise a baby out of the NICU.

In this job, you experience triumph and heartbreak, sometimes on the same day. While it is hard to see my little patients struggle to grow, and sometimes they lose the fight when they can't beat an infection, there are happy moments when some of them are well enough to go home with their parents. We train the parents to look after their preemies, like feeding them through tubes and using the mechanical ventilator to help them breathe. Nowadays, parents are so empowered, they are free to take their babies home straight from the NICU if they feel they can manage the care. After 15 years in this job, one of the nicest feelings for all of us in the team is to see a "graduate" from NICU running around when they come back for a visit.

It takes a team... Principal Physiotherapist Parveen Kaur Sidhu (back row) is part of the NICU's multi-disciplinary team that cares for KKH's premature babies.

Mr Khaw Boon Wan, who had taken over from Mr Lim as Acting Health Minister in 2003, said the clusters were also cooperating to promote healthcare careers and facilitating cross-cluster training of young medical officers. He also suggested that the clusters could cooperate in additional areas like giving patients the freedom to move seamlessly between them. This could be achieved by sharing medical records and allowing their computers to "talk to one another so that we can more quickly work towards all Singaporeans having their own electronic medical records".

In an interview for this book, former Senior Minister of State Dr Aline Wong, who retired from politics in 2001, assessed clustering and the rapid capacity expansion as necessary steps in the journey to bring Singapore's public healthcare to its present laudable state. Dr Wong had chaired the Review Committee on National Health Policies in 1991. Its report eventually formed the basis for the seminal White Paper on Affordable Health Care in 1993.

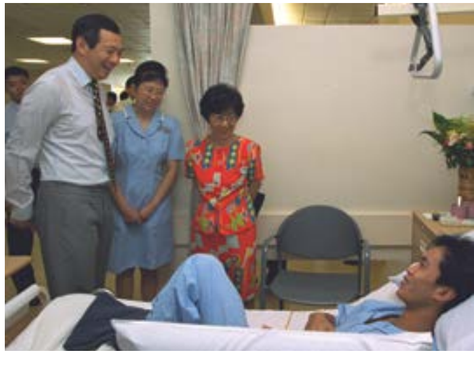
Using her perspective as a sociologist, as well as the benefit of hindsight 14 years after retiring from political office, she said the Government had been true to its principles of providing accessible, affordable healthcare, even as the system was being reshaped. Pieces fell into place like a giant jigsaw puzzle, each piece put into place by successive generations of policy-makers.

"Medisave was introduced to implement the principle of co-payment. With restructuring, you got to work like the private sector… introduce a different kind of price control, because we cannot just go into a system where 80 percent or 90 percent (of bills) are subsidised," she said.

"We wanted to upgrade the services, we wanted to introduce choice. Medisave came in handy. Now the system is in place. So restructuring of the hospitals began in 1985, and in 1987 the Health Corporation of Singapore was formed. At that time we were

▲ Let's work together… Health Minister Khaw Boon Wan (top, during a community visit in 2004) wanted a system where patients could move seamlessly between the clusters.

▼ Saving for a rainy day… Senior Minister of State for Health Dr Aline Wong (below, visiting a patient at the opening of Changi Hospital with then Deputy Prime Minister Lee Hsien Loong in 1998) said Medisave was introduced "to implement the principle of co-payment".



► Elementary, my dear Watson… the Health Sciences Authority houses our nation's Sherlocks of science and set up the DNA Database Laboratory in collaboration with the Singapore Police Force.

▲ Healthy workers, happy workers… the Health Promotion Board's Active Day campaign spurred many companies to encourage their employees to adopt a healthy lifestyle. This "fill-in-the-blanks"-style poster released in 2005 helped companies inform staff about the next Active Day event.

really groping in the dark. We had no experience, we had no other examples from other countries to follow. There is a holding company that hosts restructured hospitals. What is its relationship with the Government, with MOH? What does it do with its revenue, its profit? So it was a whole new experiment altogether, it was a very bold attempt to try and understand how things work."

Restructuring also came with rapid development of public healthcare institutions, she added.

"NUH, NHCS, NDC, NCCS… all came up. So at the same time as restructuring, you have redevelopment. At that time it created a lot of apprehension. With a new building, people say there is an excuse for the Government to jack up the charges, because it has to recover the cost.

"But actually people didn't realise that the buildings, the land, were all really taken care of. It's really your operating costs, your manpower costs, your medication costs and technology which affect the quality of your services. It's not your infrastructure. So it's got nothing to do with the new buildings. But the new buildings were so nice. I felt completely bowled over," she said.

Dr Wong, who laid the foundation stone for KKH, felt the investment in new infrastructure was worthwhile. The old Kandang Kerbau Hospital was a sprawling colonial building which she had visited as a patient. The new KKH had become a model healthcare facility, devoted to women and children.

She said it was the same experience with Woodbridge Hospital: "It was so depressing, the old one. It was like a prison. And then came the new Woodbridge Hospital… I followed DPM (Lee Hsien Loong) to open IMH and my heart leapt. Look at the patients, they are people who really deserve these kinds of new facilities. So it was very uplifting, it was a wonderful thing we developed."

Sharpening regulation and health promotion

While public attention was focused on the intricacies of clustering and its benefits, MOH started looking at the regulation of health products and health education. It did so by forming two statutory boards on 1 April 2001 – the Health Promotion Board (HPB) and the Health Sciences Authority (HSA).

Putting the HPB Bill through its reading in Parliament, Mr Lim said HPB would "spearhead health education, promotion and prevention programmes and create a supportive environment" to tackle major health problems in children, adults and the elderly. He cited many health issues, like dental health and myopia among children, obesity, smoking, high blood pressure due to unhealthy lifestyles, breast cancer and osteoporosis, which needed a "more focused, integrated and concentrated approach" to get the desired health outcomes.

HPB would also work with public, private and community organisations to develop and sustain national health education programmes to promote good health and healthy lifestyles as well as prevent and detect diseases. It would establish guidelines on diet and nutrition too, encouraging healthy eating habits. A third function would be to provide medical, dental, health screening and immunisation services to school children.

It would also ensure more efficient use of financial and manpower resources as well as "strengthen the capacity and capability to develop, implement, monitor and evaluate these programmes", said Mr Lim.

HSA integrated five specialised departments in MOH: The Centre for Drug Evaluation, Institute of Science and Forensic Medicine, National Pharmaceutical Administration, Product Regulation Department and the Singapore Blood Transfusion Service. These were initially constituted as eight centres in the new statutory board and later streamlined into three professional and scientific groups in 2006.

The Health Products Regulation Group ensures that all medicines, medical devices and health products in Singapore meet internationally benchmarked standards through appropriate pre-and post-market measures.

The Blood Services Group oversees the National Blood Programme and Bloodbank@HSA, protecting the country's blood supply and ensuring the safety of blood and blood products supplied to hospitals in Singapore.

Largely supporting the courts and law enforcement agencies, the Applied Sciences Group acts as a repository of the national expertise in forensic medicine, forensic science and analytical chemistry-testing capabilities. It provides forensic and consultancy services for criminal and medico-legal investigations and civil disputes, as well as analytical testing laboratories for scientific and investigation services for the Government and private organisations.

Explaining the need for the HSA in Parliament in February 2001, Mr Lim said the five original departments had "achieved professional excellence in many of these areas of expertise and have been accorded international recognition".

HSA would thus "ensure the continued presence of a strong and progressive regulatory and scientific agency… in an era of rapid change in medical practice and increasing complexity of regulatory issues". As a statutory board, HSA would also have more autonomy to develop the services provided as well as attract and retain the necessary expertise in these highly specialised fields.

Indeed, as Mr Lim mentioned, the reputation of HSA's constituent departments was well known both at home and abroad. A good example was the work of the forensic pathology service, embodied in the person of the late Professor Chao Tzee Cheng, Senior Forensic Pathologist at MOH at the time of his death in 2000.

Professor Chao brought to his role an uncanny ability to solve unusual cases. For example the Adrian Lim cult murders of 1981, the Flor Contemplacion murder case of 1991 and the John Martin Scripps body parts case in 1996. In fact, he even titled his book Murder Is My Business. Of all his many cases, the Flor Contemplacion case was especially sensitive as it threatened to sour relations between Singapore and the Philippines.

Contemplacion, a Filipino domestic helper, had

Cheerful touch to noble act

The next time you see someone with a colourful bandage (like the three pictured here) on their elbow, thank them for being a blood donor! In 2003, inspired by what was being done by their counterparts in the United States, the Health Sciences Authority (HSA) started using colourful bandages to stop the minor bleeding after the needle is removed from the vein after the donation. The bands, which come in many colours and designs and replaced the film dressing with a non-adherent pad used till then, were HSA's way of adding a cheerful touch to the act of blood donation.

Singapore's Sherlocks of science

Professor Bosco Chen Bloodworth,
Senior Scientific Advisor, Health Sciences Authority

Keeping one step ahead of the bad guys

THE Health Sciences Authority (HSA) has three main functions – the national Blood Service, Applied Sciences (which includes Singapore's forensic or "CSI" and other scientific testing laboratories), and Health Products Regulation. A lot of the scientific work I have been involved in is not well known to the public since our work is done in laboratories and is very specialised in nature. All that matters is that what we do helps protect the public.

When I joined the Department of Scientific Services (which later became a part of HSA) as a scientific officer in the 1980s, we were considered the government chemists. At the time, most ministries did not have a scientific arm so we provided scientific support to them.

Initially the department resided in the Ministry of Science and Technology which started in 1968. Later, when the Ministry closed in 1981, the department came under the Ministry of Health. By the late 1990s, all our laboratories were accredited and, as one of the old timers in the service, I've gone through almost all of them: I've done food analysis, pharmaceutical analysis, narcotic analysis and weapons toxicology.

That said, the challenges of the job now aren't too different from when I started out. The main challenge is to keep one step ahead of the bad guys who can use sophisticated science to produce fake or dangerous medicines. You are never sure when whatever testing method you are using may not be good enough... then you have to come up with something better.

A good example is the Slim 10 case, for which I gave evidence in court. This was an illegal, toxic "slimming" supplement which made headlines in Singapore in 2002 with one fatality and a high-profile liver transplant for a TV star.

Because it was so toxic, you vomited when you took it. That made you lose a lot of weight, hence the "slimming". So a lot of people thought it was very effective. But it caused a lot of trauma to the body and damaged the liver as well. It was the first case where the manufacturers manipulated the molecules; somebody was clever enough to change the drug's molecular structure. From that experience, we realised that you can't just do a regular screening because people change things to evade these types of screenings.

We published our findings in international scientific publications and informed others in our field via our international activities about these adulterants in health supplements. As a result, other countries did follow-up work and now it has become a worldwide issue with a lot of sharing of information.

The criminals around the world are also getting clever. They are able to copy pharmaceutical drugs in the market and manufacture large quantities for the black market. As we have the chemistry and technological skills, so does the "dark side". But we are committed to staying ahead and protecting the public.

Associate Professor Chan Cheng Leng,
Deputy Group Director, Health Products Regulation Group,
Health Sciences Authority

Vigilance at all levels

PRIOR to the Slim 10 incident, there was already a regulatory framework for Chinese Proprietary Medicines (CPM) in place. As these products are considered generally low-risk health products, the pre-market requirements before they go on sale are less stringent compared to the higher-risk pharmaceutical products. So at HSA, we also monitor these items after they have been cleared for sale. We keep track of adverse drug reaction reports from healthcare professionals and test samples of the products for adulterants, toxic heavy metals (for example mercury, lead or arsenic) and microbial contamination. The legislation for the controls of CPM was gazetted under the Medicines Act in September 1998.

We further tightened controls after 2002 and now every batch of CPM brought into Singapore must be tested for adulterants and toxic heavy metals. Our system of ensuring the purity of items after they have hit the shelves is highly regarded globally and our adverse drug reporting has been ranked No.1 in the world by the World Health Organisation because of the extent to which we can pick up signals in our population. It's an accolade we are proud of and the more developed agencies in Japan, Europe and the United States take our alerts very seriously.

We take a holistic approach to protecting the public through our healthcare professionals and the media by sending them frequent alerts about illegal health products. Singaporeans are generally aware of the dangers but sometimes they think it's not going to happen to them. In 2008, a man who consumed the illegal sexual enhancement drug Power 1 Walnut saw his doctor three times for the same adverse drug reaction. He told his doctor that he knew about the dangers but "didn't think it would happen again".

We now work with the Health Promotion Board, using its grassroots network to inform the public about the dangers of using illegal slimming pills or sexual enhancement drugs.

The Internet poses a huge challenge for us too. We did a study in 2008 of health products sold online and found that about 60 percent of them were either counterfeit or substandard. This is similar to other studies done internationally. So we now work with local websites to counter this problem, educating the website administrators on the regulatory controls for health products. They have been co-operative and help by removing postings of unregistered health products like some types of thermometers or medicinal products from their sites. They also post advisories on their website to inform the sellers about our requirements.

We will certainly do our part but the "caveat emptor" or "buyer beware" principle also applies – consumers must make wise choices and not jeopardise their health by consuming products from risky sources.

been convicted of murdering another maid, Ms Della Maga, and Nicholas Huang, a child under the latter's care. She was convicted and sentenced to death by hanging in 1994. Appeals for clemency from Filipino President Fidel Ramos to President Ong Teng Cheong were rejected. But the Government agreed to re-examine Ms Maga's remains. Under great pressure due to the political sensitivity, Professor Chao and his forensic team stood firmly by their original findings that she had been strangled to death.

Dr Michael M. Baden, a member of the independent team of American experts which reviewed the case and upheld the findings of the Singapore forensic team, had this to say of Prof Chao: "Despite all the contradictory claims, it was clear that he was right. He was working under tremendous pressure, given the political dimension of the case. It is a rare individual who can remain so completely focused against a backdrop of such intense political pressure.

"The goal of all scientists is that the truth comes out, and that political considerations cannot supercede the truth. His desire for truth was absolute. He was a good person to work with – everything was truth-driven, no deception, no game playing."

HSA's role in protecting public health, through drug regulation and enforcement against illegal drugs, would also continue to grow over the years, particularly in a highly open, trade-dependent economy such as Singapore's. This was well-illustrated by the Slim 10 saga.

▲ Move over, CSI... here comes HSA. Forensic scientists from the Health Sciences Authority (HSA) assist the police on the recognition, collection and preservation of evidence at crime scenes.

Tightening medical ethics, giving laws more bite

The decade also saw MOH tightening the principles and laws governing ethics, professionalism and the practice of medical care.

The right of persons to choose in advance not to have extraordinary treatment to prolong their lives if they were terminally ill and had lost consciousness became law when the Advanced

"At least the TCM community… should point out who the charlatans are, who are those who are trained and who are those who are not trained or who are not properly trained. They should identify themselves and discipline those of their members who are quacks and who are unprofessional."

Health Minister George Yeo, speaking about Traditional Chinese Medicine (TCM) in the March 1995 Budget debate. He recognised TCM's value and knew it was tough to integrate it with western medicine

Medical Directive (AMD) Act was passed in May 1996 and came into effect in July 1997.

The passage of the Bill through Parliament occasioned lively debates. Public views were also submitted to a Select Committee. Discussion focused on the meaning of terms like "living wills", "brain dead", "terminally ill" as well as concerns raised over issues like euthanasia and the possibility that the AMD would unwittingly "provide opportunity… for illegal trafficking or sale of human organs".

Then Health Minister George Yeo assured Members of Parliament (MPs) that the Government had consulted all sectors of society over two years and incorporated views where possible. He said the Bill "allows those who feel strongly about their own wishes to state them in advance so that doctors and family members will know when the time comes and this removes the heavy burden for those who have to make the decision anyway". The Bill was passed at its third reading after MPs generally spoke up in its support.

Traditional Chinese Medicine (TCM), which had been a fixture in Singapore since its founding, saw the establishment of a framework for registration in the 1990s.

In the March 1995 Budget debate in Parliament, Mr Yeo said he had raised the issue the previous year but recognised that the integration of TCM and western medicine was difficult even in traditional bastions of TCM such as China, Japan, Korea, Taiwan and Hong Kong. He acknowledged the merits of TCM, such as its holistic approach to treatment.

"It is a precious heritage which had given tremendous medical support to many generations of Singaporeans over the years. All these Chinese sinsehs in Tong Chai Hospital, the Buddhist Federation, the clinics in Toa Payoh and elsewhere, every day they are seeing thousands of Singaporeans almost for free. They have given sterling service over all these years for which we should be very grateful," he said.

He also urged the TCM community to practise self regulation: "At least the TCM community… should point out who the charlatans are, who are those who are trained and who are those who are not trained or who are not properly trained. They should identify themselves and discipline those of their members who are quacks and who are unprofessional."

MOH wanted to proceed carefully and had sought advice from the World Health Organisation. A Committee on Traditional Chinese Medicine headed by Dr Aline Wong was also set up in 1994. From there, things moved quickly.

An acupuncture research clinic, the first in a public hospital, was set up in the Ang Mo Kio Community Hospital in 1995, followed by a second clinic in AH in 1996. A year later, TTSH set up a Complementary Integrative Medicine Clinic.

Legislation was introduced to ensure standards in TCM practice. The Traditional Chinese Medicine Practitioners Act, passed in November 2000, required all TCM practitioners to be registered with the TCM Practitioners Board. The Board also accredited TCM schools and courses, and regulated the professional conduct and ethics of practitioners. An Ethical Code and Ethical Guidelines for TCM Practitioners was established to ensure minimum standards of practice and professionalism.

Changes also took place in medical specialist registration. The Medical Registration Act was revised in 1997 to pave the way for the Specialist Accreditation Board and the Specialist Register to be set up. The idea of a Family Physician Register was mooted in 2005 and eventually created in 2011.

▼ Need to control needles… Acupuncture got a boost in November 2000 when all TCM practitioners had to be registered under the Traditional Chinese Medicine Practitioners Act.

R&D drive for practical applications

In 1994, the search for cost-effective treatments had led to the formation of the National Medical Research Council (NMRC), as provided for in the 1993 White Paper on Affordable Health Care. It comprised representatives from MOH, the Ministry of Education and the National University of Singapore. Its role was to "disburse R&D (research and development) funds and to approve, oversee and co-ordinate medical research in the various hospitals, centres and institutions".

The medical community welcomed the idea as it would encourage the pooling of ideas and sharing of medical expertise. The NMRC's impact was quickly felt. Between 1994 and 1996, it received $80 million to fund research. As the interest in medical research grew, the Government pledged to match public donations dollar for dollar, up to $40 million. The Health Research Endowment Fund, set up in April 2000, would add to the $50 million a year given out by the NMRC.

One of the first research grants went to IMH for a survey on the state of mental health in Singapore. The National Mental Health Survey was conducted between 2002 and 2003. IMH eventually set up a Research Division to boost its R&D capability in mental health with an Institutional Block Grant from the NMRC in 2000.

The Clinical Trials and Epidemiological Research Unit was set up to support the design and conduct of clinical trials, epidemiological and related studies in Singapore in 1996. Funding was also provided to build research infrastructure, such as the laboratories, clinics, teaching facilities and treatment rooms set up in NCCS in 1999.

The availability of R&D funding encouraged more doctors to venture into research, from 172 in 1994 to 213 in 1996, while the number of scientists doing research with doctors increased from 32 to 47 over the same period. The number of research projects also rose quickly – from 46 a year between 1990 and 1993 to about 70 a year between 1994 and 1996.

Research in nursing was encouraged too with a $50,000 grant to set up a resource centre to encourage research projects.

To help hospitals develop new medical capabilities and services, $20 million was set aside every year under the new Health Service Development Programme, which kicked off in April 2001.

The NHG and SingHealth clusters were also given direct research grants, each worth $5 million, from April 2001. Called the Cluster Research Fund, this sum was in addition to the NMRC grant that each cluster was receiving from the Ministry. In addition, $23 million was also set aside for postgraduate training in the clusters in 2001.

This focus on translational research in medicine was set against the larger government goal of restructuring the Singapore economy to drive future economic growth, one of the key drivers being the biomedical science industry. Launched in 2000, the first five years of the biomedical sciences drive started with the building of basic science research capabilities. The one-north science hub in Buona Vista, launched in 2001, was conceptualised as a global talent hub. It was a major step forward for Singapore into a knowledge

▲ Funding the future… thanks to grants from the National Medical Research Council, research facilities like the National Cancer Centre (above, exploring how the natural fluoresence of cells, which change when they become cancerous, could be used to reduce painful biopsies in cancer detection) were born.

Mrs Dorothy Chin, mother to Singapore's first quintuplets

One, two, three, four... wait, there's one more!

WHEN we were expecting the children, we thought we were having quadruplets. Even during the delivery at KK Women's and Children's Hospital (KKH), the doctors and nurses were also prepared to deal with quadruplets. With my gynaecologist, the late Dr Ratna Mitra, by my side, I was confident the delivery was in good hands.

Then came the surprise... a fifth baby! As I was awake during the entire Caesarean section, I could sense the flurry of activity and commotion in the operating theatre. Even though they were caught by surprise, the KKH care team reacted quickly and was able to immediately activate additional medical support for the fifth baby.

My family and I are still grateful for the care team's support and encouragement as we slowly came to terms with the surprise of giving birth to quintuplets on 1 April 1997. As the babies – Adriel, Alicia, Amanda, Annabelle and Andre – were born at a gestational age of 32 weeks, the team took care of them 24/7 at the Neonatal Intensive Care Unit (NICU). As premature babies, they had to be placed in incubators where their temperature was monitored. They also needed help to breathe through ventilators and were fed through tubes. They were so small and delicate, but the NICU team took excellent care of them for about three months till they were strong enough to go home.

Apart from that overwhelming surprise, one of the more memorable moments of my pregnancy was moving to the new KKH at Bukit Timah Road before I gave birth. I was apprehensive but felt honoured to be part of the history of both the old and new KKH. As all the patients in the ward were transferred to the new KKH by the care team, it felt like we were moving house albeit on a larger scale. And, of course, I had the privilege to enjoy a brand new ward, bed and amenities.

Dr Mitra was my pillar of support throughout my pregnancy. Due to the added complexities of a multiple birth, she monitored me closely and when I was admitted to KKH during my second trimester, it proved to be instrumental in ensuring my overall well-being during the pregnancy. We had especially good experiences with the doctors, nurses and other allied health professionals at the hospital.

Till this day, the family keeps in contact with the KKH medical professionals and staff. We even worked together on a book titled Our Amazing Quins.
I wrote it, chronicling my journey as the mother of the first set of quintuplets in Singapore, and KKH published it. The book was launched in July 2013 during the opening of KKH's new NICU and we pledged the book's sale proceeds to the hospital's Health Endowment Fund.

People always ask me how we coped with quintuplets in their first few years. All I can say is that we had the total support of our extended family. My mother-in-law stayed with us on weekdays to help care for the children. When she passed away in 2006, my mother moved in to help. I also took a year of no-pay leave. I eventually left my full-time job in the armed forces when the children were in Primary 5.

When it came to travel, as you can imagine, it was like planning a military operation. We started going to Malaysia when the children were three years old as we wanted them to learn how to take care of themselves and be travel smart. But, for us adults, a lot of detailed logistics planning was required: Prepare a tin of milk powder, steriliser, medicine, travel insurance and of course pack for five toddlers.

Now that they are teenagers, it is more challenging keeping up with their different school schedules and personalities. In their early years, we ensured that the children developed their own personalities. We didn't dress them alike as we felt they needed to grow into individuals who are confident of themselves, their needs and aspirations. We felt that, given their unique abilities, they should decide on the type of education and hobbies they want to pursue as well as the friends they want to keep. All five have distinct personalities and I can tell you it is always noisy in our home.

As for the publicity about being the first quintuplets in Singapore, they do find it a bit awkward when friends see them on television or in the newspapers. But I think they are dealing with it as best as they can. They know they are living proof of how good Singapore's healthcare system is.

◄ Five times the joy... Mrs Chin and her husband Humphrey with their newborn quintuplets in 1997.

and innovation-intensive economy and became a magnet for biomedical research facilities.

Facilities included the $500 million Biopolis research complex. The Singapore BioImaging Consortium was established by the Agency for Science, Technology and Research (A*STAR) in August 2004 to serve as a focal point for stimulating, funding, coordinating and reporting on the various bioimaging activities in Singapore. HSA moved its regulatory group to Biopolis in 2004 to be more accessible to the biomedical research community.

The Chemical Synthesis Laboratory, set up in 2005, focused on devising ways to make specific drugs or develop new chemical reactions. The Genome Institute of Singapore and the Institute of Molecular and Cell Biology became part of the complex in 2006. As the biomedical industry grew to make up about five percent of Singapore's gross domestic product in 2005, there was a growing recognition that a new breed of research-trained doctors were needed to make full use of the knowledge, facilities and funding available.

A new breed of clinician-scientists

Singapore's developing biomedical sector required a critical mass of clinician-scientists who could bridge the gap between doctors treating patients and scientists working to discover cures in the laboratories.

A fund was set up by the Biomedical Research Council of A*STAR and the NMRC in 2004 to attract and groom this rare breed of highly trained individuals. Under a scheme called the Clinician-Scientist Investigatorship, a joint review panel was formed to assess applicants.

A new award, the Clinician-Scientist Investigator Award, was created to encourage doctors to take up research and their employers to allow them to do so. The award would pay a proportion of the salaries of outstanding doctors engaged in research and clinical work for five years. This gave them protected time in research, aimed at preventing the burnout often encountered when clinicians juggled a full patient load and research work. The award also strengthened the incentive to

$500 million

Amount spent by the Government to set up the Biopolis research complex

remain in the public sector. Other plans to expand the number of clinician-scientists include A*STAR's MBBS-PhD scholarships launched in 2004.

While the spotlight was on R&D, the need for doctors to update their skills and keep up with changes was not neglected. The Singapore Medical Council made continuing education compulsory under the Continuing Medical Education scheme in January 2003.

Many firsts achieved

The encouragement to pursue training, innovation and research led to doctors and hospitals scoring many medical breakthroughs.

In December 1995, SGH became the first hospital in the world to perform a peripheral blood stem cell transplant in a Thalassaemia patient from an unrelated matched donor. In November 2000, surgeons at NHCS performed Singapore's first lung transplant operation on Thanvanthri N. Veerappan, a 54-year-old shipping consultant. Then there was the successful operation to separate 10-month-old Nepalese twins Ganga and Jamuna in SGH in April 2001.

The autonomy provided by restructuring also spurred innovation and research. In 2005, the Singapore Cord Blood Bank, Southeast Asia's first accredited public cord blood bank, was set up in response to the demand from paediatricians and haematologists in Singapore.

Healthcare plugs into IT

Vast amounts of data were being generated by healthcare. Information technology (IT) was harnessed to enhance automation, knowledge management and business processes. The aim was to improve quality of care, reduce costs and address the growing number of challenges resulting from Singapore's tight labour market, increased patient expectations, the growing use of hi-tech medical equipment and the ageing population.

IT was used to provide a more seamless flow of information through point-of-care applications over wireless technology and Smart Messaging Services (SMS). It is now routine for patients to receive a reminder via SMS for their appointments while SMS helps with queue management at specialist outpatient clinics.

The 2000s saw many innovative IT systems being introduced in the public healthcare system. For example, the major hospitals worked on building a filmless environment in diagnostic radiology. SGH built a mobile motorised X-ray light box that combined a patient's electronic medical records with his digital images. This allowed doctors to use it at the bedside for a more immediate and personal consultation.

Robotics played a part in improving efficiency and safety, especially for laboratory staff. At TTSH and NUH, robots provided automatic handling of specimens, preparation steps and movement to different analysers and storage of laboratory specimens. They were the most sophisticated of their kind at the time. Turnaround time for tests also sped up, in some instances at twice the usual speed. This has enabled faster diagnosis and even more timely intervention and treatment for patients.

NHG's ePrescribing System used robots to automate the picking and packing of drugs at the outpatient pharmacy, speeding up the work and improving accuracy. The latest version, the Outpatient Pharmacy Automation System, is the region's first to combine different packaging machines for drugs in blister packs, boxes and loose form into one system.

NUH developed a doctor-centred, patient-based Computerised Patient Support System (CPSS) to enable an integrated view of a patient's data from multiple sources such as X-rays, laboratory results, surgical operation notes, discharge summaries, clinical results and reports. It has led to increased effectiveness and collaborative care amongst multi-disciplinary healthcare teams leading to safer and better patient care. CPSS was awarded the Asian Hospital Management Awards 2003, IT category, in the Asia Pacific.

SGH was rewarded for its innovative use of IT when it won the Infocomm Development Authority of Singapore's Enterprising Agency Award in April 2004 for its pilot Automated Wireless Temperature Surveillance System. The system monitors a patient's temperature continuously and transmits the data to a central system automatically.

"The truth must be known in order that Singaporeans do not lose faith in their institutions and in the system of public administration in Singapore. The Select Committee has been able to settle the issue of health care costs and subsidies conclusively."

Health Minister George Yeo responding to criticism from the opposition in Parliament

Fine-tuning healthcare financing

An increasingly sophisticated population, the changing patterns of diseases and illnesses and the emergence of new diseases made it crucial to look at the healthcare financing model again.

This came on the back of an opposition party claiming that "health care costs are hardly subsidised at all" in one of its 1996 newsletters. The claim was repeated in Parliament, leading to the question of whether treatment in the polyclinics and hospitals was subsidised being put before a Select Committee and MOH being subjected to a thorough audit by the Auditor-General.

The report of the Select Committee and the results of the audit were submitted in Parliament and debated in October 1996.

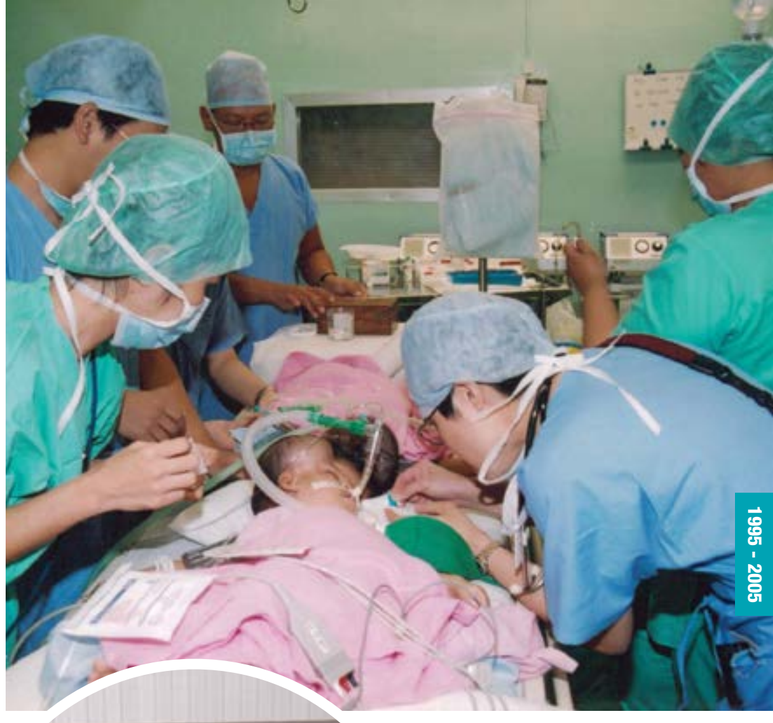
Minister George Yeo put up a stout defence of the accuracy of the subsidies and of the work of MOH officials. He said he understood and shared "the public concern that healthcare in Singapore should always be kept affordable (and) it is the responsibility of the Government to ensure that all Singaporeans have access to good quality basic health services at affordable prices, and to ensure that no Singaporean is ever denied healthcare because of his inability to pay".

At the end of the day, Mr Yeo said that he welcomed the public scrutiny and that the time and effort to convene the Select Committee to get at the truth was necessary: "The truth must be known in order that Singaporeans do not lose faith in their institutions and in the system of public administration in Singapore. The Select Committee has been able to settle the issue of healthcare costs and subsidies conclusively."

Eventually, Parliament accepted that MOH's figures for fees charged by the polyclinics and private general practitioners were correct, as were the subsidy levels for services provided by the polyclinics and hospitals.

Medisave got a reboot too. The range of services that it could be used for were extended to cancer and cancer-related treatment. The type of institutions where it could be used was also widened. It also became applicable to community hospitals like Ren Ci Hospital and approved private hospitals. All classes of wards were covered too, subject to the same maximum limits.

Since 2002, government subsidies and the 3Ms



▲ No separation pangs… in yet another medical breakthrough for the nation, doctors from Singapore General Hospital performed a marathon 97-hour operation in 2001 to separate 18-month-old conjoined Nepalese twins Ganga and Jamuna. The girls (inset, with their grandparents a few months later) were born joined at the head and survived the operation. However, in 2008, Ganga died after a bout of meningitis.

Elaine Chew, Home Care Nurse, Ang Mo Kio-Thye Hua Kwan Community Hospital

Home care goes beyond just nursing

LITTLE did I think when I was working as an air-force technician and contemplating a career shift to nursing in 2011 that I would be working with patients in what I call the "raw" environment. As a home care nurse, I see patients who are in the comfort of their homes but still need to have wounds cleaned or suctioned, feeding and urine tubes changed and medications organised for them.

Most patients think the road to recovery begins when they are discharged from hospital. They are right, but for some of them that road can be longer and more challenging. And that's where we home care nurses come in. We assess the environment to see how the patient is coping and make referrals to the home care doctors or therapists, depending on what is needed. Sometimes, if the patient has a domestic helper, we assess if the helper is competent enough to handle basic feeding and changing of tubes.

Occasionally we also do a bit of case management. For example, if the patient's family is going overseas for a holiday or their block is under renovation, we help them source for respite care where the patient stays in a nursing home for a short period of time. If the patients have financial difficulties to pay for their medical and nutritional needs or need wheelchairs or walking frames, we work with our therapists and medical social workers to try and help them.

One of my patients is battling cancer and bed-bound. She needs a lot of care – feeding, showering and turning over to prevent bed sores – and has a domestic helper who attends to her needs. Her mother and mother-in-law take turns to care for her two very young school-going children. As she is 40, and most funding goes to older folks, she is not eligible for financial assistance. This means her husband has to work extra hard to make ends meet. Fortunately we have kind patients who donate items they don't need any more, like adult diapers, which we pass on to this lady.

This patient is an exception though. Most of my patients are much older and their main caregivers are also of similar age. I have an 85-year-old male patient who is looked after by his 80-year-old wife. Another patient, a 70-year-old woman who is bed-bound, is cared for by her 80-year-old husband. They have a daughter suffering from a mental illness. She can't look after herself, much less look after them. As this man gets older, he worries about what would happen if he should go first. It's a very tough situation for him.

When I go into the homes, I teach the caregivers and even the patients to handle their basic care. I want to help them help themselves because every time we go in, there is a charge. We home nurses also see a lot of caregiver stress. Often, they are frustrated and call to vent their anger. I deal with them with a lot of patience, trying to provide solutions to their problems. In fact, when I visit my patients, I always ask their family members how they are doing. Many of them are surprised as they don't expect that from us nurses. I always remind the caregivers to take care of themselves and try to keep their spirits up.

Some of my regular patients treat me like a confidante, especially when they cannot do things on their own. Many of them are illiterate and ask me to read their letters. Recently some of them asked me to help collect their SG50 transport vouchers for them. Others give me their bank book saying "Ah Moi, you help me to see, Government got give top-up or not?". (Ah Moi, can you help me check if I have received the top-up from the Government?)

I have no regrets about switching to nursing after 10 years as a Singapore Air Force technician. Having signed up for the Professional Conversion Programme for Registered Nurses, I got my nursing diploma from Nanyang Polytechnic after two years and was bonded to the National University Hospital (NUH) for three years as a surgical nurse. It was during this stint that I saw people going home from the hospital without a good support system, without good resources. As my care for them ended at the NUH doors, I always wondered how they were going to cope at home.

Once I completed my bond, I wanted to experience more aspects of nursing and applied to join the home care programme at Ang Mo Kio-Thye Hua Kwan Hospital. Now, after a year as a home care nurse, I can truly say that I get a lot of satisfaction from the job. Not only do we home nurses play a very vital role in keeping people out of the hospital, we also let them have the pleasure of recovering in the comfort of their homes.

◄ From tech to care... Home nurse Elaine Chew made a mid-career switch to nursing after a decade as an Air Force radar technician.

– Medisave, MediShield and Medifund – had accounted for between 32 percent and 39 percent of total healthcare spending in Singapore. In a radical departure from established practice, then Acting Health Minister Khaw Boon Wan announced that MOH would set up a chart comparing charges by public and private hospitals to enable patients to make more informed choices. This was available online by May 2004.

MediShield Plus, an upgrade created for members wishing for more comprehensive coverage than the basic C and B2 wards, was hived off from the Central Provident Fund Board in 2005. It would be run by private insurance providers as Integrated Shield Plans (IPs). Whilst IP policyholders continued to be covered by basic MediShield, they could also receive additional cover for A and B1 wards in public hospitals or for private hospitals. Medisave could also be used to pay for IP premiums, subject to limits.

Looking back, Mr Moses Lee said the 3Ms "are always works in progress… If you look back at the files, we were reviewing Medisave contributions, minimum sum, maximum contribution, MediShield scheme, trying to enhance it to make sure that with MediShield, people can pay for their medical cost until end of life".

As for Medifund, the Government has been topping it up and "making sure that we are using the fund to pay for those who truly cannot afford it. We are quite proud that we launched ElderShield because we recognised that eventually individuals will reach a stage where they cannot manage themselves but they and their families still need the funding to look after them. I recall these are the major plans that we introduced in order to deal with the problems of cost and affordability," he added.

State of Singapore's health

As more hospitals were restructured, MOH's focus shifted from the operational aspects of health service provision to the monitoring of health and healthcare outcomes, and strategising and planning to tackle future healthcare problems. The State of Health 1997 report, issued by the then Director of Medical Services Dr Chen Ai Ju, highlighted major trends and challenges that Singapore would face. These included the ageing

32 to 39

Percentage of total healthcare spending in Singapore that was from government subsidies and the 3Ms – Medisave, MediShield and Medifund – from 2002 to 2011

▼ Preparing for ageing… caring for the ageing population did not just stop at clinical settings and nursing homes (below), they also extended to home visits (above).

population and increasing incidence of chronic conditions.

In particular, the report noted that, in 1997, non-communicable diseases such as cancer, heart disease and cerebrovascular disease were the top three causes of death. This was in contrast to the 1950s when infectious diseases such as tuberculosis and pneumonia were amongst the major causes of death. Nonetheless, the report also called for continued vigilance against the ever-present threat of outbreaks of novel infectious diseases.

Planning for the ageing population

Indeed, this decade saw a shift in communication with the population. The call to have more babies – a message which proved difficult to sell – morphed to planning for the future when an ageing population would place different and more intense demands on the public healthcare system.

Much work was done to develop strategies to cope with these issues. Within MOH, the Division of Elderly and Continuing Care was set up to be responsible for the healthcare of the elderly. The Inter-Ministerial Committee on Health Care for the Elderly (IMCHCE), formed in August 1997, reviewed the issue and identified measures needed over the next five to 10 years. The focus was on long-term care and affordability of healthcare.

The IMCHCE made 24 recommendations in 1999. Among them were better training for medical undergraduates in clinical geriatrics; better training for healthcare staff, home-carers and volunteers; strengthening co-ordination of care between agencies, ministries and providers; and the development of guidelines and standards of care.

It recommended the development of step-down care facilities and severe disability insurance. It also dealt with how to achieve the Government's vision of "Successful Ageing for Singapore" on the family, community and national fronts. This looked at social integration of the elderly, healthcare, financial security, employment and employability, housing and land policies as well as cohesion and conflict in an ageing society.

In January 2000, the Medical and Elderly Care Endowment Schemes Act was enacted to set up the Eldercare Fund, following recommendations of the IMCHCE to enhance the 3Ms to support the healthcare needs of the elderly. In July that year, MOH also initiated the Framework for Integrated Health Services for the Elderly to streamline and improve the access to healthcare for the elderly, as well as boost its quality. ElderShield, a severe disability insurance for long-term care, was implemented in September 2002.

The next committee was the Inter-Ministerial Committee on the Ageing Population. Prime Minister Goh Chok Tong announced at its launch in October 1998 that it would "set national directions and strategies to meet the challenges of the ageing population". The committee, chaired by then Minister for Communications Mah Bow Tan, built on the report of the Committee on the Problems of the Aged or the Howe Report, and covered key trends and challenges in Singapore's ageing population.

The third group was the Committee on Ageing Issues, set up in December 2004, tasked to build on the work done by previous committees. It looked into enhancing financial security of the elderly and improving employability of older workers as well as promoting active ageing and ensuring quality healthcare and eldercare services.

It was co-chaired by Senior Minister of State for Health Dr Balaji Sadasivan and Dr Mohamad Maliki Osman. Its report placed a new and urgent emphasis on maintaining a high quality of life for a new cohort of seniors – the baby boomers who would reach 65 years of age by 2010.

This cohort would be healthier and live longer due to rapid advances in medical science. They were also more educated and economically well-off than their counterparts of the 1970s and 1980s. They were also likely to have highly varied needs and aspirations to be catered to, within the window of only a few years.

Public education for a healthy nation

With longer life, the challenge would be to ensure it would be a healthy life – to reduce years of life spent in ill health or with disabilities. This added impetus to ensuring health promotion and disease prevention remained one of the cornerstones in the building of a healthy nation. MOH thus set up HPB in 2001, combining the functions of several divisions which had distinguished themselves in Singapore's healthcare journey – the National Health Education Department, Department of Nutrition, School Health Service, School Dental Service and the Health Promotion Division (Administration).

HPB would act as the main driver for national health promotion and disease prevention programmes. Its goal was to increase the quality and years of healthy life while preventing illness, disability and premature death.

HPB's programmes spanned many areas of life and activity. It launched the National Myopia Prevention Programme in August 2001, incorporating public education and vision screening for children to prevent and reduce myopia progression as well as delay the onset of the problem in children.

It joined IMH in launching the Mind Your Mind Programme in 2001, a 10-year effort to promote mental wellness. The desire was to raise awareness of the importance of early detection of major mental illnesses such as depression, anxiety disorders and schizophrenia as well as provide treatment for them. It taught the family, friends and caregivers of those afflicted with mental disorders to detect the early signs of depression in their loved ones and directed them to places where they could find help and the requisite treatment.

The National Healthy Lifestyle Campaign, which was launched in 1992, was translated into a wide ranging series of events to promote healthy activities among Singaporeans.

Businesses and employers were encouraged to motivate their staff through the Singapore H.E.A.L.T.H. (Helping Employees Achieve Lifetime Health) Award introduced in 1998. The A.C.T.I.V.E. (All Companies/Communities Together In Various Exercises) Day programme introduced in 1999 saw a day set aside for staff to exercise and learn the finer points of healthy living. The programme brought together private companies, unions and government departments to promote health awareness at the workplace.

The Ask For Healthier Food campaign aimed to get Singaporeans to ask for less oil, less salt and more vegetables when ordering food from hawker centres or food courts. In 1999, about 5,800 hawker stalls and 86 restaurants took part in this campaign.

The Eat Healthy campaign encouraged Singaporeans to choose foods which are within the expiry or sell-by date, and to check the nutrition information for low-fat and high-fibre foods. People were encouraged to learn the food pyramid and choose more wholesome products such as grains, vegetables and fruits while controlling their meat intake and minimising sweets, butter or other fat-laden products.

HPB also stepped up efforts to promote a balanced diet, setting standards for nutrition and food labelling.

Smoke-free Singaporeans

The campaign against smoking did not let up. Among the strategies were showing graphic post-mortem images of smoker's arteries, lungs and brains and introducing smoking cessation counselling programmes in 1999. Street

5,800

Hawker stalls and 86 restaurants took part in the Ask For Healthier Food campaign aimed at getting Singaporeans to ask for less oil, less salt and more vegetables when ordering food from hawker centres or food courts

Noor Melati Ahmad, Nurse Clinician, National University Hospital, SARS survivor

SARS made me a better nurse

WHEN I started work as a nurse in 2001, after graduating from Nanyang Polytechnic, I never thought I would end up on the hospital bed as a patient. Two years later, it happened.

I got the Severe Acute Respiratory Syndrome (SARS) infection from a patient who had come to NUH for treatment. At 22 years of age, all my concerns then were about my family and my boyfriend. I was scared I may not see them again!

I had all the symptoms. The high fever, chills, body aches and shortness of breath which went on for weeks. It was an emotional rollercoaster. I felt isolated, lonely and afraid. I was hospitalised in Tan Tock Seng for three weeks and at the Communicable Diseases Centre for a week. Even though I could see people coming to work and going home from the window of my room, it still made me feel like I was in a prison.

For a person who enjoys being in contact with colleagues, patients, family and friends, being confined in a room for two weeks was hard. Even the nurses, wearing full protective gear, would spend very little time in the room. They would only come in to give me my medicine and food.

I was allowed to have my phone and talked to my loved ones very often during this difficult period. My mother would call me every day and each time we talked, she would cry. Even my father, with whom I had a very strained relationship at the time, became emotional. I felt I had to put aside our differences and told him: "I am sick and I do not know if I will come out of this. I just wanted to say I love you." And he replied in Malay: "Ayah pun sayang Noor (father loves you too, Noor)." That is probably the only time he has ever said that to me.

After I was given the all-clear from SARS, my grandmother asked my mother to stop me from continuing with nursing. She felt I had escaped one infectious disease but may not be so lucky the next time. My mum stood up for me. She told my grandmother that my SARS episode was a sign that I could overcome any ordeal.

It helped that nurses were in the limelight at that time, so my mum motivated me to continue to help others. The SARS ordeal strengthened my relationship with my boyfriend too. We got engaged in 2004 and married a year later, after I finished my advanced diploma in nursing focusing on oncology. Now we have two daughters and a son.

SARS taught me that life is short, that we must appreciate what we have. As a nurse, you see caregivers and patients at their most vulnerable. I see death almost every day and I have patients who are so young, university or polytechnic age, or young mothers diagnosed with breast cancer or leukaemia.

I remember what I felt like as a SARS patient and try to spend as much time as I can with them, talking to them about how they feel. They ask me: "Am I going to die?". It is hard for them to hear that they have cancer and, in some cases, they might not recover from it. But when they accept it, they appreciate the time they have to spend with their families.

▼ With a little help from my friends.... Noor Melati Ahmad (centre) with her NUH colleagues who gave her support during her SARS ordeal.

performances were added to the campaign in 2002.

The campaign also tugged at the emotions of smokers. The 2003 campaign focused on adult smokers and their families, with the slogan "When you smoke, they suffer" encouraging smokers to give up the habit for the sake of their loved ones.

Laws were toughened too. Amendments to the Smoking (Control of Advertisements and Sale of Tobacco) Act required offenders under the age of 18 to attend face-to-face smoking cessation counselling. Licensing for all importers and wholesalers was required in 2003. Graphic health-warning labels on cigarette packets, the first of their kind in Asia, were also part of the Act. HSA was enlisted to enforce the laws that prohibit tobacco advertisements, smoking by youths under 18 as well as the sale of tobacco products to youths in this age group.

To curb the increasing trend of smoking among young women (18 to 29 years), HPB launched Fresh Air For Women, in August 2004, a programme that continues today.

The good news was that some 10 years after the National Smoking Control Programme was launched in 1984, the percentage of smokers in the population dropped from 20 in 1984 to 15 in 1998. In the same period, male smokers aged 18 to 64 dropped from 37 percent to 27 percent. Unfortunately, among females, the rate remained at three percent.

However, certain groups of smokers were more resistant to change. While older smokers could be persuaded to quit – the rate among those aged 45 to 64 dropped from 27.7 percent to 14.8 percent between 1984 and 1998 – more youngsters were picking up the habit. One in five children had tried smoking by age 10; by age 17, young smokers had established their habit.

Smoking among young females posed "a great concern", said Dr Mohamad Maliki Osman, Parliamentary Secretary for Health and Community Development, Youth and Sports at the First Lung Cancer Awareness Month in November 2004. Their numbers among those in the 18 to 25 age group jumped three-fold from 2.9 percent to 8.4 percent between 1992 and 2001. Smoking among Malay males (43.3 percent) and unskilled male workers

▼ Smile, you're on nicotine camera… in 2003, all cigarette packets sold in Singapore started carrying graphic health warning labels.

(50.8 percent) was still high.

Between 1980 and 2000, the incidence of lung cancer in males had dropped by 28 percent and in females by 25 percent. Still, seven people died tobacco-related deaths and three died from lung cancer daily.

Facing down diseases

The defining disease of this decade was SARS, or Severe Acute Respiratory Syndrome. However, while the SARS outbreak gripped global attention and caused fundamental changes in public health strategies, other outbreaks of more common diseases kept the public healthcare system on its toes too. The arrival of the Nipah Virus, like HIV/AIDS before it, proved puzzling but also strengthened Singapore's growing collaboration with its regional and global counterparts.

In March 1999, a number of abattoir workers working in the pig industry came down with fever and predominantly neurological symptoms. At the same time, a similar outbreak had occurred in the two Malaysian states of Negeri Sembilan and Perak. As 80 percent of pigs that were imported into Singapore came from Malaysia, healthcare personnel concluded that the two outbreaks were linked.

Doctors thought it was Japanese encephalitis (JE) which was endemic in this part of the world. Measures to deal with it included the banning of pig imports and fogging of the abattoirs to eradicate mosquitoes that carried the disease. Singapore had one fatality while Malaysia reported 257 cases of febrile encephalitis and 100 deaths.

However, it was soon found that the victims had not died from JE but a new virus. It was identified as a paramyxovirus and given the name Nipah Virus. Singapore banned all pig imports from Malaysia and closed all its abattoirs from 19 March 1999. In Malaysia, the measures were more drastic. Some 890,000 pigs were culled, among other measures, to control the spread of the disease.

The outbreak also caught the attention of international bodies such as the US Centre for Disease Control and Prevention in Atlanta, Georgia. Their experts and others from Australia worked with the authorities in Singapore and Malaysia to study the disease and its spread. No new cases have been detected in Singapore since 19 March 1999.

Singapore was not so lucky with the Hand, Foot and Mouth Disease (HFMD), a common and often mild disease with frequent outbreaks among young children although it can affect adults too. The HFMD outbreak in 2000 caused widespread alarm. At its peak in October 2000, 2,511 HFMD cases were reported with the majority of them occurring in the first two weeks of the month. Four children who developed complications of viral pneumonitis died from the disease.

HFMD was made a legally notifiable disease. All 557 childcare centres and 440 kindergartens in Singapore were closed for two weeks to break the chain of transmission.

The fight against HFMD required the cooperation of several ministries. MOH made it mandatory for all hospitals and doctors to inform it about all cases of HFMD infection. The Ministry of the Environment carried out epidemiological investigations of reported cases while it teamed up with the Ministry of Community Development and Sports to inspect the health and hygiene standards of childcare centres, nurseries and kindergartens. Enforcement action was taken against those that did not comply with established guidelines.

In September 2005, Singapore was tested again when it suffered its worst dengue outbreak. A record number of patients, topping 600 a week, flooded the hospitals. Complaints were rife over long waiting times at the emergency rooms and longer waits for scans and treatments. The crush was so great that the accident & emergency department at TTSH had to turn away non-critical ambulance cases for an average of more than two hours a day.

The National Environment Agency launched intensive exercises to eradicate the vector population and the number of cases finally slowed down by November that year. Dengue continues to be a menace and campaigns to educate the public to prevent its spread are ongoing.

However, all these outbreaks paled against the impact that SARS had on Singapore. It arrived in Singapore quietly, onboard a flight from Hong Kong in early 2003, but soon made headlines and tested the country's resilience in an unprecedented

▼ Safety check… the Hand, Foot and Mouth Disease outbreak in 2000 saw all schools and childcare centres conducting daily checks. At its peak in October 2000, 2,511 HFMD cases were reported.

Boy, you can take on SARS

On 27 March 2003, all primary and secondary schools, junior colleges and centralised institutions in Singapore were closed to prevent the spread of SARS. When they reopened the following month, the focus was on prevention of infection. As part of education efforts which included crossword puzzles and quizzes, this placemat was given to all the childcare centres on the island. It used a popular cartoon character Boy-Boy to explain how a child could stay free of the deadly virus.

Professor Leo Yee-Sin, Director of the Institute of Infectious Diseases and Epidemiology, Tan Tock Seng Hospital, and a recipient of the Public Service Star for her contribution in the fight against SARS in 2003

On guard against infectious diseases

UNTIL SARS put the field in the "limelight" in 2003, infectious diseases was not a popular medical speciality. When I joined the medical service as an infectious disease trainee in 1989, I was part of the pioneer batch of trainees. We were the only batch trained in infectious disease for 10 years. That's how long it took us to recruit new people into the field.

Infectious disease is the lowest-earning speciality in internal medicine but I had a passion for it. I was excited by the brand new bugs that affect individuals and always wanted to know more. Even within the infectious disease speciality, when I had to choose between travel medicine and vaccination and HIV in 1994. Travel medicine is probably one of the most financially rewarding sub-specialities in infectious diseases and HIV was the direct opposite. I thought long and hard and I eventually picked HIV.

When I came back to Singapore in 1993 after my training at Cedars-Sinai Medical Centre at UCLA in California, HIV patients were outcasts here. They had no community support and I saw how they struggled. I felt I could not abandon them even though it was challenging to set up the HIV programme. It was not an easy road especially when people didn't understand HIV and there was a lot of negativity towards it.

While I was fascinated by the disease, I was more touched by the HIV-positive people I treated. In the initial years, I saw mainly young gay men with the illness. Subsequently, in the early 1990s, I saw more heterosexuals with a lot of family issues and then old people coming down with HIV.

Setting up the HIV programme in 1995 showed me the close links between infectious disease and public health. That's when I began to understand the importance of linking social, psychological and public health, apart from giving just clinical care. My involvement in the HIV programme prompted me to expand my horizons and my scope towards community and public health.

I only got to deal with outbreak management in 1999 when we had the Nipah Virus outbreak. Fortunately it was a small scale outbreak with direct transmission from animal to human, no human-to-human transmission.

That said, it was challenging as we had to react to the situation quickly working with teams from other ministries. The Ministry of Health team linked up with a team from the Ministry of National Development, which the Agri-Food & Veterinary Authority of Singapore (AVA) was under, and also the Ministry of Environment's quarantine and epidemiology unit headed by Professor Goh Kee Tai at the time. It was a real-life experience and an eye-opener in outbreak management.

We made some mistakes, like having both healthy and sick abattoir workers in the waiting room of our small clinic while the doctors would come in to screen them. Those were the critical mistakes we knew never to repeat. In response to SARS, we set up a triage area and came up with a questionnaire about symptoms and contact travel and streamlined the path so the high-risk patients went straight into isolation. The second lesson we learnt from Nipah was healthcare workers' readiness; my staff went in with just an apron to treat infected workers.

We also learnt that you can't treat an infectious disease in isolation. During the Nipah Virus outbreak, patients had lung infection and brain infection so we had to bring in colleagues who specialised in these areas.

By the time SARS struck, we had some basic understanding and experience. SARS put a lot of things into perspective for our healthcare system. We now appreciate the importance of being ready and the need to be flexible. Every outbreak, every pathogen comes with its own characteristics so you cannot have a one-size-fits-all solution. The plans have to be flexible; be willing to change course along the way once you get more information about that particular pathogen and how people react to it. From my point of view, SARS made people realise the importance of public health and the field of infectious diseases. SARS indeed changed the landscape of infectious diseases and more doctors joined the infectious disease speciality.

Today, we still look at infectious disease as a hospital issue. Infection control has to have an integrated approach as these diseases respect no boundaries, geographical and medical. We want to develop our strategies vertically and horizontally. We want to be able to connect with our step-down care facilities, talk to community care providers as well as the infectious diseases centres in all the hospitals and on a regional and global level. There is a lot more work to be done.

► SARS fighter... Prof Leo Yee-Sin at the Communicable Disease Centre where SARS patients were warded in 2003.

way. First recognised in late February 2003 in Hanoi, Vietnam, SARS reached Singapore on 1 March that year when the country's first patient was admitted to TTSH for suspected pneumonia. By 15 March, Singapore had 16 cases. For medical workers, policy-makers and the man in the street alike, it proved to be a fearsome experience.

MOH swung into action once again. A task force was formed, chaired by Professor Tan Chorh Chuan who was then Director of Medical Services, and it asked hospitals to screen emergency department patients for fever and check if they had travelled to SARS-affected areas. It also issued guidelines on controlling the infection. By 22 March, TTSH was designated the SARS hospital and a SARS hotline had been set up. The Infectious Diseases Act was invoked two days later and about 740 people were home-quarantined.

SARS claimed its first victim in Singapore on 25 March. He was the father of the first patient. On 27 March, the Ministry of Education shut all schools. As the situation became grimmer by the day, medical staff were also discovering that there was no effective treatment beyond good intensive and supportive care.

Meanwhile, the medical community, especially the staff in TTSH, overcame the fear of infection and kept caring for their SARS patients. Showing courage and teamwork, some volunteered to stand in for colleagues who were quarantined or took extra shifts to make up manpower needs. A number would come down with the disease – healthcare workers made up nearly 41 percent of cases, with family members, friends, social contacts and visitors making up 37 percent and inpatients just 13 percent.

Temperature checks were introduced at all ports of entry into Singapore. Every person arriving had to walk past an infra-red thermal imaging scanner. The scanner detected persons with a temperature higher than 38.0°C, as their faces showed up as a red image on the screen. As fever was a telltale sign of SARS, people with temperature higher than normal had to be examined and certified SARS-free before they were allowed entry.

A ministerial committee, headed by then Prime Minister Goh Chok Tong, was formed when the death toll hit six on 6 April. Singapore's epidemiology and infectious diseases experts

25 March, 2003

SARS claimed its first victim in Singapore on this day

1995 - 2005

Hot topic… anyone who lived in Singapore in 2003 will remember the thermal scanners used to screen people for SARS.

worked feverishly with their counterparts in Vietnam, Hong Kong, the CDC in Atlanta and the World Health Organisation (WHO) to better understand the new disease and to contain it.

The immediate impact of SARS was fear. Public life almost came to a standstill as people avoided crowded places and abstained from normal activities such as shopping, eating out and swimming. Many people cancelled their travel plans. The situation escalated in early April when a vegetable seller at the Pasir Panjang wholesale market was epidemiologically linked to a cluster of 12 cases, including eight in a family connected to the centre, sparking fear of community spread of the disease.

One long-lasting positive effect was that people got a nationwide crash course on the importance of maintaining proper hygiene habits. They started paying more attention to washing their hands, displaying considerate behaviour such as wearing masks when having a cold or the flu and proper disposal of their used tissue paper.

SARS had a huge economic impact too. Businesses suffered losses and the stock markets were nearly at a standstill. Visitor arrivals, hotel occupancy rates, business at retail shops and restaurants plunged and taxi drivers drove around empty. During the April-June quarter of 2003, when the full impact was felt, the economy contracted sharply by 4.2 percent year-on-year.

The Government recognised the severity of the situation and announced a $230 million relief package on 17 April to tide businesses over. Measures included property tax rebates for hotels and commercial properties, fee rebates for airlines and cruise operators, and diesel tax rebates for taxis.

There were false alarms too. Just when Singapore looked to be declared free of SARS, a flu outbreak in IMH on 18 May caused widespread alarm of a fresh outbreak. Notwithstanding that, Singapore's last SARS patient was detected on the same day. The country was eventually declared SARS-free by the WHO on 30 May.

The Singapore's OK campaign was launched in 2003 by the National Environment Agency. It aimed to encourage Singaporeans and businesses to maintain hygiene in public places and practise good toilet habits so as to prevent the spread of infectious diseases. Some 6,200 people volunteered to help. The result was that almost 80 percent of all public toilets were certified clean and given the Singapore's OK label. The campaign would be relaunched when Singapore faced the risk of Influenza A (H1N1) in 2009.

Singapore earned high praise from WHO experts for its management of SARS, in particular for its open, candid and empathetic communication with its residents throughout the crisis. This "built trust with its own citizens and with other nations", said Dr Jody Lanard, when she delivered the keynote presentation at the WHO conference on Outbreak Communications on 21 September 2004.

SARS was not without its light moments. In his post-SARS National Day Rally speech in August 2003, titled "From the Valley to the Highlands", then Prime Minister Goh Chok Tong spoke to a relieved nation. He said when schools were closed because of SARS, "our students rejoiced that 'S, A, R, S' stood for Schools Are Really Shut. When schools re-opened on 16 April, they moaned that Sixteenth April Return School".

He added: "To SIA staff, SARS was a depressing acronym: Singapore Airlines Retrenching Soon. But to the feisty Malay nurse who recovered from SARS, the acronym had a happier meaning. She proclaimed that for her, SARS stands for Single And Really Sexy."

Then PM Goh candidly said SARS, to him, stood for Singaporeans Are Really Scared.

"Yes, we were really scared. Scared for our lives and our loved ones. Scared of taking a taxi, scared of going to the hospital. Scared that tourists and customers would not return, and we might lose our jobs. For the first time in our history, all Singaporeans felt the same fear at the same time. But far from being frozen by the fear, the entire nation sprang into action," he said.

And the weapon of choice? The thermometer. "We armed every household, every student, with a thermometer."

In his message of reassurance and hope, he drew from a Chinese verse "山穷水尽疑无路,柳暗花明又一村" which translates to "Where the hills and streams end and there seems to be no road ahead, amidst shady willows and blooming flowers, another village appears." He said: "In other words, when all seems lost, there is hope."

When Singapore commemorated the 10th anniversary of SARS on 31 May 2013, Prime Minister Lee Hsien Loong recalled the fear and anxiety and also the courage and strength of the nation. He paid tribute too to the many who played a part in overcoming SARS.

He said in his speech: "Fear was as great a threat to us as the disease itself. But amidst the dark clouds of anxiety, we found strength and confidence in one another. The strength to carry on with our normal lives instead of cowering in fright. The strength to fight and defeat this disease instead of surrendering ourselves to it. The confidence that comes from overcoming challenges together, as we had done before.

"Mr Goh Chok Tong was then Prime Minister. He wrote a letter to all Singaporeans, to rally the population and explain what we needed to do, individually and together. The Ministry of Health, led by Lim Hng Kiang and later Khaw Boon Wan, and many other government agencies put aside their usual duties to focus on this national crisis. Even the SAF was mobilised, to take charge of contact tracing.

"MediaCorp, SPH Mediaworks and StarHub came together, and ran a special TV channel to educate the public on SARS. Close contacts of SARS patients were served Home Quarantine Orders, and kept under telephone and video surveillance. School pupils learnt to take their own temperatures daily, and so did hawkers in hawker centres. Engineers worked round the clock to design and build temperature scanners, to screen travellers entering and leaving Singapore. We coordinated our actions in Singapore, with the international community, especially with the World Health Organisation.

"Singaporeans rose to the occasion. Neighbours sent food and groceries to those under quarantine. Teachers prepared worksheets and home lessons for students when schools closed. Taxi drivers

6,200

People volunteered to help with the Singapore's OK campaign launched in 2003 after the SARS outbreak. The aim was to maintain hygiene in public places and practise good toilet habits so as to prevent the spread of infectious diseases

► Courage on the ground… SARS was deadly but healthcare workers never shirked the responsibility of extending the best possible care to the people of Singapore.

sent passengers and healthcare workers to and from Tan Tock Seng Hospital after it had been designated as the SARS hospital.

"In those dark times, none was stronger or braver than our healthcare workers. They cared for their patients, despite the risk to themselves and to their families. They soldiered on at their patients' bedsides, guided by their professionalism and sense of duty. Quite a few were non-Singaporeans, who stayed on to take care of us in our time of need. We are forever grateful to these brave and selfless men and women. Sadly, five healthcare workers fell ill and paid the ultimate sacrifice: Ong Hok Su, Alexandre Chao, Hamidah Ismail, Jonnel Pinera and Kiew Miyaw Tan. We remember and honour them always."

A more telling legacy of the lessons learnt from SARS was the structure that MOH put in place to meet future outbreaks of major diseases. An Operations Group was formed. It is responsible for the prevention and control of outbreaks of major infectious diseases, including bioterrorism events. It also plans for crisis management and the coordination of health services and operations during peacetime while setting up guidelines for command and control of all medical resources during a crisis.

A three-pronged strategy comprising the establishment of the disease outbreak and response system, the strengthening of the public health system, and the development of national biosafety standards was formulated.

The surveillance and analysis capacity was enhanced and a command and communication network put in place. Contingency plans for all healthcare institutions and agencies were developed and coordinated while preparedness exercises and audits were periodically conducted. Emergency procurement and stockpiling of critical medical supplies such as personal protection equipment for up to six months were established. Professional manpower needs were reviewed and additional isolation facilities set up in all hospitals. A national centre for infectious diseases and emergency preparedness was planned for.

A fund for courage

SARS' final tally in Singapore was 238 probable cases and 33 deaths, including five healthcare workers, but it also allowed Singaporeans to show their generosity of spirit. The Courage Fund was a good example. Launched on 11 April 2003 to raise funds for victims' families, it incorporated the informal SARS Relief Fund which had been set up earlier that month by the Singapore Medical Association and the Singapore Nurses Association. By the time collection ended on 22 July, the people of Singapore had donated $28.5 million.

The Courage Fund committee put the money to good use. Families of the victims were helped. The Courage Awards were instituted and more than 5,500 awarded to healthcare workers to recognise their extraordinary courage and selfless dedication in the fight against SARS. Sums were also set aside for needy healthcare workers, for setting up a professorship in epidemiology and infectious diseases management and control and bursary awards for the children of nurses and other healthcare workers. A sum of $8 million was set aside for use in future outbreaks. Interest from that amount would support an annual model health worker award, known as the Courage Fund Healthcare Humanity Awards, launched in 2004.

More than 10 years on, SARS continues to be a defining moment in Singapore's history. It was a time of fear, of sorrow and sadness. But it was also a time when Singaporeans rallied together. It showed us that we will stand together in good times and in a crisis.

33

Deaths in Singapore due to the SARS outbreak in 2003

1995 - 2005

Registered Allied Health Professionals are expected to always:

Communicate effectively with your patient, caregivers and other professionals;

Ensure that any advertising you do or support is truthful, accurate and does not induce unnecessary demands for your services.

Extract from the Code of Professional Conduct for allied health professionals in Singapore. The Code of Professional Conduct has existed ever since the first registration for allied health professionals in April 2013. It is part of the Allied Health Professions Council's mandate to ensure the safety of the public and lists the attitude and behaviour required of the professionals overseen by the council.

Height of innovation... Khoo Teck Puat Hospital, the first new public hospital of this decade, won awards for its extensive use of greenery, well-designed facilities and easy wayfinding.

6 Towards a more inclusive society

Accessible, affordable and quality care

2005 - 2015

With all the hard work and investments in healthcare over the years, Singapore can be proud to have achieved universal healthcare coverage (UHC). The World Health Organisation defines UHC as "ensuring that all people can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not expose the user to financial hardship".

In short, UHC has three elements. One, access to service for all, not just for those who can pay. Two, quality of health services that is good enough to improve the health of those receiving services. Three, ensuring that the services are affordable.

Singapore's public healthcare system has steered a careful path over the years to achieve all three elements. However, with the rapidly ageing population, policy-makers have had to re-shape our fundamentals. Innovations like Medisave, MediShield and Medifund were progressively introduced in 1984, 1990 and 1993 respectively to meet the changing needs of a modern, developed and well-educated society.

The unrelenting battle against non-communicable lifestyle diseases continues unabated as patterns of disease change. The disease burden from cancer, diabetes and heart disease has increased as a result of changing lifestyles.

This shift in disease patterns necessitated innovative ways to help Singaporeans manage their health. It meant greater reliance on primary care even as fast-paced development of the integrated long-term care sector ensured that those who needed care could access it at the appropriate level. On the national level, it required even more efficient use of resources for which there are competing needs. For patients and their families, such strategies had to translate to more convenient and affordable care, and the right care for the right condition, be it at the general hospital, community hospital, nursing home or even at home.

The Ministry of Health (MOH), over these 10 years, undertook significant changes in the organisation of the public healthcare system, infrastructure development, delivery of services and healthcare financing. The decade also saw the Government forge stronger partnerships with the private healthcare and charity sectors, under the inclusive philosophy of "one healthcare system" for the nation. These partnerships retain the best features of private practice and the work of voluntary welfare organisations (VWOs) while MOH provides resources to boost their capabilities.

Singapore's health defences against new and imported diseases were also strengthened, taking into account lessons learnt from AIDS, SARS, H1N1 and Chikungunya, among others. Again, a whole-of-Government approach was adopted to better focus strategies and resources to fight these and other unforeseen diseases and illnesses.

The need for doctors, nurses and allied health professionals is an ever pressing one. The decade saw even more concerted effort and innovative strategies from MOH to boost recruitment, especially of nurses and allied health professionals. Mainstays like improving efficiency through technology were combined with more innovative measures like advanced training and new skills grades as well as improved prospects for recognition and career advancement. These were aimed at making nursing and allied health more appealing to school leavers, and mid-career professionals seeking a fulfilling change of careers.

Universal healthcare coverage

Singapore's healthcare system is founded on the same three elements listed by the WHO – a sufficient range of healthcare services, of appropriate quality and affordable to citizens.

The system, as it has evolved, has been "crucial to prevent demand from spiralling out of control, to keep the healthcare system efficient, and to hold expenditures down, while providing good outcomes… low infant mortality and high life expectancy… good treatment standards and good outcomes for specific diseases – whether it is stroke, diabetes, cancer and so on", said Prime Minister Lee Hsien Loong at the Ministerial Meeting on Universal Health Coverage in February 2015. His audience of 300 people hailed from 16 countries, and included health ministers from Bangladesh, Brunei, Finland, Indonesia, Myanmar, Thailand and Vietnam.

At the same meeting, Dr Margaret Chan, WHO's Director-General, said WHO placed Singapore at the top for key health indicators, especially maternal and infant mortality which are two of the most sensitive indicators of a well-functioning system.

She commended Singapore for its foresight and visionary planning, leading to the country achieving "first-rate healthcare, with outstanding health outcomes, at a cost lower than in any other high-income country in the world. This achievement was firmly anchored in a value system that places a premium on fairness and inclusiveness as a route to social cohesion, stability and harmony".

Dr Chan praised Singapore's public healthcare system for balancing the "advantages of competitiveness and other market forces with the need for state intervention to steer these forces in the right direction". She added: "It balances freedom to choose providers, services and facilities with an obligatory health savings account, the Medisave plan, with its emphasis on individual responsibility. There is no free lunch. The plan works to protect against the over-consumption of care. To help inform responsible decision, MOH publishes hospital bills for common illnesses on its website."

PM Lee described enabling citizens to live full and healthy lives as one of the most important responsibilities of every government. Singapore's ability to provide universal healthcare coverage had come about through its belief system and measures on the ground. Good health, he said, was "fundamental to the happiness, fulfillment and dignity of every human being… and is a basis for the nation's prosperity and success". However, he pointed out that achieving it was a very difficult goal as the usual economic models did not work well; there were moral hazards to be avoided and a variety of instruments were needed to achieve the desired outcome.

Singapore's first move was to tackle public health issues – public sanitation, for example replacing the night soil system with the sewage system, compulsory vaccination and innoculation, the public housing programme and heavy investment in education. This required a multi-agency approach to tackle these pressing social issues.

▲ WHO knows best… the World Health Organisation ranked Singapore's key health indicators, especially maternal and infant mortality, as among the best in the world.

"Good health is fundamental to the happiness, fulfillment and dignity of every human being… and is a basis for the nation's prosperity and success."

Prime Minister Lee Hsien Loong (right, with Health Minister Gan Kim Yong and WHO's Director-General Margaret Chan at the Ministerial Meeting on Universal Health Coverage in February 2015)

▲ Long-term care… this was one of the issues Mr Khaw Boon Wan (seated next to a patient at the opening of the Ren Ci Community Hospital in 2010) worked on during his stint as Minister for Health.

Then, restructuring transformed the public hospitals into "autonomous, non-profit operating and accounting entities", resulting in a mature system where the majority of hospital beds are provided by the restructured hospitals, complemented by private hospitals.

Finally, PM Lee added, Singapore sought to achieve "the right balance in healthcare financing between individuals and the Government, between savings and insurance and government subsidies… a system which is dynamic and has evolved over time". Subsidies are generous and tilted towards lower-income patients. The 3Ms, as part of healthcare financing, have been "crucial to prevent demand from spiralling out of control".

He said that, over the last few years, the Government had made four important shifts in healthcare policy to meet the evolving challenge of providing good healthcare. The first was more comprehensive support for outpatient treatment, including subsidy schemes for lower- to middle-income Singaporeans at private clinics. The second was replacing MediShield with MediShield Life. The third dealt with right-siting services so that patients could receive better, more affordable care in their communities, including better access to affordable care by general practitioners (GPs), building more community hospitals, restructuring subsidies to encourage patients to seek the most suitable treatment at the right place. The fourth encouraged Singaporeans to take better care of their health, with public education on active lifestyles within communities.

"The traditional healthcare system is too (high-tech) acute-care focused. If the large number of chronically-ill were all to be treated in sophisticated (high-cost) acute hospitals, the system will jam up and healthcare will not be affordable."

Health Minister Khaw Boon Wan

Emphasising the continuing challenges, PM Lee said that healthcare would always be an emotive and political issue and Singapore was determined to keep the system sustainable by not succumbing to the temptation to make short-term political gains. The trade-off was that "every dollar which is spent on healthcare is one dollar taken from taxpayers and one dollar less to be spent somewhere else, whether on education, housing, defence or personal needs of our people. It requires an honest conversation amongst ourselves, and hard choices to be made".

PM Lee's summary of the four shifts encapsulated many significant plans and changes made to the healthcare system since the start of this fifth decade under Mr Khaw Boon Wan, Health Minister from 2004 to 2011, and his successor, Mr Gan Kim Yong.

Transforming for integrated care: *The Regional Health System*

One of the big decisions was to reorganise the two-cluster system into six Regional Health Systems (RHS), a reflection of the continuous refinement to the public healthcare system to ensure affordability, accessibility and to meet the changing needs of the ageing population.

The aim of the reorganisation was to bring together the public, private and people sectors to deliver patient-centric and seamless care for the community within the specific geographic region served by each RHS. Each RHS would be anchored by a major hospital working in close partnership with other healthcare providers such as community hospitals, nursing homes, day care centres, polyclinics, GPs and home-care providers. The aim was to integrate care pathways and facilitate seamless movement across care settings to meet each patient's needs.

During his time as Health Minister, Mr Khaw spelt out clearly MOH's rationale for the RHS in one of his regular blog posts on 14 December, 2009.

"We have decided that we can achieve a better outcome if we reduce the size of each catchment and organise the healthcare delivery systems at the regional level… Within each region, I expect the acute hospital to work closely with key healthcare partners (community hospitals, nursing homes, GPs, home healthcare teams, hospices etc) in the region, with all taking a patient-centric approach in their daily work (as opposed to the traditional institution-centric approach)," he wrote.

However, the clusters would not have monopoly power and patients could choose to be treated in other hospitals or community hospitals in other regions, he said. Complicated medical conditions requiring sub-specialist care would probably still have to go to Singapore General Hospital (SGH) or National University Hospital (NUH) for their expertise. Most of the needs could be catered for within the region, providing convenience and cost savings for patients.

In his interview for this book, Mr Khaw explained that his return to MOH after a decade away enabled him to revisit the healthcare delivery and financing system. He focused on three areas in particular: Strengthening the 3Ms, reorganising the hospital clusters, and reworking long-term care and disease management.

He said: "Population ageing has further advanced and the demographic challenges are more obvious. With people living longer, chronic diseases will be the main cause of morbidity and mortality. The traditional healthcare system is too (high-tech) acute-care focused. If the large number of chronically-ill were all to be treated in sophisticated (high-cost) acute hospitals, the system will jam up and healthcare will not be affordable.

"We crystallised the approach as creating 'hospitals without walls', so that hospitals define their responsibilities beyond their four walls, to the outside community. Their mission must be to help Singaporeans stay healthy and away from the hospitals. After an acute episode, the hospital must help the patient to recover, recuperate in the (lower cost) long-term care (LTC) sector and work actively with the professional partners in the LTC sector to keep the patients well.

"Such a holistic and preventive approach to healthcare is the right way to go, ensuring the best quality of life and quality of care for our patients. This requires an active and productive partnership between the acute care sector and the LTC sector. We are all partners in one mission… the welfare and health of our patients."

The transformation required not just vision and resources. It also required policy adjustments to address the shortcomings of the two clusters as they evolved, political will and support to see through the changes as well as empathetic leadership from the minister and his team.

Ms Yong Ying-I, who served as Permanent Secretary for Health from 2005 to 2012 working alongside Mr Khaw, was both candid and realistic in her assessment of the changes to the healthcare system that were made necessary by the changing times and needs. When interviewed for this book, she highlighted the key point of doing what made sense in the light of the very complex system that is healthcare. It was necessary to view past developments from a larger perspective and take a long-term view.

Healthcare, she said, is a "continuous journey" and single events by themselves do not make sense until they are put into perspective as part of a bigger picture.

"It is not a straight line but you can then understand why people chose to do what they did at a certain time," she said. For example, in the early days, "we didn't really need that much step-down care because we had larger families. Step-down care was typically informal, provided at home. So a lot of our original intermediate and long-term care (ILTC) and community hospitals were provided by charities… really meant for the poor who couldn't look after themselves".

She pointed out that the two-cluster system made sense at a high policy level: "The theory of competition may have made sense philosophically but, when you actually applied it, we didn't have the institutional structure at that time to make competition really useful."

She added: "Vertical integration is where you realise the synergies between the components of the cluster. Vertical integration makes sense because if the patient goes to see a GP, he can go to a hospital if his GP refers him. But of course it meant enlarging the system, taking on board community hospitals, nursing homes, primary care institutions... and we had to work out new

▲ The times, they are a-changing… Ms Yong Ying-I (above, with a medical student and her daughter at a Duke-NUS Graduate Medical School event in 2010) was Permanent Secretary for Health from 2005 to 2012 and calls healthcare a "continuous journey" where change is inevitable due to changing needs over time.

Pauline Tan, former Chief Nursing Officer and Chief Executive Officer, Yishun Community Hospital

The nurse who became CEO

IT WAS thanks to a close neighbour, during my childhood days in Toa Payoh, that I became a nurse. She was a nurse and I would chat with her every evening and tell her about my day. She would then tell me about what she did during her day in the operating theatre.

Her tales captured my heart and, after my A-levels, I was automatically drawn to her profession.

When I joined nursing, I started as an enrolled nurse. As an enrolled nurse, you must do very well in your courses to get into the student nursing programme. You had to get a distinction (75 marks and above) or a merit (70 and above). If you got just a mere pass, you had to wait many years before going through an interview to get into the programme. Determined to do well, I studied very hard and was one of seven students who scored distinctions in my cohort of 300-plus.

I was very excited when I got my first clinical posting. Having heard so much from my neighbour about nursing, I was so excited to finally see a patient. Nursing was simpler in those days. Whichever hospital I went to – and I was posted to nearly all of them – it was one big family. Patients were happy with our care. We had time to interact with them and talk to them. There was enough time to build bonds and build relationships even with the demanding ones.

I still remember one patient, a lawyer who had lupus (a disease where a person's immune system attacks the body's own organs and tissues). She was very articulate and very demanding. Everybody avoided her but I spoke to her and helped her whenever possible. I felt she was covering up her sadness. Later, when I was living in the hostel at the School of Nursing, we corresponded by letters over the years but lost touch eventually. Years later I saw her obituary in the newspaper. I went to her wake to say goodbye because of the bond I had built with her.

For me, nursing is a beautiful job, walking that journey with the patient, whether it's a joyful moment or spending time with the patient during the final days. When I went into the wards and saw how nurses were treated by other professionals, I didn't like it. I was determined that, when I did take on a position of seniority, I would stand up for my nurses. Which is what I am today... just speak up lah! Of course, without being confrontational.

In 1989, I got the chance to further my studies overseas on a scholarship. When I returned after two years at LaTrobe University in Melbourne, I felt healthcare was still medically dominated and nurses weren't very much empowered. I thought... you invest so much in training a nurse, what's the point if the nurse can't make simple decisions? I felt the only way I could make any changes was if I got to a senior position.

That happened when I finally became director of nursing at the Institute of Mental Health. I empowered my nurses, creating a culture where they are free to make decisions or suggestions to improve patient care. As I did my rounds at the wards, I picked up information and when I saw situations where nurses could make a change for the better, I wrote to the chairman of the Medical Board. Just being in touch with my nurses made the difference.

Now that we have the Care To Go Beyond (CTGB) campaign to bring more Singaporeans into nursing (and allied health professions), the change in perception about the profession is not just for the public but also the nurses. For the longest time, there had been a false perception that nursing is a low-skilled job. The nurses, no matter how educated, would always have their own self-limitations. Now, thanks to CTGB, they feel empowered. And that's the message they must get: It is okay to be the best you can be.

By doing so, people will respect you. Don't marginalise yourself. See yourselves as proud professionals.

Now that I have taken on a senior management role at Yishun Community Hospital, it doesn't mean that nursing is no longer part of my life. It will always be embedded in my heart and I hope all our nurses will see my career as proof that they can do it too.

I hope I have made my nurse-neighbour proud.

◄Passionate Pauline... Showing the first buds of leadership, Yishun Community Hospital CEO Pauline Tan as a rookie nurse (second from far left).

partnerships. We didn't necessarily feel that we must own everything… but nevertheless they could be partners in the cluster."

In 2015, Singapore is served by six regional health clusters.

In the east, Changi General Hospital (CGH) was spun out of Singapore Health Services (SingHealth) to be part of the Eastern Health Alliance (EHA), together with St Andrew's Community Hospital (SACH), the Salvation Army Peacehaven Nursing Home and SingHealth polyclinics. EHA aims to provide seamless, integrated and appropriate care at every stage of a person's health journey.

As Assistant CEO of EHA and a consultant with MOH, Professor Fock Kwong Ming was intimately involved in the effort to translate the concept of right-siting into reality for doctors and patients. He remembers the early days of promoting the concept of integrated care well: "Hospitals are the engines that drive integrated care but to move patients to appropriate care, we had to get the primary and community sectors on board. It took several years before our conversations with them bore fruit."

The breakthrough came when he started talking about managing specific diseases, like diabetes. "Suddenly, they opened up and started sharing their experiences. We learnt from that. First, integration of care had to begin with a specific disease. The clinicians could see clearly the roles they each played in the integrated care pathway and the outcomes we were aiming for," said Prof Fock.

"There were many different partners, from different backgrounds and training. Once we could give them a common script and common outcome indicators, they were on board. The integrating didn't really need that much of a push. It was organic."

CGH's Health Management Unit, which had started in 2010, helped discharged diabetic patients manage their condition at home through tele-monitoring and tele-education, leveraging on a call-based patient relationship management system.

Collaborative efforts between EHA partner organisations also took shape after EHA's launch in 2011. Grace Corner, started in December

6

Regional health clusters in Singapore as of 2015.They are Alexandra Health, Eastern Health Alliance, Jurong Health, National Healthcare Group, National University Health System and SingHealth

▲ Stay home, stay healthy… while physiotherapists and occupational therapists in CGH work with patients in a dedicated hydrotherapy pool (above), KTPH's Ageing-in-Place programme sees physiotherapists visit patients at their homes with Community Nurses (above, right) to teach them simple strengthening exercises.

2011 in the Salvation Army Peacehaven Nursing Home provides rehabilitation services for "clients" (instead of "patients") with a difference. A collaboration between the nursing home and CGH, it is the first facility in Singapore to offer clients with long-term debilitating conditions, such as fractures and strokes, lower-intensity rehabilitation over six to 12 weeks to help them regain maximum mobility and return home to live as independently as possible. They are cared for by a team of nurses, therapists, healthcare assistants and social workers from Peacehaven and the geriatric medicine team from CGH.

This replaces the usual model for such patients which is for them to spend a longer time in hospital, get admitted to nursing homes or return to their own homes without sufficient rehabilitation.

A third novel programme launched in January 2014, Neighbours for Active Living, or Neighbours for short, combines healthcare with social expertise and resources to train volunteers to care for sick elderly in their own neighbourhoods. It was developed jointly with the South East Community Development Council.

Other RHSes too had their innovations. In the north, residents are served by the Alexandra Health System cluster, anchored by the 590-bed Khoo Teck Puat Hospital (KTPH). Its Ageing-in-Place programme, begun in 2011, identifies "frequent admitters", or patients with three or more hospital admissions within six months. These patients get home visits to review their unmet needs, including social, behavioural and environmental issues. Customised care plans are then developed to help them manage better. Frequent admitters are usually older and have multiple chronic illnesses like hypertension, chronic obstructive pulmonary disease or diabetes.

Home visits by nurses, backed by a team of physiotherapists, pharmacists, dietitians and occupational therapists, help these patients cut down on unnecessary readmissions to hospital. This, in turn, frees up hospital beds for more acutely-ill patients. This programme won the prestigious 2014 United Nations Public Service Award.

Central Singapore is served by the National Healthcare Group (NHG). Anchored by Tan Tock Seng Hospital and its polyclinic network, key RHS initiatives include close clinical collaboration with Ren Ci Community Hospital, and transitional care programmes designed to help patients get discharged from the acute hospital.

In the west, the new Jurong Health Services (JurongHealth) was set up to first build a new general and community hospital, and then to enable its patients to have a "hassle-free" experience even after discharge.

Of the six clusters, two cluster groups were also given the responsibility to build up Singapore's capabilities in academic medicine. They were to serve as the critical drivers and platforms that enable important problems identified in the clinical setting to inform basic research. This effort, to bring scientific research from "bench to bedside", aimed to produce advances in clinical practice for the benefit of patients.

The formal establishment of the two Academic Medical Centres (AMC) in Singapore can be traced to two major reviews carried out in 2006. In that year, the Biomedical Science Review Committee (BSRC) was formed and tasked by the Government to review the progress made in Singapore's Biomedical Science sector since it was launched in 2000. The centrepiece of the BSRC's recommendations was that it was critical for Singapore to develop strong translational and clinical research to realise the full potential value of the investments in the BMS Initiative in terms of health, economic and social benefits. The Government accepted the BSRC's report and supported the implementation of its specific recommendations to establish a critical mass of translational and clinical research talent in the hospitals, grow flagship research programmes that leverage on basic and clinical research strengths in Singapore and set up strong investigational medicine units as well as health services research capabilities.

In 2006, the Biomedical Sciences International Advisory Council, comprising renowned scientists providing strategic advice and guidance for Singapore's BMS enterprise, also recommended that Singapore create formal management and governance structures to advance medical education, research and healthcare delivery. They identified the AMC as a well-established model in which hospitals with a triple mission of achieving excellence in clinical service, education and research are able to do so by integrating and synergising between these three important pillars of healthcare.

Following the Government's approval of this recommendation, two major hospitals were identified to work together with the two medical schools to launch the academic medicine initiative.

The National University Health System (NUHS) brought together, under a common formal governance framework, NUH and three Schools of the National University of Singapore (NUS), namely the Yong Loo Lin School of Medicine (YLLSOM), the Faculty of Dentistry and the Saw Swee Hock School of Public Health (SSHSPH). NUHS was incorporated in January 2008, with former Director of Medical Services Professor Tan Chorh Chuan as its first Chief Executive.

Prof Tan, currently President of NUS and Chairman of NUHS, is a key leader in Singapore's biomedical research initiative and a strong advocate for the development of academic medicine. According to Prof Tan: "Research must be regarded and supported as an absolutely essential element of our healthcare system. The formation of NUHS in 2008 has enabled us to create a very conducive environment to grow the pool of talented clinicians, faculty, researchers and students, and to facilitate productive synergies between medical education, research and clinical care. We have several outstanding research programmes which have substantially enhanced the quality of clinical care and both these strengths have, in turn, contributed greatly to further raising the quality of our education and training.

"Our investment in academic medicine is vital to ensure that Singapore medicine continues to meet the needs and higher aspirations of Singaporeans, to maintain Singapore's position as a key medical hub, and to reap the healthcare, economic and societal benefits from our broader biomedical research initiatives."

NUHS has focused on developing world-class research and clinical strengths in a number of areas. Of particular priority are cancer and cardiovascular disease, given their growing healthcare impact and their importance in the national biomedical agenda. As part of the formation of NUHS, the Government approved the creation of two new national speciality centres, namely the National University Cancer Institute Singapore (NCIS) and the National University Heart Centre.

Both these national centres have rapidly developed new peaks of excellence in diseases which are common in Singapore and our region, or in which the disease biology and treatment responses are significantly different in Asian populations. These advances have enabled new treatment options and improved clinical outcomes for patients in Singapore. A third national specialist centre, the National University Centre for Oral Health, has since been set up and will be housed in a new purpose-built Centre for Oral Health. It will provide expanded specialist dental services, as well as research and dental undergraduate/ postgraduate education.

▼ Push for academic medicine… it led to enhancements to the hands-on learning process (below, NUS medical students at Tan Tock Seng Hospital's Simulation and Integrated Medical Training Advancement Centre).

2005 - 2015

▲ Clown-tastic... the Caring Clowns performing at the Children's Cancer Foundation in 2010.

Caring Clowns, volunteers

The first clownmandment: Cheer up sick children

GO AHEAD, call us a bunch of clowns. We won't take offence. On the contrary, we see it as a compliment. After all, we are just part-time clowns who take our clowning very seriously. Once a month, we put on our funny red noses, our rainbow locks, oversized shoes and shiny costumes to try to put a smile on the faces of sick children at KK Women's and Children's Hospital (KKH).

We are a small group, formed in 2004 after a few of us met at a clown camp in Singapore. Over the last 11 years, we have had clowns come and go but the core of what we do remains strong. We have remained a rag-tag group of earnest volunteers aged from the early 20s to the 50s. We come from different walks of life: Teachers, researchers, mechanics, safety inspectors in the aviation industry, people who work in the hospitality industry, home makers and civil servants.

One thing we have in common is a heart for the young patients at KKH. We care for them so much that we don't just give our time, we also dip into our own pockets for our clowning activities. The costumes, with the shoes and the wigs, can cost anywhere from $300 to $500 and more but this is what volunteering is about. KKH does support the volunteers too, providing us water to drink, a room to change in and rest as well as balloons when we need it.

To show people how serious we are about our roles as volunteer clowns, we have our own set of Clownmandments. These are some guidelines drafted by us on how to behave and perform as a clown, and we follow them stringently. For example, we maintain some anonymity with the patients and their caregivers at the hospital. We are known by our clown names: Rojo, Beanzie, Tellie, Sunshine, Ronger, Scooby, Smiley, Mouse, CanDos, Ponggo, Shootie and Crayon. Sometimes, after we change out of our clown outfits, we bump into the patients we have just entertained. They don't recognise us in our regular clothes and have no clue it was us an hour before in white faces, red noses and big shoes performing for them. That's the way we want to keep it.

While we are one of the many resident volunteer groups at KKH, we have also performed for other children's institutions and hospitals like the Institute of Mental Health. You could say we have done a lot of clowning around.

We bring different skills to our group. We have musicians, magicians and even a balloon sifu (master) who can make just about anything from a balloon. We use the balloons to engage with the kids, especially if they have not seen a clown up close before. It helps soften our approach.

Our focus is the patient. If the patient needs us, we will be there to perform. We usually perform in a common area in the ward and the children watch us with their caregivers. Once in a while, we are allowed to perform at the cancer ward where the kids are strapped to a machine and they can't come out to see us. We sanitise ourselves, wear a mask and go from room to room to perform for them.

When we first started out, trying to get the group together once a month was a challenge as people get called back to work at the last minute or our own children fall ill. We are managing ourselves better now. After the first year, we also modified our costumes and make-up as some of the children found it overwhelming. Right now, our biggest challenge is keeping ourselves healthy. If we are sick, we are not allowed to perform for the children as they are so fragile.

It is very hard to see children suffering from serious diseases. Sometimes we get emotional when we see how sick some of them are and we just have to hold back the tears. Our ward walkabouts help them laugh and forget that they are sick, even if it is for a short while. The parents get a little break and the tension and sadness lift for a moment.

Research has proven that laughter is the best medicine. We are just playing our part.

The rapid growth of NUHS' capabilities was boosted by a substantial expansion of its leading-edge infrastructure. These include the Centre for Translational Medicine which opened in 2012, the 19-storey NUH Medical Centre which opened in July 2013 and the Tahir Foundation Building officially opened in 2015 which houses the SSHSPH and laboratories from the Faculty of Science.

As noted by Professor John Wong, Chief Executive of NUHS since January 2014, "the enhanced infrastructure together with the substantial and growing critical mass of clinical, educational and research talent, is enabling NUHS to deliver better patient care, train future generations of doctors more effectively and bring innovative treatments to patients through groundbreaking research. In short, NUHS is indeed well poised and able to help shape medicine for the future".

The SingHealth cluster has a long history in education and research. Anchored on SGH and the national specialist centres in the Outram campus, and the KK Women's and Children's Hospital (KKH), its role in academic medicine is to advance medical care to provide better care for patients through innovative research and through better training of healthcare professionals. Its partnership with Singapore's second medical school, the Duke-NUS Graduate Medical School (GMS), combines its clinical strengths and expertise with the strong education and research capabilities of Duke University in the United States (US).

Established in 2005, Duke-NUS GMS aims to produce clinician-scientists who will bridge the basic sciences and clinical medicine, and spur research vibrancy in Singapore's biomedical sciences scene. It complements NUS' YLLSOM, as each has its own unique focus. Both schools add diversity to the local educational landscape and form an integral part of the Singapore biomedical community, producing the doctors and clinician-scientists that Singapore needs to meet increasing demands for quality healthcare in the country.

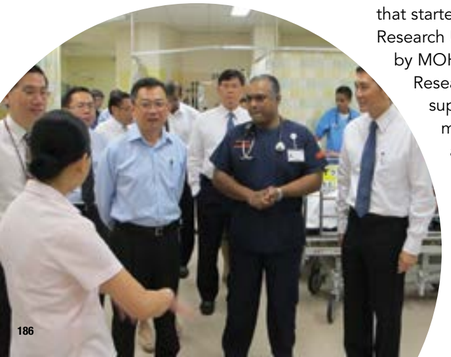
The then Chairman of the GMS Governing Board Mr Tony Chew, speaking at the groundbreaking ceremony, said the design of GMS drew inspiration from both American and local contexts and its compact 23,000 square metre site provided space for "wet-lab research, classrooms, teaching labs,

▲ Best of both worlds... the newly-upgraded National Heart Centre Singapore not only provided one-stop cardiovascular care for patients but also boosted interaction between researchers and clinicians.

2005 - 2015

▲ One patient, one health record… technology paved the way with the National Electronic Health Record (NEHR) which was rolled out in 2012.

▼ Planning for the future… Health Minister Gan Kim Yong (below, on a visit to NUHS) said the Healthcare 2020 Masterplan would help build "an inclusive healthcare system for the future".



and administrative offices". The building was opened in September 2009 by PM Lee Hsien Loong.

Professor R. Sanders Williams, Founding Dean of the GMS, said: "The GMS campus is next to SingHealth's national speciality centres and the Singapore General Hospital, which is the key tertiary-care teaching hospital. This physical proximity will facilitate close synergistic efforts between investigators at GMS and the doctors and clinician-scientists already on the SGH campus.

"Each will draw on the other's strengths, and together will catalyse clinical and translational medicine research and advance global health through the cross-fertilisation of ideas and efforts. This will be further enhanced through existing partnerships with the NUS and the Agency for Science, Technology and Research (A*Star) and their world-class researchers. It will spur biomedical research in Singapore, and move it several steps closer to being a world recognised hub."

Since its establishment, SingHealth's Duke-NUS Academic Medicine partnership has been centred on the formation of Academic Clinical Programmes – speciality-based programmes that cut across multiple institutions to facilitate collaboration amongst healthcare professionals in the areas of clinical care, education and research. These programmes are complemented by joint institutes of research and education, and SingHealth's Duke-NUS Disease Centres – such as the SingHealth Duke-NUS Head and Neck Centre – which bring together the collective strengths of specialists across various sub-specialities to provide holistic, patient-centric care.

Clinical research is also supported by the Singapore Clinical Research Institute (SCRI), a National Academic Research Organisation that started as the Clinical Trials & Epidemiology Research Unit (CTERU) in November 1996. Set up by MOH with funding from the National Medical Research Council (NMRC), its role was to support public sector research through multi-centre clinical trials, epidemiological and evidence-based medicine studies to established international standards.

In addition to its main function as an Academic Research Organisation, SCRI also undertakes the coordination of various clinical trial-related initiatives to support MOH, develops local research expertise and enhances the health research ecosystem to attract more clinical trials funded by pharmaceutical companies into Singapore.

A mandate for care integration

To prepare the healthcare system to support Singapore's seniors better, a clear mandate for care integration was needed. In 2008, Integrated Care Services (ICS) took on the additional role of supporting patients at home by linking them up with community care resources when they are discharged from hospital. A year later, ICS was renamed the Agency for Integrated Care (AIC).

It was set up as an independent corporate entity in 2009 to take on the role of national care integrator. Its expanded role was to coordinate patient referrals to the entire spectrum of ILTC services as well as play a pro-active role to support the growth and development of the primary care and community care sectors. In addition, it was to promote integration across the different care sectors.

AIC's Chief Executive Officer Dr Jason Cheah said its role is to take the strategic intent of patient-centric care beyond the hospitals into the community care sector and to strengthen the latter. He believes that most seniors desire to live and age in place, and the community care sector has much to offer to support that.

He added: "We work with a diverse group of healthcare stakeholders – the acute hospitals, community hospitals, nursing homes, GPs, home- and centre-based providers, and across the people, public and private sectors. We know they do their best for the patient when he or she is with them, but it is the linkages between the providers that AIC needs to pay particular attention to.

"AIC helps build the awareness, structures and integration so that patients transit seamlessly when they move between different care providers. Our role is to make that happen on the ground – by helping to expand capacity in the community, improve capabilities and standards of care, and facilitate conversations and processes about doing the best for our patients, not just when they are with us, but helping them to get to the next provider in the best way."

Minister Khaw also recognised that there was a need for institutions to be linked up, to enable care to take place in a patient-centric manner, with a "lifelong Electronic Medical Record for every Singaporean: One patient, one medical record, multiple clinics, multiple hospitals".

The National Electronic Health Record (NEHR) was rolled out in 2012, with the tagline "One Patient, One Health Record", and now covers all public sector hospitals, specialist outpatient centres and polyclinics as at August 2015. All community hospitals, close to 670 GP clinics and 102 other healthcare providers have access to NEHR as well. Work is ongoing to engage the remaining private healthcare providers not yet on board.

The NEHR will continue to evolve even as care models adapt to changing healthcare needs, guided by a Health IT Master Plan (HITMAP) jointly developed with public and private sector stakeholders.

The RHS was just one key piece in the complex mosaic to prepare the healthcare system for the needs of the new century. To enable the vertically integrated system to work, the primary and long-term care sectors needed strengthening too. Several pieces of the jigsaw would soon be put in place.

Improving accessibility, quality and affordability:

Healthcare 2020 Masterplan

After taking over as Health Minister in May 2011, Mr Gan Kim Yong presented the Healthcare 2020 Masterplan as a set of strategies to guide Singapore in building "an inclusive healthcare system for the future".

Its three strategic objectives – enhancing accessibility, quality and affordability of healthcare – had been mainstays of the public healthcare system since Singapore's founding. Now they were given renewed emphasis so that Singaporeans will receive healthcare when they need it, the healthcare provided will be of good quality and effective, and Singaporeans will be able to afford such services.

The Masterplan integrated many strands of policy and strategies for a cohesive and coherent road map for the rest of the decade. It factored in strategies to manage an ageing population and changing disease profiles which have led to greater demand for chronic care services. It comprised investing in seven strategies, including healthcare capacity, developing the regional health systems and preventive health as well as addressing affordability.

Adding more hospital beds

KTPH was the first new public hospital to be opened in the decade, in June 2010. With 590 beds, it was an important addition to serve the fast-growing community in the north of Singapore. The new hospital building fast gained accolades and awards, including the Building and Construction Authority's Green Mark Platinum Award in 2009 and the PUB's Water Efficient Building (Hospital Sector) - Gold Certificate in 2014, for its well-designed facilities, extensive use of greenery, and easy and hassle-free wayfinding.

Residents in the west got their own regional hospital in June 2015 with the progressive opening of the 700-bed Ng Teng Fong General Hospital (NTFGH), and the 400-bed Jurong Community Hospital run by JurongHealth. These two hospitals broke new ground as the first in Singapore to be designed and built together from the ground up as an integrated development, designed to complement each other for better patient care, greater efficiency and convenience for patients and their families.

Existing facilities were also expanded. The National Heart Centre in the Outram campus

▼ Go west… in June 2015, the 700-bed Ng Teng Fong General Hospital (below) opened its doors, giving residents of western Singapore their own regional hospital.

Dr Goh Soon Noi, Head of Medical Social Services, Changi General Hospital

Soft heart, hard head

TO BE a good social worker, you have to treat each case with compassion and respect. That requires a soft heart. You also have to make tough decisions related to the case. That requires a hard head. The good thing is that both can work in tandem.

Medical social workers often face cases that are very challenging. Besides the medical issues faced by the patient, there could be family problems that have been in existence for generations and we are expected to help them fix it all. No wonder, after 33 years as a medical social worker, I still find my work fascinating and enriching.

Ironically, it was divine intervention that landed me in social work. I wanted to be a psychologist, so I applied to the Public Service Commission in the 1970s to do psychology in university. That year, they didn't offer psychology and as social work was the closest to my first choice, I ended up at the National University of Singapore to read social work.

After working at most of the acute hospitals in Singapore, I had envisaged that my last stop would be at the National University Hospital where I would combine clinical work, research and education. I went to Melbourne University where I received my Ph.D. Again by divine intervention, I got involved in the commissioning of St. Andrew's Community Hospital since I was a member of St. Andrew's Cathedral.

The concept of a community hospital was new then and I was excited to be part of the early group to set up St. Andrew's. In fact, my experience in dealing with grassroots issues allowed me to pinpoint the needs at the time. When I was working in the acute hospitals, in the 1980s, many patients who were discharged from an acute hospital would have benefitted from a longer period of rehabilitation. However, because those services were not readily available, their families, being unable to handle their disabilities, admitted them to nursing homes. Invariably, these patients deteriorated further. I saw there was a need for rehabilitation, convalescence and respite care, which is what the community hospitals could provide.

From St. Andrew's Community Hospital, I went on to help start the social work departments in the then Ang Mo Kio Community Hospital and later Changi General Hospital. I applied what I had learnt when I joined Changi General in 1995; not only was rehabilitation and community care services inadequate, take-up rate was low among patients too. We would refer patients to rehabilitation and community service providers but they would neither not go nor see the value in it. We had to do a lot of hand-holding and support patients and their carers to use these rehabilitation and community services to ensure they remained well at home.

Around 2001, we started a Hospital to Community Coordinated Care (HCC) Project, extending the care beyond hospital. HCC is a Community Care programme where a team of social workers and nurses link up to manage complex care needs cases and coordinate care at a community level. It is this integration of the nursing, clinical and psychosocial perspective which helps to better meet the needs of the patients during the transitions from hospital to community. With funding from MOH in 2008, the project expanded to the current Aged Care Transition or ACTION programme.

Since its inception, Changi General Hospital has a rich experience working with the community in the East. The Eastern Health Alliance's partnership with South East CDC on the Neighbours for Active Living Programme further extends its reach into the community which we support at Eastern Health Alliance. Trained volunteers who live in the neighbourhood work with a care team to reach out to residents with multiple health issues and help monitor them. Currently the programme is available in Bedok, Siglap and Marine Parade.

Strong teamwork in the hospital is key to providing good care for patients and their families especially when dealing with difficult issues. We had a case where a 50 year old man was admitted to intensive care for a heart attack and needed help breathing through a tube. His family was not prepared to care for him when he had to be discharged and they did not want him to go into any residential facilities. They wanted him to remain in the hospital.

We not only worked with the family but the doctors, nurses and therapists as well to find a solution that worked for the family. It took a lot of team management.

As social workers, we see problems in a multi-layer manner, whether it is individual, interpersonal or organisational... or all three. So we take an eco-system approach to the solution. There is always more than one lever to pull to provide help and many entry points to provide help. But always with the soft heart, hard head approach.

◄ Outstanding MSW... Dr Goh Soon Noi received the Outstanding Social Worker Award in 2000 from the then President S.R. Nathan.

tripled in size, after moving into its new 12-storey building in March 2014. NUH also expanded, with the new NUH Medical Centre opening its doors in July 2013.

Next to come up was the 280-bed Integrated Building, opened in December 2014 in the east of Singapore. Jointly managed by CGH and SACH, it provides geriatric, psychology and rehabilitation services, among other services. Patients can expect to receive intensive therapy for their rehabilitation needs and benefit from a more seamless journey from acute to sub-acute care to recovery.

More new facilities are in progress. A new Yishun Community Hospital (YCH) beside KTPH is set to open by the end of 2015, and a new community hospital next to SGH is expected to be ready by 2020. These will add about 1,000 community beds to Singapore's healthcare system. Another new hospital complex, the 1,400-bed Sengkang General and Community Hospital, is due for completion in 2018.

Collectively, these new facilities are expected to increase the number of inpatient beds from 6,900 public hospital acute beds and 800 community hospital beds in 2011, to nearly 9,000 acute hospital beds and to 1,800 community hospital beds by 2020. The capacity in the long-term care sector – nursing homes, home care, day care and day rehabilitation facilities – will be more than doubled by then. More investments are also being made in primary care, with six more planned polyclinics or primary care facilities expected to be completed by 2020.

Also in the pipeline for the northern region is the Woodlands Integrated Healthcare Campus, to be built on a 7.7 hectare site along Woodlands Avenue 12 and Woodlands Drive 17. It will be an integrated healthcare facility that will include an acute hospital, a community hospital and a nursing home, providing about 1,800 beds in total. Its facilities are planned to open progressively from 2022.

Transforming primary care

For many years, MOH had provided subsidised primary care services through the polyclinics. The intention was that the majority of primary care should be provided in the private sector, with the

9,000

Approximate number of inpatient beds expected in Singapore's acute hospitals by 2020. By that time, there should also be approximately 1,800 community hospital beds

► Looking ahead… Community Health Centres (right, in a National Healthcare Group mobile clinic) were part of MOH's strategy to support private sector GPs in caring for patients with chronic conditions.

polyclinics looking after the needs of lower-income Singaporeans. However, an interesting trend emerged over the years.

Findings from the Primary Care Survey 2010, commissioned by MOH, showed that private GP clinics were the main provider of primary care services, seeing 81 percent of primary care attendances, with the polyclinics seeing the remaining 19 percent of attendances. In the case of chronic conditions, however, the private GP share and polyclinic share was about equal.

It was clear that reaching out to private sector GPs was critical to ensuring that Singaporeans had access to affordable, quality care across private and public sectors for treatment of acute and chronic conditions.

▼ Say CHAS… all Singapore citizens who meet the household monthly income criterion can use their CHAS cards for subsidised medical and dental treatment.

Professor Kandiah Satkunanantham, then Director of Medical Services, was especially concerned about primary care. He said: "Primary care is one of the critical elements of our healthcare system, so when I championed the Primary Care Master Plan, I felt that the general practitioners needed to move beyond their traditional focus of looking after acute conditions to becoming family physicians, caring for patients throughout their life journey and helping them manage chronic conditions as well."

The Primary Care Partnership Scheme (PCPS) was first introduced in 2000 to provide portable subsidies for elderly, lower-income Singaporeans to seek treatment at a conveniently located primary care provider, and covered largely acute conditions. In 2009, PCPS was expanded to cover chronic diseases as well. It built upon the Chronic Disease Management Programme (CDMP), introduced in 2006 in an effort to engage GPs to improve chronic disease management and also increase the affordability of lifelong chronic disease treatment for patients.

PCPS was renamed the Community Health Assist Scheme (CHAS) in 2012 and expanded to cover even more Singaporeans by lowering the age floor to 40 years and raising the income criteria. Finally, the age criterion was removed altogether. As of January 2014, all Singapore citizens, regardless of age, who meet the household monthly income per person of $1,800 or less can qualify for CHAS. Depending on their income levels, CHAS participants are given a blue or orange Health Assist card which entitles them to subsidised medical and dental treatment. It also gives them subsidised referrals to Specialist Outpatient Clinics in public hospitals or the National Dental Centre when necessary. This enables them to manage their chronic diseases earlier and avoid complications while enabling GPs to play a greater role in the care of patients with chronic diseases.

Patients with chronic conditions can now benefit from CHAS subsidies to lower their bills, and then further defray their out-of-pocket costs with Medisave use via CDMP. Starting with diabetes mellitus in October 2006, CDMP by 2015 covered a total of 19 chronic conditions, including stroke, asthma, chronic obstructive pulmonary disease and dementia. Patients are allowed to withdraw up to $400 from their own or immediate family member's Medisave account to cover the cost of outpatient treatment of these conditions.

Beyond liberalising Medisave use and expanding portable subsidies, MOH explored two innovations to support private sector GPs in caring for patients with chronic conditions, and to enhance their practice: Family Medicine Clinics and Community Health Centres.

The Family Medicine Clinic (FMC) is a multi-doctor family practice model, based on a private practice business model, with support from a Regional Health System on clinical and other matters. The FMCs bring together groups of family physicians to practise under one roof. GPs in the FMCs share resources and can take advantage of economies of scale when caring for patients. They encourage shared care programmes between hospitals and GPs, and reinforce the role of GPs as "first-line" doctors.

Community Health Centres (CHCs) are facilities that provide off-site ancillary support services such as health education provided by nurse educators, diabetic retinal photography and diabetic foot screening to GPs in their vicinity.

Frontier FMC was the first FMC to be set up. A partnership between NUHS and Frontier Healthcare Group, it opened its clinic in Clementi in May 2013. By June 2015, it had seen 3,068 patients with chronic conditions (the bulk of them referred from NUH's specialist outpatient clinics), 7,499 acute cases and 3,639 customers who walk in for services like health screening. NUHS has announced plans to set up another FMC in Choa Chu Kang by 2106.

This innovative FMC model won the Most Innovative Project/Policy (Gold) Award at the Public Sector's PS21 ExCEL (Excellence through Continuous Enterprise and Learning) Awards Ceremony 2014.

In his update on primary care efforts during the

▲ Under one roof… the Family Medicine Clinic allows groups of family physicians to practise in the same location.

2005 - 2015

Rokiah Sulaiman, Principal Enrolled Nurse, National Heart Centre of Singapore

Passing on the passion

NURSING runs in my family. My aunt was a nurse, I am a nurse and so are my daughter and niece. It is in the blood.

When I was young, in the 1960s, I watched my aunt go to work every day in her nurse's uniform and that inspired me to become a nurse. My aunt, Salmah Haji Mohammad Idris, used to work at Alexandra Hospital and the Heart Centre and she would talk to me about what she did at work. Even when my family moved to another kampong and, as a result, I saw less of my aunt, my interest in nursing stayed strong and I would observe their work whenever I had to go to a clinic.

Despite the avid interest in the profession, I ended up working as a secretary after I finished with school as my family was poor and I had to start earning money quickly to support my family. Then one day in 1980 I saw an advertisement in the newspaper for nursing and I applied for it immediately.

I really enjoyed my time at the School of Nursing and then working as a nurse at Singapore General Hospital after I graduated in 1982. I was even chosen to march in the nurses' contingent at the 1982 National Day Parade. It was hard work practicing for the parade but I was so happy and proud.

In 1987, I had to stop work to care for my sick mother-in-law and look after my children.

When I eventually did go back to work in 1994, it wasn't nursing at first. I took up a job as a welfare officer in Muhammadiyah for a few years as it gave me time to look after my children. Then, in 2001, I saw a back-to-nursing advertisement. It felt like the job was calling me back, so I contacted the Ministry of Health (MOH)... and here I am today, a nurse again!

◄ Aunty inspirational... Rokiah Sulaiman's aunt Salmah Haji Mohammad Idris (left, in her younger days) as a nurse, inspired her to join nursing.

Following an interview at MOH, I was sent for a two-month retraining course before I started work as a Principal Enrolled Nurse at the Heart Centre.

It was challenging coming back to nursing. Things are so different now compared to when I joined the service in the 1980s. The pace is different, it is faster now and there are more patients. There is also more technology to learn. But I am happy to be back and, even though I am still learning and trying to keep up with the energy levels of my younger colleagues, I rarely feel tired. That's because helping people gives me a lot of satisfaction.

I think the next wave of nurses from my family got started in 2010. I won the Tan Chin Tuan Nursing Award that year and my niece Siti Nabilah Yusof, who was 16 at the time, saw photos of me receiving the award. After talking to me and going through some old pictures of me at work and marching in the 1982 parade, she made up her mind.

I was thrilled when she told me she wanted to be a nurse like me. After her O-levels, she enrolled in the nursing course at Nanyang Polytechnic in 2011 and now works at Khoo Teck Puat Hospital. She once asked me: "How do you tahan (take) the pressure? It's so tiring." I told her when you have a passion for the job, you can overcome anything.

What was surprising was my daughter, Rohani Abdul Jalil, joining the profession too. She used to be a flight stewardess and I never knew she had a passion for nursing. I don't think I influenced her much as she has always had her own mind. But I am happy she made her own decision to join nursing as we need more nurses in Singapore. She too trained at Nanyang Polytechnic in 2012 and works at Khoo Teck Puat Hospital.

I am very proud that so many members of my family are part of the nursing profession. It is such an important job. Nursing is a skill you can use every day, even outside a healthcare setting. When people need medical help, you have the skills to be that help.

Three generations of nurses... Rokiah Sulaiman (above) with her aunt Salmah Haji Mohammad Idris (seated) and her niece, Siti Nabilah Yusof.

2015 Committee of Supply debate, Dr Lam Pin Min, Minister of State for Health, said as of March 2015 MOH had developed six FMCs and six CHCs. A seventh FMC was to open at the end of 2015 in the Ci Yuan Community Club at Hougang Avenue 9.

Under Healthcare 2020, public primary care services would also be expanded, with new polyclinics in Jurong West and in Punggol, both to open by 2017. Another four were expected to be built by 2020, including one for Bukit Panjang. Older clinics would be refurbished to increase their capacity and incorporate age-friendly features such as barrier-free access, as in the Geylang and Tampines polyclinics. The Ang Mo Kio and Bedok polyclinics would be redeveloped, to meet the needs of the larger elderly populations in their respective regions.

With the aging of our population and increasing prevalence of chronic diseases, the need for good family physicians has become increasingly critical. Prof Satkunanantham noted that "it is quite demanding on a physician to provide for the varied health needs of patients in the community".

"The family physician requires not only to have expertise across the breadth of medicine and be adept at communication and counselling skills but also to help integrate care between the various healthcare providers. The introduction of the Family Physician Register in July 2011 and the Family Medicine Residency Programme was aimed at enabling this expertise and improving recognition for family physicians," he said. Selected individuals will also be funded under the Family Physician Development Plan for postgraduate training in family medicine.

Taken together, the polyclinics, FMCs and CHAS clinics provide good quality, subsidised care to Singaporeans close to their homes as over nine in 10 HDB dwellers live within 15 minutes, by public transport, of a polyclinic or CHAS clinic.

Ramping up the ILTC sector:
Public-private partnerships

The Healthcare 2020 Masterplan also focused on developing the long-term care sector with a variety of new measures, both to increase capacity and to set standards for their services. The Ministerial Committee on Ageing (MCA), chaired by Health

7

Family Medicine Clinics in Singapore by the end of 2015

► Healing at home… home-care services like visits from doctors (right), nursing care, palliative care for those with terminal illnesses and even meals-on-wheels for seniors who cannot buy or prepare their own meals are being expanded.

Minister Gan, oversaw the ramp up in aged-care services and facilities significantly to improve access of such facilities to the elderly.

Nursing home capacity will see a significant increase under the Build-Own-Lease (BOL) model introduced in 2012. The Government bears the full capital cost of construction and owns the nursing home but tenders out the operating rights to an operator to reduce the financial burden on VWOs who wish to expand their aged-care services.

MOH will also continue to open up the provision of subsidised nursing home services to private operators, through the use of the ongoing portable subsidies or inviting the private sector to tender to operate BOL projects.

Finally, the Government will also operate three or four nursing homes with a total of 1,000 beds by 2020, which would make up about six percent of the total bed capacity then. The intention is not to dominate the market but to use these homes as platforms where innovations and new care models can be tested, allowing the Ministry to better understand operational issues on the ground.

VWOs have quickly seized the opportunities presented under the Masterplan. Several homes have moved from older premises to bigger new buildings in recent years. Bright Hill Evergreen Home moved from its premises in Senja Crescent to its new nine-storey building, developed under MOH's BOL scheme, in Punggol Field in October 2013. It has day rooms on every floor for residents to congregate for social and recreational activities and for meals.

The Villa Francis Home for the Aged moved from its original site in Mandai to Yishun, also in 2013. The Singapore Christian Home, which takes in residents of all faiths, was opened in Sembawang Crescent in January 2014, leaving its old premises in Jalan Tan Tock Seng.

Ren Ci Nursing Home expanded its reach when it opened its Bukit Batok premises in January 2015. Besides its community facilities, the new Ren Ci home houses a senior-care centre that provides services such as day care, day rehabilitation and nursing services. A floor is dedicated to residents with dementia.

Encouraged by MOH's effort, the National Trades Union Congress (NTUC) announced in July 2014 that its first nursing home would open in Jurong West the following year. It said it was also prepared to invest in another five homes in the next three to five years. MOH welcomed the rising interest of service providers like NTUC Health into the nursing home sector.

Community-based centre facilities for the elderly, or Senior Care Centres (SCCs), were also expanded. Situated at the void decks of housing flats, for example, they are near home and in familiar surroundings for those needing their services.

The SCCs provide physiotherapy and occupational therapy services to help patients regain their functional abilities following incidents like a stroke or fracture. SCCs may also provide general monitoring, personal care and a range of activities to engage those with dementia as well as support working family caregivers, including the provision of respite care facilities.

Home-care services, aimed at supporting families and caregivers looking after the health and social needs of the elderly, are also being expanded. These services include home medical care where doctors visit the patient at home for consultations, home nursing care, palliative home care for those with terminal illnesses, meals-on-wheels for seniors who cannot buy or prepare their own meals, and escort or transport services for seniors with medical appointments.

With these plans ongoing, MOH will increase the number of nursing home beds from 9,800 in 2014 to 17,000 beds by 2020. SCC places will double from 3,100 to 6,200 and home places increase from 6,500 to 10,000 by 2020.

To keep pace with the infrastructure increase, providers will get assistance through the Healthcare Manpower Development Programme to upgrade their skills through training and conferences.

The AIC Learning Institute also provides community health providers a wide range of workforce developmental and skills training programmes. Its training directory consolidates learning opportunities relevant to the sector, from nursing to leadership courses, as part of its commitment to help build the professionalism and competence of the ILTC workforce.

In the longer term, MOH is also looking at ways to increase the long-term care workforce and better utilise volunteers in care delivery.

Enhancing standards

Guidelines to ensure quality of care for seniors have kept pace with the ramping up of facilities. Senior Minister of State for Health Dr Amy Khor said in the March 2014 Committee of Supply debate in Parliament that the Enhanced Nursing Home Standards, which spell out expectations of standards for clinical care, psycho-social well-being and organisational excellence for nursing homes, had been developed. These guidelines took effect from April 2015 but nursing home operators would have a one-year grace period to fine-tune their operations before enforcement begins in 2016. Similarly, guidelines have been established for home, community and palliative care services.

AIC rolled out the new Nursing Home IT Enablement Programme (NHELP) in August 2014, to cover 36 homes over the next three years. Aimed at improving resident care in the homes, AIC will also work with home-based care, community care and palliative care providers to improve their services.

Growing the healthcare workforce

The Masterplan also covered investment in education, training and career progression for doctors, nurses and allied health professionals. Healthcare is expected to need about 20,000 more workers by 2020. With more capacity rapidly coming on-stream, the recruitment and training of these professionals have become

▼ Under one roof… the Villa Francis Home for the Aged (below) was one of the many VWOs that gained from the Healthcare 2020 Masterplan's push to improve facilities and set standards for service.

2005 - 2015

Mr Selvarajoo Kumarappan, active blood donor and volunteer blood donation drive organiser

Getting 700 people to pay it forward

I HAVE donated blood 89 times since I was 18 years old. I am 54 now. I started when I was serving National Service and my friend asked me to join him when he made his donation at our army camp.

I must confess I was a little frightened, expecting to feel pain when the needle went into my vein or giddiness after donating as some of my friends told me I would feel very weak. As it turned out, I felt fine.

I am passionate about blood donation because I survived a major operation soon after I was born, thanks in part to donated blood. My family members never let me forget that and always remind me that I have to repay that kindness somehow.

After that first donation, I began to donate every three months. That's the recommended time to let your body recover from each donation. From then on, I would go to the blood bank at the Singapore General Hospital or the National University Hospital to donate during my lunch breaks.

When I started working as a technician for a local bus company 37 years ago, the job required me to work shifts. But I still made it a point to donate blood every three months. In those days, there weren't the stringent checks of today. I don't remember filling up forms or answering questionnaires. I would give my identity card to the blood bank staff to record my particulars, they would check my weight and blood pressure and then I would proceed to donate.

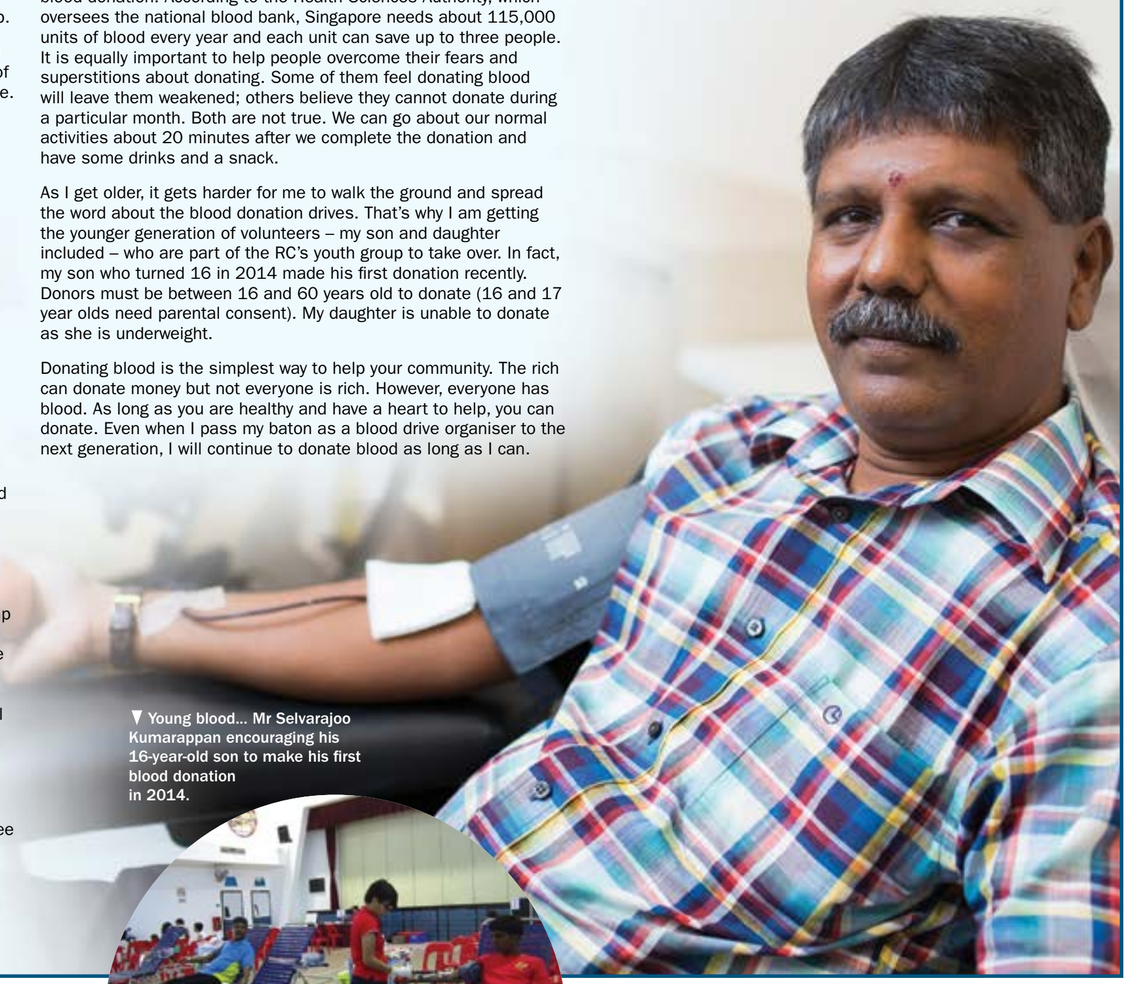
Nowadays, it is a much more careful process to ensure the donated blood is not tainted with infectious diseases. Health screeners ask donors about their medical history, where they have travelled, take their height, weight and blood pressure. Once someone is cleared for donation, a nurse cleans the donor's arm, applies local anaesthetic and inserts the needle into the vein. As the blood begins to flow into a flexible plastic bag, the donor is asked to pump a soft ball with the donating hand to help the flow. Once about 450ml of blood (or one unit of blood) has been collected, the nurse clamps the tubing and fills two test tubes with the donor's blood. These tubes are sent for testing while the bag of blood is stored in a cooler until it is taken to the blood bank where it's kept in special refrigerators. It is all very simple and the donation process is completed within 45 minutes.

In 1998, I started volunteering at the Residents' Committee (RC) in my neighbourhood in Chua Chu Kang. When I suggested that we start a blood donation drive in the neighbourhood, the RC committee agreed. In March 2001, we worked with the Red Cross to hold our first event and collected 57 packets of blood that day. In 2013, we started organising blood drives at the Chua Chu Kang Community Centre too and averaged around 700 bags of blood every year.

I think it's important to help people understand the importance of blood donation. According to the Health Sciences Authority, which oversees the national blood bank, Singapore needs about 115,000 units of blood every year and each unit can save up to three people. It is equally important to help people overcome their fears and superstitions about donating. Some of them feel donating blood will leave them weakened; others believe they cannot donate during a particular month. Both are not true. We can go about our normal activities about 20 minutes after we complete the donation and have some drinks and a snack.

As I get older, it gets harder for me to walk the ground and spread the word about the blood donation drives. That's why I am getting the younger generation of volunteers – my son and daughter included – who are part of the RC's youth group to take over. In fact, my son who turned 16 in 2014 made his first donation recently. Donors must be between 16 and 60 years old to donate (16 and 17 year olds need parental consent). My daughter is unable to donate as she is underweight.

Donating blood is the simplest way to help your community. The rich can donate money but not everyone is rich. However, everyone has blood. As long as you are healthy and have a heart to help, you can donate. Even when I pass my baton as a blood drive organiser to the next generation, I will continue to donate blood as long as I can.



▼ Young blood... Mr Selvarajoo Kumarappan encouraging his 16-year-old son to make his first blood donation in 2014.

a matter of urgency. A variety of strategies have been employed including expanding the intake of the medical schools, attracting home overseas-trained Singaporean medical students through pre-employment grants, improving remuneration and recognition, as well as recruitment of qualified foreign professionals.

Singapore today has three medical schools – the YLLSOM in NUS, Duke-NUS Graduate Medical School and the Lee Kong Chian School of Medicine in Nanyang Technological University (NTU).

The Duke-NUS Graduate Medical School, a collaboration between Duke University in the US and NUS, started its training programme for clinician-scientists in 2007.

Singapore's newest medical school, NTU's Lee Kong Chian School of Medicine, was jointly set up by NTU and Imperial College London, with NHG as the clinical partner. It took in its first intake in August 2013 with a curriculum designed to train young doctors to tackle Singapore's key health challenges and serve its population's future needs. It will award a joint medical degree from NTU and Imperial College London after a five-year programme.

Said Professor Chee Yam Cheng, then the Group CEO of NHG: "Lee Kong Chian Medicine is the second undergraduate, and the third medical school in Singapore. The National Healthcare Group is honoured, privileged and ready to fulfill its critical role as the principal clinical partner in this historical endeavour. A unique feature is the early introduction to patient interaction in the primary care setting where each student will follow up patients longitudinally over the years in their home and community environment. They will better appreciate the impact of chronic illness on the people they serve.

"With a fast-ageing population, the needs of the elderly for medical and social care must be adequately addressed by health professionals, social workers and counsellors. Doctors alone are insufficient to deliver this team-based approach to efficient and appropriate

▼ Three of the best… the Duke-NUS Graduate Medical School is one of three medical schools in Singapore. The others are the Yong Loo Lin School of Medicine and the Lee Kong Chian School of Medicine.

► Star power… the push to draw young Singaporeans to the nursing profession saw its career prospects and remuneration enhanced while a branding campaign that included a nursing drama serial (right, actresses Zoe Tay, Xiang Yun and Sheila Sim undergoing training for their roles as nurses) provided more visibility.

care. Hence team-based learning as the main pedagogy will help build and foster the skills necessary for team-based care. Lee Kong Chian Medicine will ensure that its graduates will meet the medical needs of Singaporeans now and in the future."

Nursing and the allied health professions also saw significant initiatives in advancing nursing clinical practice, leadership, education and career advancement. Nursing education had been significantly upgraded over the past decades – first with the establishment of the Registered Nurse (RN) training in the then newly established Nanyang Polytechnic in 1993, together with Physiotherapy, Occupational Therapy, Diagnostic Radiography and Radiation Therapy, followed by an expansion of nursing diploma numbers in Ngee Ann Polytechnic. Enrolled Nurse (EN) training likewise was shifted to Institute of Technical Education in January 2000.

The new Alice Lee School of Nursing set up in NUS introduced nursing degree programmes and the inaugural batch of nurses started their course in 2006. With higher levels of training, the role of nurses also expanded. For example, the Masters-level Advanced Practice Nurse programme equips these highly-trained nurses to work as independent partners of doctors in their respective specialisations in complex treatments.

Allied health professionals (AHPs) were also offered opportunities to upgrade their skills when the Singapore Institute of Technology (SIT) was opened in 2009, offering degree programmes for polytechnic diploma holders through its collaborations with overseas university partners and Singapore's five local polytechnics. SIT was made Singapore's fifth autonomous university in March 2014.

Standards in training conduct and practice are set by the Allied Health Professions Council (AHPC), a professional board under MOH in accordance to the Allied Health Professions Act 2011. It registers and issues practicing certificates to AHPs and regulates the professional conduct and ethics.

Significant changes were also made to the remuneration, recognition and career progression for nurses under the report and recommendations of the National Nursing Task Force, released in 2014.

Changing the public perception of nursing – as a worthwhile career with good prospects for personal and career advancement – was given added impetus with the implementation of a branding campaign in 2013. It highlighted the significant changes the profession had undergone. Called Care To Go Beyond, the campaign used a variety of communication strategies to reach out to school leavers, influencers, opinion leaders and the public at large. They included social media platforms, advertisements and a television drama series. Since 2013, it also integrated the hitherto standalone recognition platforms such as the prestigious annual President's Award for Nurses, presented by the President of Singapore, the national Nurses' Merit Award and the annual Nurses' Day celebrations to carry the same messages about nursing as a worthwhile career.

Doctors in the public sector also saw a review of their recognition and reward system. It factored in the complexity of their work, quality outcomes and workload, while strengthening the recognition for doctors who play crucial roles in education, administration, leadership and research.

These revisions, as Mr Gan said in May 2012, were part of the "continuous effort to make healthcare sector careers more attractive and better recognise the critical role that our public sector healthcare professionals play".

The specialist training system underwent major change in 2010 when the new residency programmes were introduced in stages. These structured training programmes were run by clinician educators and their administrative staff. It provided protected time for training and faculty development and enabled the public sector hospitals and polyclinics to respond to the healthcare manpower required for the increased capacity and to produce clinician educators, specialists and family physicians for the future.

New century, new diseases

With the ageing population and changing lifestyles, Singapore faces a growing threat in non-communicable diseases (NCDs). The growth of these chronic illnesses, coupled with the arrival of new diseases, keeps MOH on its toes. The often repeated ultimate aim is "not just to add years to life but to add life to years" and to reduce the burden on the healthcare system.

MOH's key weapons against NCDs are health promotion and preventive health services to improve the overall health of Singaporeans. Health screening is a major strategy to better manage NCDs such as diabetes and cancer by early detection of risk factors or their pre-disease states. The Check Your Health programme, begun in 2000, now covers diabetes, hypertension, high blood cholesterol and selected cancers such as breast, cervical and colorectal cancers.

The National Healthy Lifestyle Campaign, first launched in 1992 by then Prime Minister Goh Chok Tong, continues to take a central place in health promotion and education efforts. The theme changes each year – for example, healthy youths, obesity, healthy shopper and so on.

The widely recognised Healthier Choice Symbol is now a part of everyday life in food shopping, as is the campaign to ask hawkers for less oil, less salt and more vegetables for Singaporeans who eat out. This is significant as the National Nutrition Survey 2010, conducted by the HPB, showed that 45 percent of residents eat out six times a week or more (for any meal in the day) at hawker centres, coffee shop stalls and food courts. Nine in 10 also dined at Western fast food restaurants (for any meal in the day) once a week or less. HPB also works with central kitchens supplying food to coffee shops, workplace canteens and even those supplying "tingkat

▼ Pyramid of health… The Health Promotion Board helped Singaporeans make better choices when grocery shopping by placing the Healthier Choice Symbol on healthier items.

Siti Rasyidah Lokman Hadan, long-time patient at National University Hospital

Colours of my life.... in hospital

NUH is my second home. I've known its yellow walls in the paediatric ward since I was diagnosed with lupus at the age of 13. A year later I had kidney failure which saw me go through two modes of dialysis – peritoneal (every day) and haemodialysis (twice a week). At 18, I was diagnosed with Crohn's Disease (inflammatory bowel disease) and, a year ago, my heart decided not to function properly, partly due to the renal failure. I had to have a pacemaker put in.

It's no surprise then that I know my care team at NUH (National University Hospital) really well – they have been with me on my medical journey since I was barely a teenager. I am grateful to the army of medical officers and housemen, whom I call the "blue scrubs", who ensure my treatment proceeds without any hitches.

After being in and out of NUH at least five to 10 times a year for the past decade, my family and I have first-hand experience of how healthcare has progressed in Singapore. My mother keeps saying that we are very lucky that we have good doctors who can stabilise me quickly and react fast to the sudden complications that pop up. For instance, I think I was one of the first patients to try Belimumab, a medicine that suppresses lupus, when it was made available in Singapore. Unfortunately, I was also one of the very few patients who developed complications due to this drug.

According to the research, there was a small chance of patients like me getting cancer... and guess what? They found that I had cancer in my non-working kidney. As this was during my preparation for a kidney transplant, the medical team mediating between donors and recipients didn't think I was a good candidate to receive the kidney. Thankfully, the renal team worked hard and fast to get me cleared of any form of cancer six months before the transplant in May 2015.

As if that didn't make the transplant interesting enough, there was another aspect that made it even more so. My parents have always wanted to donate one of their kidneys to me, but they don't match my blood type. When the transplant team found a matching donor for me, they realised the donor's family member also needed a kidney... and my mother was a match!

In an "exchange programme" of sorts, my mother donated her kidney to this patient and I received a kidney from the patient's family member. I haven't had time to process my mother's and my donor's generosity. It has been an intense year. In fact, it has been an intense 10 years.

To be brutally frank, I am not the easiest patient in the world. I get moody and upset, especially when my body throws up one challenge after another to my doctors. I started painting two years ago when I was put in isolation while my doctors investigated the "medical mysteries" that my body was presenting. I was so angry I gave everyone the silent treatment, even the doctors. Everyone was worried and a child therapist was called in. My mother forced some paper and oil pastels on me and, when no one was around, I started drawing. I realised my feelings get converted into energy when I draw. By the time I am finished, I feel numb. The first painting I drew had a lot of black, blue and brown colours. It was like a Wild Wild West desert scene you see in old movies.

Painting eventually became a way to deal with the long periods of time I spend in the hospital. When NUH medical social workers talked to me in 2012 about Project Dreamcatchers, where they help young patients deal with chronic illnesses through art, I thought it was cool to be part of it. They organised art sessions in the hospital's "art cabin", a room where all the patients hang out to work on their art pieces. My time with Project Dreamcatchers has helped me cope better with my health issues. The time I spend with the team is very relaxing and I have fun working on my art pieces.

To be honest, I did not expect to get any attention for my art. That said, I confess I do feel proud when I see one of the paintings I gave the professors on my care team as a small form of gratitude displayed in one of the hospital's meeting rooms.

Now that I've had my transplant, I have to try and work out how to have a normal life without dialysis. I want to work on my stamina as I can only walk very short distances before getting very exhausted. I want to go back to school. I am thinking of taking up A Levels privately. With my conditions, I can't plan for the big stuff or for the future, so I plan for now.

Dreamcatchers is an adolescent chronic illness peer support group at NUH conceived in 2011. It is made up of a unique group of adolescents living with various forms of childhood chronic illnesses, including rare genetic and heart conditions, spina bifida, end-stage renal failure and diabetes. The name was inspired by the Native American arts and crafts tradition where a hoop of willow decorated with feathers, arrow heads, and beads, is believed to have the power to catch all of a person's dreams, trapping the bad ones, and letting only the good dreams pass through to them.

The NUH Dreamcatchers range the ages of 11 years old and above, all of whom are involved at different levels of the programme, which helps them affirm that their conditions are not disabling. Project Dreamcatchers, an annual visual arts exhibition born out of the programme, gives these young people a chance to share their lives and stories through art.

◄ Art in emotion... Siti Rasyidah, who is with the NUH's Dreamcatchers progamme, working on her art pieces in 2011.

meals" to homes to offer healthier choices.

In recent years, many more innovative programmes have been launched. For example, the One Million Kg Challenge was launched in March 2014 to encourage Singaporeans to collectively lose that amount of weight by 2016. Attention has also turned to specific groups like bus drivers over the age of 40 and taxi drivers to teach them better driving postures to manage back pain as well as encourage healthier eating habits and regular health screenings. These initiatives are the joint effort of many parties – MOH and HPB, unions, public transport operators and the six healthcare clusters. The encouraging results from these two groups will see them being extended to other specific target groups.

The National Tobacco Control Programme and workplace health promotion are also long-standing programmes. HPB's role also includes proposing measures with more bite than just education. It recommends taxation and legislative strategies to curb tobacco supply. To discourage the habit, Singapore has one of the highest tobacco taxes in the world. In addition, the sale of tobacco products such as shisha has been banned since 2014 and a point-of-sale display ban for cigarette packets will come into effect in 2016.

The mental health of the nation also occupies an important place in the quest for overall good health. Singapore's vision is to have an emotionally resilient and mentally healthy community with access to community-based, comprehensive and cost-effective mental health services.

An all-inclusive approach is adopted to address the mental health needs of the population, covering the mentally healthy, those who are at risk, those who have a minor psychiatric morbidity and those who have mental disorders. This approach requires a stronger relationship between mental health services and the wider healthcare sector, as well as consideration of the social and physical environment. It also requires inter-agency collaboration in planning and implementing policies that have implications on mental health.

The National Mental Health Blueprint 2007-2012 was launched to promote mental health, prevent the development of mental health problems and disorders and reduce the impact of mental

2016

Year when a point-of-sale display ban for cigarette packets will come into effect

2005 - 2015

► Bringing cheer during the festive season... Senior Minister of State Dr Amy Khor visits patients at SGH during Chinese New Year.

disorders. It was followed by the Community Mental Health Master Plan in 2012. Both plans focused on strengthening core mental health services for the detection, intervention and rehabilitation of mental health patients, especially in the community.

Dr Khor, reporting on the progress of mental health efforts in Parliament in 2015, assessed that success had been achieved in three areas, although there was more to be done.

HPB is the main driver for national mental health promotion and disease prevention programmes for the population. It aims to raise awareness and understanding of the importance of mental well-being and empower individuals to have lifestyle knowledge and skills to strengthen their personal mental well-being. It also wants to improve the understanding and symptoms of mental health problems and encourage people to seek help early as well as to reduce discrimination against people with mental health problems.

As part of integrating mental healthcare, a series of multidisciplinary community mental health teams were formed to integrate and strengthen community partners to focus on early detection and treatment of mental health problems. Programmes have been developed to address the needs of different demographic and target groups.

These include Response, Early Intervention and Assessment in Community Mental Health (REACH which targets youths), Community Mental Health Teams (aimed at adults) and the Community Psychogeriatric Programme (for the elderly). The Job Club, run by occupational therapists, medical social workers and job placement officers, helps recovering adults find work.

As Dr Khor said in the 2015 Committee of Supply debate in Parliament, it sometimes "takes a village to enable patients to recover well in the community". Community capability to deal with mental health issues had been considerably strengthened in recent years.

The Institute of Mental Health's (IMH) after-care programme supports discharged patients assessed to be at higher risk of default or with more severe illnesses. They are reminded of follow-up treatment through regular telephone calls and even home visits. A 24-hour Mental Health Helpline provides immediate support for patients and their caregivers when needed. The line is open to community partners, even if the cases have no records with IMH.

Community support is strengthened by building local networks among grassroots leaders and volunteers, social work agencies, the police and town councils. This enables them to respond better to residents with mental health issues. Dr Khor said more than 400 grassroots leaders and volunteers in 20 constituencies had been trained in 2014.

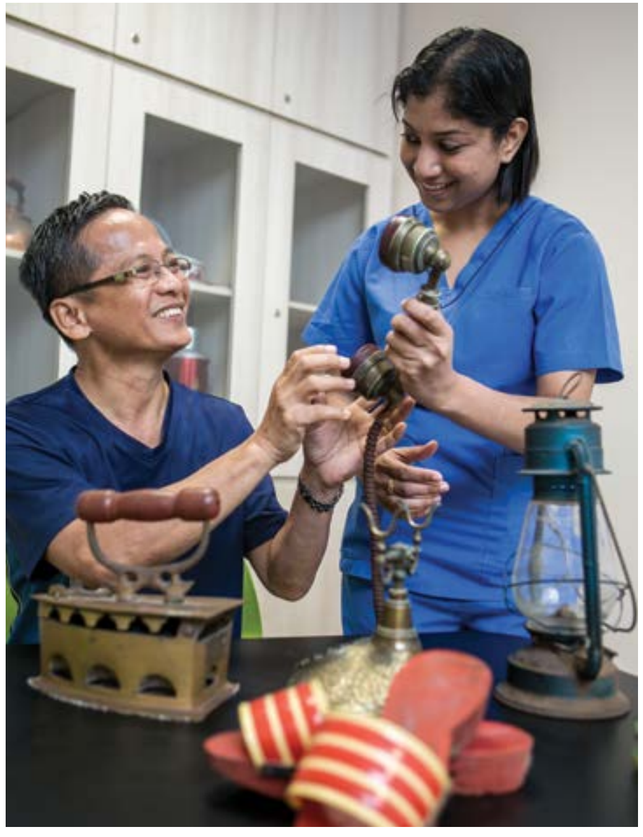
The capability of primary care to help detect and support the treatment of mental health patients has been strengthened too. Since 2012, 70 GP partners have been trained to attend to mental health patients and nine community-based specialist and allied health teams set up to support GPs with clinical advice and allied health services. These teams have served over 4,700 patients, providing them with access to holistic care closer to home.

Under the Community Mental Health Masterplan launched in 2012, the target set for 2017 is to train and partner 120 GPs, set up 17 allied health and specialist-led teams in the community with the capacity to serve up to 21,000 clients, and engage 50 constituencies.

Tackling emerging ***infectious diseases***

While the public conversation had mostly focused on ageing and its attendant issues and needs, MOH had also significantly strengthened Singapore's capability to fight new and emerging diseases. This included rationalisation of the public health services, and management of diseases such as SARS, Chikungunya, vector borne diseases and other pandemics.

The rationalisation took place in 2003 when MOH became responsible for the surveillance, prevention and control of all communicable diseases. The Ministry of the Environment (renamed Ministry of the Environment and Water Resources in 2004), with which MOH had worked closely, remained responsible for the environmental determinants of health such as vector control and public and food hygiene.



▲ Call to better mental health… the Institute of Mental Health's Sunshine Wing uses elderly- and dementia-friendly features (like this old telephone in this posed picture) to help elderly patients evoke old memories.

This is the way we wash our hands...

Clean hands, no disease… well, that was the aim of the Health Promotion Board (HPB) when it teamed up with the makers of a disinfectant to create this activity book for preschool and primary school children in 2012. Not only did it include HPB's recommended 8-step hand-washing technique, it also had a catchy jingle titled "Washy Washy Clean" to appeal to the youngsters. Statistics have shown that clean hands can reduce cases of infectious diseases such as diarrhoea, flu and HFMD (Hand, Foot and Mouth Disease) by 45 percent.

Besides SARS, there was the problem of avian influenza A (H5N1) in the early 2000s. Global concern that avian flu could mutate to transmit easily between people led MOH to publish its first version of the influenza preparedness and response plan in 2006. It also created a stockpile of flu vaccines. The National Influenza Pandemic Response Plan is built around a colour-coded DORSCON (Disease Outbreak Response Condition) framework. Working off a baseline colour of green, the alert and response phases move from yellow to orange to red.

Influenza A or H1N1-2009 was the 21st century's first flu pandemic and Singapore was not spared.

The first cases on the island were detected in May 2009 and, by September, it was estimated that 270,000 people were infected. With sustained infection in the community, isolation and containment measures were stepped down.

However, over the next few years, it would become apparent that MOH's efforts were shifting from managing isolated disease outbreaks such as H1N1 to being on permanent alert against continuing infectious disease threats such as the Middle East Respiratory Syndrome Coronavirus (MERS-COV) and the Ebola Virus Disease. First appearing in Saudi Arabia in 2012, MERS-COV still persists in the Middle Eastern peninsula today and sporadically shows up in other countries. In 2015, an outbreak affecting 186 people in South Korea left 36 of them dead.

MOH has also had to play a supporting role when other public health challenges threaten Singapore. To combat the perennial haze problem, MOH works within the Inter-Agency Haze Task Force (HTF), comprising 23 ministries and government agencies. Set up in September 1994, HTF co-ordinates their respective action plans to mitigate the effects of haze on the public.

MOH readies the public healthcare system to cope with anticipated demand and issues advisories to residents to moderate their outdoor activities, taking into consideration their health status, physical capacity, environmental conditions and any existing chronic heart and lung conditions. The stockpile of N95 masks was also distributed at cost to retail outlets for subsequent resale while low-income families received them for free under a separate community-based distribution exercise.

Dengue has proven to be difficult to control, with outbreaks occurring more frequently and with greater intensity. The largest outbreak happened in 2005 with over 14,000 cases and 27 deaths. Another outbreak of 8,826 cases in 2007 saw 24 deaths. A new threat arrived in the form of Chikungunya fever in November 2006. The disease was made notifiable in December 2008 after persistent outbreaks happened island-wide.

Gift of life:
Boost to organ donation

Significant changes were also made in a key piece of legislation – the Human Organ Transplant Act (HOTA). When HOTA was enacted in July 1987, it empowered the harvesting of kidneys from Singaporeans and permanent residents, except Muslims, who died accidental deaths. However, the number of organs available for transplant was still low, and patients in need saw their wait times increase. After extensive public consultation, the Act was widened in January 2004 to cover all causes of death and transplant of the liver, heart and cornea. It also regulated living donor transplants.

The year 2008 marked a milestone in HOTA. Then Health Minister Khaw Boon Wan successfully moved amendments to HOTA that included harvesting of organs from Muslims. The move was supported by a fatwa, or religious edict, from the Islamic Religious Council of Singapore which allowed Muslims to come under HOTA. In moving the bill, Mr Khaw said there was a greater burden of kidney failure among Malays and their inclusion would put them on par with patients on the transplant waiting list.

The amendments also included regulations on living donor transplants to protect the safety and well-being of donors as well as to ensure they were not under any pressure to make the donation. It also prohibited any trading in organs and blood, both deemed unethical, and gave MOH power to prosecute offenders. The amendments on enforcement came into effect in May 2008.

The first case to be prosecuted, and which sparked off heated public debate, involved well-known retail magnate Tang Wee Sung, executive chairman of the C.K Tang retail company. In July 2008, he was charged in July with trying to buy a kidney for $300,000.

Opinion was divided between those who thought organ trading was repugnant and supported MOH for upholding the law, and those who felt the law was heartless and too restrictive as it did not even allow reimbursements to donors for their expenses.

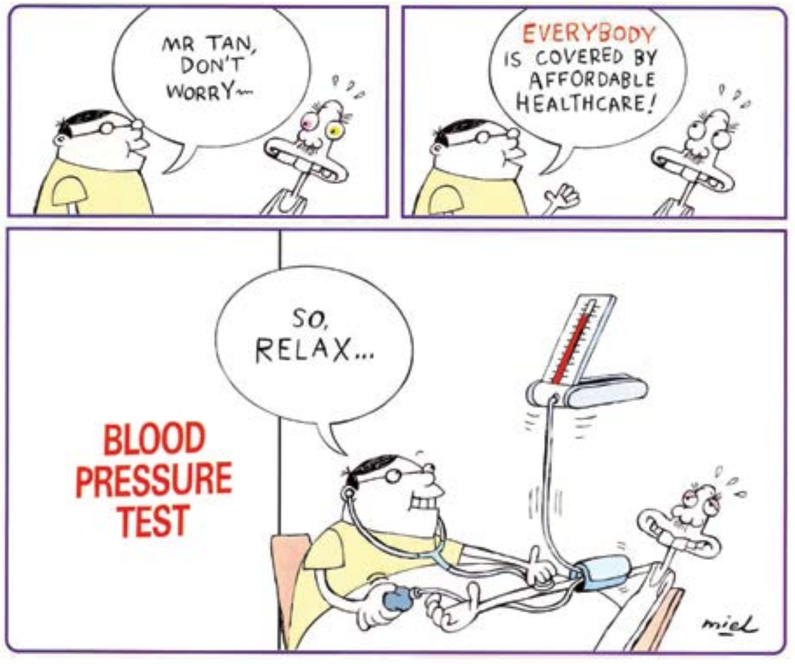
The middle ground was reached when MOH moved an amendment in 2009 that allowed the reimbursement of reasonable donation-related costs and expenses – short- or long-term costs, insurance, and loss of earnings – but it still did not mean organ trading was condoned. The amendment also covered paired-donor matching.

These legislative changes were supplemented by a public campaign titled Live On, to help raise awareness and change mindsets on organ donation. The aim was to let it be seen as the ultimate gift of hope, compassion and life. The National Kidney Foundation set up the $10 million Kidney Live Donor Support Fund in November 2009 to help organ donors with their medical expenses.

▲ No chickening out… part of being prepared for bird flu outbreaks included this 2008 exercise by the Agri-Food & Veterinary Authority at Tuas Training Village which saw 1,500 chickens culled, disinfected and incinerated.

Affordable healthcare:
Greater peace of mind for patients

Even as MOH delivered on its Healthcare 2020 commitments to expand healthcare capacity and extend the range of services provided, changes in the delivery system and evolving social and demographic trends necessitated a recalibration of the financing system. This involved the 3Ms of Medisave, MediShield and Medifund. MOH reviewed its healthcare financing policies in three



► Making light of heavy concerns… part of MOH's push to reassure people that healthcare would remain affordable included using cartoon strips in a Means Testing pamphlet produced in 2009.

ways. First, to improve the scope of coverage as the range of services expanded. Second, to build on the universal coverage offered by government subsidies to cover more Singaporeans under MediShield and Medisave. Third, to reduce out-of-pocket costs by increasing subsidies, insurance coverage and Medisave use.

MOH's budget for healthcare subsidies continued to rise, with the opening of new facilities (hospitals, nursing homes, and community care centres) and as new programmes under Healthcare 2020 were rolled out. In particular, the expansion of CHAS to allow more Singaporeans access to subsidised primary care from GPs, the new mental health programmes to support care in the community and enhanced screening for common conditions.

Alongside the expansion of subsidies, refinements were also made to the subsidy system to address changing demand patterns and to better identify those who need them most. The main strategy to help lower-income Singaporeans cope with hospital bills has been through heavy subsidies for patients in B2 and Class C wards. In the ILTC sector, targeted subsidies had been in place since 2000 so Singaporeans with lower per capita household income could receive higher subsidies in nursing homes and community hospitals.

As subsidies in acute hospitals were based on ward type, irrespective of the patient's ability to pay, middle-income patients often preferred to stay in the subsidised wards of acute hospitals rather than move into the community hospitals where their out-of-pocket costs would be higher due to their means-test outcomes.

In addition, with improvements made to subsidised wards and services, higher-income Singaporeans became more attracted to subsidised services. This created greater competition for the same health subsidies. In January 2009, means-testing was introduced in acute hospitals, so that subsidies could be better targeted and healthcare could become more affordable for lower-income Singaporeans. The desire was to ensure that the overall healthcare system remained sustainable for the country as a whole. At the same time, it proved a useful subsidy lever to support MOH's overall goals in developing the regional health systems and facilitating movement of patients out of acute hospitals into the ILTC sector, where warranted.

Higher-income patients could continue to choose the subsidised wards and receive at least 65 percent subsidy in Class C but they would pay more than low-income patients who receive 80 percent subsidy in the same class of ward.

In 2012, ILTC subsidies were further enhanced for middle-income patients, to facilitate the flow of patients between the acute and ILTC settings.

MOH's approach – to better target subsidies at the lower income groups whilst simultaneously expanding the same subsidies – has helped reinforce progressivity of benefits in terms of access to healthcare. As a result of these changes, the Government's spending on healthcare doubled from $4 billion in 2011 to $8 billion in 2014.

Changes to government subsidies were accompanied by other enhancements to the 3Ms framework so that Singaporeans could better afford their share of healthcare costs.

The use of Medisave was progressively liberalised to help reduce out-of-pocket cash payment by patients in the inpatient setting, as well as to promote right-siting for the management of chronic diseases in the outpatient setting. In 2006, Medisave use was expanded to cover four chronic conditions via the CDMP. The list of chronic conditions under the CDMP has been gradually expanded over the years to a total of 19 conditions in 2015. Medisave use has also been expanded to cover recommended screenings and vaccinations that could prevent costly hospitalisations.

As Medisave usage is made more flexible, Singaporeans would need to save more in their Medisave accounts to ensure sufficient balances for their healthcare needs during old age. The Government raised employer Medisave contribution rates by 1 to 1.5 percentage points over this period, and most recently by another percentage point in January 2015. Currently, Medisave contribution rates stand at 8 to 10.5 percent of monthly salary, depending on age.

The Government also provided Medisave top-ups to various groups of Singaporeans, to help with their lifelong healthcare needs. Lower-income Singaporeans receive Medisave top-ups under the Workfare Income Supplement scheme – a wage credit programme for older low-wage workers – to help them save for healthcare needs during their retired life. In 2012, the Government introduced annual Medisave top-ups for eligible elderly (85 percent of all elderly) under the GST Voucher Scheme. Babies born on or after 1 January 2015 will receive a $4,000 Medisave grant to help support their healthcare costs, such as their insurance premiums and vaccination costs.

MediShield too has also been systematically enhanced over the years. Designed to protect Singaporeans against large hospitalisation bills, its key co-payment features of claim limits, deductibles and co-insurance were retained even as enhancements were made. In 2006, Integrated Shield Plans (IPs), which comprise both a MediShield component and an additional private insurance component provided by approved private insurers, were introduced to allow Singaporeans more choice in insurance coverage.

As MediShield benefits were designed to cover the costs of subsidised wards in the public hospitals, patients who preferred to use non-subsidised wards in public hospitals or private hospitals would need higher insurance coverage. IPs are required to have co-payment features similar to MediShield, and their renewability is guaranteed so that policy-holders do not have to fear losing their coverage should they fall seriously ill.

▼ Hmmm, what can the 3Ms do for me… as Singaporeans got to grips with Medisave, Medifund and MediShield, MOH produced a 3Ms booklet in 2013 which served as a guidebook to the various healthcare schemes and subsidies available.

More protection, lower bills

MediShield Life is new (it replaces MediShield from 1 November 2015). So it is crucial that all the people covered by it – Singaporeans and Permanent Residents – know how it provides better healthcare insurance coverage for life. That's why MOH produced this booklet which explains MediShield Life's benefits and premiums as well as how Integrated Shield plans work with it.

Singaporeans could use their Medisave to pay for IPs, subject to a withdrawal limit.

To increase the protection provided by MediShield, auto-coverage of Singaporeans was implemented upon their first contribution to CPF or marriage registration. A series of auto-cover exercises for newborns, children and youths also came into effect between 2007 and 2011. These and other measures improved overall MediShield's coverage of our resident population from 76 in 2004 to 93 in 2014.

In 2007, enhancements were also made to the ElderShield scheme, the nation's severe disability insurance scheme. Payouts were increased to $400 per month while the payout period was extended to 72 months. ElderShield policyholders wanting to obtain higher severe disability insurance coverage could also purchase ElderShield Supplements, which offer additional benefits at different pricing levels. This meant that Singaporeans would have a wider choice of severe disability insurance products to meet their individual needs.

For patients who still face difficulties paying for their medical bills, Medifund provides an important safety net. In 2007, Medifund-Silver was introduced to ensure that sufficient Medifund support is available for elderly patients above the age of 65. In 2013, Medifund was also extended to support patients who need help with primary care expenses at the polyclinics, dental and other services.

However, as our population continues to age, public concerns over healthcare costs continue to surface. During the Our Singapore Conversation in 2013, where Singaporeans from all walks of life shared their aspirations and concerns for the future, healthcare affordability emerged as one of top concerns. Also brought up was the issue of declining family support, due to an ageing population, rising singlehood and smaller families. As participants shared ideas on how existing systems could be improved to help Singaporeans cope with life's uncertainties, they agreed that there was a need to better manage risks as a society and to help each other through difficult times.

To ensure that the healthcare financing framework continues to reassure Singaporeans about the affordability of good quality healthcare, MOH

◄Thank you, pioneers… flash the Pioneer Generation card and you receive additional subsidies for outpatient care, cash assistance if you are disabled and annual Medisave top-ups for life.

embarked on a major review in 2013. It resulted in three major policy shifts. First, to increase the Government's share of healthcare expenditure. Second, to continue to expand Medisave use. Third, to increase societal risk-pooling. Together, these measures were designed to reduce out-of-pocket payments for healthcare.

The first shift to increase the Government's share of healthcare expenditure involved enhancements of healthcare subsidies in primary care as well as specialist outpatient care. CHAS had earlier been introduced in 2012 but was further expanded to cover a greater proportion of the population. Subsidies in Specialist Outpatient Centres were also enhanced in September 2014, and this was followed by enhancements to drug subsidies in January 2015. The reduction of medication costs was especially beneficial for patients with chronic conditions on long-term medication.

In addition, an $8 billion Pioneer Generation (PG) package to honour pioneer Singaporeans who contributed to our nation-building was also introduced. Pioneers receive additional subsidies for outpatient care, cash assistance if they are disabled, as well as annual Medisave top-ups for life. As Medisave was introduced only later in the working lives of these pioneers, they were unlikely to have accumulated sufficient Medisave for their retirement healthcare needs. The PG package thus sought to relieve their healthcare expenses.

Flexi-Medisave, for older patients above the age of 65 years, was also introduced from April 2015. This allows use of Medisave (up to $200 per year) for consultation fees, medical services, drugs and tests necessary for diagnosis or treatment of medical conditions.

The third and most significant shift was the introduction of universal insurance coverage under MediShield Life. Previously uninsurable Singaporeans, such as those who were too old or with pre-existing medical conditions, would also be covered by MediShield Life. The MediShield Life

2005 - 2015

"It was only until we met Singaporeans at our public dialogues who were born with certain medical conditions, or were caregivers for family members who were severely ill, that we realised how much MediShield Life could mean to our fellow citizens."

Ms Jasmin Lau, Deputy Director in MOH's Health Finance Division, who was part of the MediShield Life focus group discussions (above)

Review Committee, appointed in November 2013 to review its parameters, was tasked to consult widely with the public and key stakeholders to better understand their preferences and work out the implications and potential trade-offs thereafter. Thirty-six focus group discussions were held with over 1,200 Singaporeans over seven months, and another 500 contributed ideas and feedback via email.

It was indeed a busy, but exciting, time for the young policy officers working on this far-reaching policy change and supporting the Committee in the running of the focus groups.

Ms Jasmin Lau, Deputy Director in MOH's Health Finance Division, reflected: "It was only when we met Singaporeans at our public dialogues who were born with certain medical conditions, or were caregivers for family members who were severely ill, that we realised how much MediShield Life could mean to our fellow citizens. People who could never buy health insurance because of their existing medical conditions live in constant fear about not being able to pay their medical bills. The conversations we had with them and the stories we heard from them keep us going. It motivates us to deliver MediShield Life, all the way from conceptualisation to actual implementation."

Ms Louisa Zhang, a senior health policy analyst in the Health Finance Division, added: "During the focus group discussions, we encountered a wide range of participants. Some viewed the policy only in terms of how it would benefit or disadvantage them - one guy kept insisting he would never get ill and it was unfair to make him join MediShield Life and pay higher premiums to cross-subsidise unhealthy Singaporeans. While such views were frustrating, we knew that this was probably how some other Singaporeans felt too, and we would need to come up with a reasonable compromise."

The Committee's recommendations were accepted by the Government in June 2014 and received unanimous support from Parliament. Mr Bobby Chin, who chaired the MediShield Life Review Committee, noted that it had to "carefully weigh the merits of the many good suggestions and ideas we received against their benefits to the widest number of Singaporeans".

He added: "At the same time, we were mindful about keeping to the intent of the MediShield Life scheme and the need to ensure affordability. It was a truly humbling experience, to be entrusted with this responsibility to come up with a package that would be both impactful and yet affordable."

Indeed, the Committee's package of recommendations was a comprehensive one. It proposed radical moves like removing the lifetime claim limit and increasing the claim limit for each policy year. Daily limits for hospital stays and for surgical and outpatient cancer treatment would also increase. MediShield would move from being an opt-out scheme to a mandatory one. It would cover all Singaporeans for life, including those with pre-existing conditions.

However, better coverage meant that premiums would increase. The Government stepped in to provide close to $4 billion worth of support over five years, in the form of premium subsidies for the lower- to middle-income groups, transitional subsidies and to bring in those with pre-existing illnesses.

Following the Committee's report, implementation of the new MediShield Life continued apace, with the tabling of the MediShield Life Scheme Bill in Parliament. More than 20 Members of Parliament (MPs) spoke during the five-hour debate on the Bill, raising various concerns. Among them were how defaulters – in particular, those who were very poor or very old – would be treated as well as the need to safeguard confidential medical and income information. But these were satisfactorily addressed by the MOH office holders as the Bill was welcomed by all, in what MP Ms Denise Phua described as "the manifestation of the spirit of belonging to a country".

Indeed, as Minister Gan reflected at the Second Reading of the MediShield Life Scheme Bill in Parliament, "the idea of MediShield Life goes beyond healthcare and insurance. It is in fact a reflection of the kind of society we want to build. A more inclusive society – where we pool our resources together to help the vulnerable and the sick among us. And a more caring and progressive society – where those who are able will play their part while those who are needy receive more help".

MediShield Life would set the framework "not only for the introduction of universal coverage for all, but also for every Singaporean to play a part in nurturing an inclusive, caring and progressive society".

These changes mark a significant shift in our healthcare financing philosophy towards greater government responsibility, and greater collective responsibility through risk-pooling. Taken together with more flexible usage of Medisave, Singaporeans will face less out-of-pocket cash co-payments, and enjoy greater peace of mind about healthcare affordability in Singapore.

Any questions… the focus group sessions conducted by MOH officers and other volunteers were part of the MediShield Life Review Committee's consultation with the public and key stakeholders.

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Focus group discussions on MediShield Life were held with more than 1,200 Singaporeans over seven months. Another 500 contributed ideas and feedback via email

The well-being of my patients is my foremost priority.

I will perform my duties with integrity and passion.

I will care for my patients with compassion and respect.

Extract from the Healthcare Scholar's pledge, written by the 2013 cohort of healthcare scholarship recipients and recited at the annual Healthcare Scholarships Award Ceremony.

Every year, more Singaporean youngsters apply for the healthcare scholarships awarded by the Ministry of Health and MOH Holdings. In 2015, 301 talented and motivated youngsters received the healthcare scholarship. After attaining a degree in one of the various healthcare professions, they become part of the nation's public healthcare family and play vital roles in moulding the future of Singapore healthcare. But before they embark on their studies, all of them have to take this pledge.

Reaching for better health… Minister Gan Kim Yong joined a group exercise session at Woodlands Waterfront on 9 May 2015.

7 Looking ahead

Transforming for the future

2015 and beyond

Circle of life... the next phase for Singapore healthcare will focus on successful ageing in the community.

OVER five decades, Singapore has nurtured a healthy population and developed a world-class healthcare system that has grown in tandem with the nation since independence. Healthcare outcomes are amongst the best in the world, with life expectancy at 83 years in 2014 compared to 65 years in 1965. Premature mortality rates due to cancer, heart disease and stroke have also fallen considerably over the years.

These impressive healthcare numbers have been achieved with national health expenditure at only about 4 percent of the nation's gross domestic product (GDP) while providing universal coverage for Singaporeans with multiple layers of assistance. All the while, the country keeps pushing for more innovation to develop new cost-effective medical treatments.

Singapore's healthcare system is also rated highly within the international community. In 2014, Singapore topped the Bloomberg ranking of most efficient healthcare systems which looked at 51 countries. The annual ranking, compiled by the global financial news agency, tracks factors that include life expectancy, the cost of healthcare as a percentage of gross domestic product and total medical expenditure for each person.

Dr Jim Yong Kim, President of the World Bank, praised Singapore for its focus on delivering results. Speaking to a local news channel in 2014 while on a visit to Singapore, he said: "The bottom line is, what we see in Singapore is a Government that is extremely focused on execution and actually delivering results for their population which, at the same time, is completely open so that market forces and good government execution come together in the success story of Singapore."

Indeed it has taken a combination of bold innovative steps, pragmatism and deep commitment to care for our people to reach this far. As our healthcare journey advances into the future, Singapore will need to continue harnessing these qualities to progress, to ensure that our healthcare services are sustainable and able to continue beyond the Healthcare 2020 goals of accessibility and affordability while maintaining a high quality of delivering care.

There are several key changing realities to contend with on this journey.

One key challenge is Singapore's ageing population. The 2013 Population White Paper, produced by the National Population and Talent Division in the Prime Minister's Office, estimates that between now and 2030, more than a quarter of the current citizenry – over 900,000 people – will be aged 65 and older.

In an interview for this book, Minister for Health Gan Kim Yong was of the view that many Singaporeans, especially those who are still young, need to understand the impact of ageing: "When we talk about ageing in 2030, the young and healthy adults aged 45 to 50 now are the group that would be 65 and above then. This is a group that would be a key challenge. So this is the key shift going forward from 2015."

He added that this shift will have major implications down the line in terms of policy, infrastructure capacity and capability, manpower and financial sustainability.

"For example, we need to invest more heavily in geriatrics and in family medicine. Coupled with the shift in social norms and social structure, we are going to have less family support and therefore (our) whole support structure needs... to cater to a smaller family," he added.

To Mr Gan, this is a key concern: How, with Singaporeans enjoying generally good health and good healthcare services, we can move the system further, promoting and encouraging healthy living, and preventing healthcare problems further down the line?

"Healthy living is going to be a key driver. And, in order for us to be successful in healthy living, we must ensure that everyone has a sense of responsibility towards his or her own health. We need to shape the behaviour, shape the thinking... and to do that, we would have to make sure that our policies, our financing structure, our support system and programmes have to emphasise personal responsibility all through their life, and not just when they are sick," he added.

To stay ahead of the curve, the transformation of healthcare has begun in Singapore. Work is already in progress to put in place the pillars for a sustainable, future-ready healthcare system.

A nation for all ages

One area of such care transformation is to change the narrative about ageing – that ageing can be productive and not a burden. The ageing issue, which has been on the Government's radar since the 1980s with various committees under the auspices of different Ministries, requires a shift in mindset among the people.

The challenge of changing mindsets and perceptions was something already being looked at in the mid-2000s. The 2004 Committee on Ageing Issues, co-chaired by the late Dr Balaji Sadasivan, who was then Senior Minister of State for Health and for Information, Communication and the Arts, and Dr Mohamad Maliki Osman, then Parliamentary

▼ Pedal power… healthy activities like cycling (below, at East Coast Park), jogging and walking ensure that everyone takes personal responsibility for his health.

From bench to bedside

Three Singapore clinician-scientists share their thoughts on taking the road less travelled

Mentoring the next generation

Professor Wong Tien Yin

Medical Director, Singapore National Eye Centre; Provost's Chair Professor of Ophthalmology, National University of Singapore; Vice-Dean, Office of Clinical Sciences, Duke-NUS Graduate Medical School; Head of Academic Medicine Research Institute and Group Director, Research, SingHealth

WHEN I was in medical school, like many young doctors, I was hoping to get into a clinical specialist programme after housemanship. Ophthalmology was not even my first choice.

Then came two pivotal moments that shaped my career. First was a chance meeting with the late Professor Arthur Lim in the early 1990s, where he encouraged me to do ophthalmology. I got into the training programme which was to begin in 1996 after my National Service.

Then, in late 1995, I got the chance to meet famous ophthalmologist Professor Alfred Sommer from the Johns Hopkins University Wilmer Eye Institute. He had discovered the link between vitamin A deficiency, blindness and mortality – it had won him the Albert Lasker Award, known widely as the American Nobel Prize. After his lecture at the Singapore National Eye Centre, I had the opportunity to speak to him briefly and he invited me to spend a year with his team at Johns Hopkins.

I was accepted into a research fellowship, the Public Health Ophthalmology Programme, at Johns Hopkins, and published eight papers. That was my first 'bite' of research and I was hooked. In 1999, I left for my second stint at Johns Hopkins, this time to pursue a Ph.D. This was followed by a fellowship at the University of Wisconsin-Madison. I got my first National Institutes of Health grant, a pivotal paper in the Lancet in 2001 and my career as a clinician scientist was set. When I talk to medical students about the clinician-scientist track, I tell them a few things: It's a rough road, they must be convinced that they are going to take the longer, more winding, less certain path. They must have the passion for it. There have to be sacrifices along the way.

We are now seeing younger people taking up this challenge. I think they are looking for challenges... a purpose in life. They are more passionate about being able to do things differently and they are little bit more plugged into the global world. They see careers as evolving and not always doing the same job. This is a very different mindset from 10 years ago.

Some of it, of course, has to be attributed to the better funding and support structure of the biomedical science initiative in Singapore. And there is stronger mentoring for clinician-scientists. If I have a hope for SG100, it is that we have a Singaporean Nobel Prize winner!

To be a good scientist, be a good doctor

Professor Tan Eng King

Senior Consultant Neurologist and Clinician Scientist, National Neuroscience Institute; Vice-Chair (Research) and Professor, Duke-NUS Graduate Medical School

I MUST confess that, as a budding clinician, I had no ambition to be a scientist. But when I was training in Houston, Texas, in the 1990s, I was very inspired by my supervisors who were very involved in research work. When I came back to Singapore in 2000, there was an opportunity to be part of a group of pioneer researchers at Singapore General Hospital, and I took it.

To me, the term clinician-scientist is a misnomer. I think all doctors by and large try to do some form of research to come up with better solutions for their patients. It is a part of their training.

Academic work requires the extra effort. The burning interest has to be there. The way medicine is being practised now involves a concerted effort to link different specialities, clinical and non-clinical factors in a multi-disciplinary platform.

An exciting development now is Precision Medicine. In our mission to provide world-class healthcare and enhance patient care, Precision Medicine would allow for tailored treatment based on genomics, physical and physiological make-up of individuals. Health problems are pinpointed with minimal pain and risk for our patients. Solutions can also be planned out most efficiently, based on our patients' specific needs. Precision Medicine, based on the dual elements of sound medical studies and empathy for patients, combines our collective calling to treat the body and mind.

The challenge for doctors engaged in academic medicine is the uncertainty, especially when it comes to getting grant money for your research. It is very competitive, which is why some choose to give up. As a clinician, your job is guaranteed. As a researcher, there are no guarantees. The other issue is time. People who do clinical work struggle to find the time to do research.

However, the investment in biomedical research is encouraging and has encouraged doctors to step out of their comfort zones. One piece of advice I always give younger doctors who are thinking of taking up the clinician-scientist road is be good clinical doctors. Being a good doctor means that patients trust their lives to you. Being an even better doctor means that we are forward-looking and anticipate potential medical needs.

Making a difference

Dr Sue-Anne Toh Ee Shiow

Clinical Director, Regional Health System Planning and Development, Consultant, Division of Endocrinology, Department of Medicine, National University Health System; Assistant Professor of Medicine, Yong Loo Lin School of Medicine, NUS

IT WAS curiosity that first led me to embark on biomedical research. During medical school, we had opportunities to work on research projects and I simply chose one that I was curious about – a project to examine the effects of ginsenosides (active biochemical compounds in ginseng) on angiogenesis (the growth of new blood vessels) which could have implications for tumour growth in cancer and the process of wound healing.

My grandmother used to take ginseng so I was curious to learn if and how this herb could be beneficial in health and disease. I enjoyed working on the project but, as I had set out to be a doctor, I gave up doing research to focus on clinical training. I was well into my postgraduate clinical training when the manuscript of my undergraduate research work got published. As a result, my programme director encouraged me to take up a research project.

I believe that being a scientist helps me be a better doctor, and vice versa. What I find particularly rewarding is the prospect that our research findings could contribute towards a solution for a larger problem, one that impacts a bigger population. This is particularly relevant for Type 2 diabetes. At present, about one in 10 people in Singapore have it and about half of them might not even know they have it. The burden of the disease is huge, despite the fact that the disease and its complications are preventable. The realisation that our research work could contribute towards changing the course of diabetes in Singapore is most rewarding to me.

A clinician-scientist has the privilege and responsibility to make a difference not just at the individual patient level but also at a macro level, and make discoveries that could potentially translate into more widely applicable clinical practice.

Secretary for National Development and for Community Development, Youth and Sports, had said in a letter to Prime Minister Lee Hsien Loong: "We need to change the erroneous view that an ageing society means increased dependency. We believe that Singapore will be able to harness the economic and social possibilities and, at the same time, be prepared to tackle the challenges arising from an ageing population."

This led to the formation of the 2007 Ministerial Committee on Ageing, helmed by Mr Lim Boon Heng, then Minister in the Prime Minister's Office. Mr Lim developed a whole-of-Government response to the challenges. Three of its initiatives were the Wellness Programme, the efforts to promote re-employment and continuous education as well as the City For All Ages plan.

Since 2011, ageing issues have come under the Ministry of Health (MOH).

Senior Minister of State for Health Dr Amy Khor, who has been championing active ageing for some years, believes that an action plan for successful ageing is not about "adding just years to life, but adding life to years".

In an interview for this book, Dr Khor said: "Ageing is of course inevitable. The minute you are born, you start to grow old. Therefore you need to change the mindset about ageing – that it will become a burden. Ageing is not necessarily a burden because of medical advancements, diet,

▼ Sushi so easy... Senior Minister of State for Health Dr Amy Khor (below, learning how to make sushi with some seniors at the 50plus Expo in May 2015) believes that an action plan for successful ageing is not about "adding just years to life, but adding life to years".

► Plan being put into action… the City For All Ages is part of the Action Plan for Successful Ageing unveiled by the Ministerial Committee on Ageing in August 2015. The key features of the plan are to help Singaporeans age confidently and maintain strong bonds within the family and community.

City for All Ages

We will transform our city into an enabling place for Singaporeans to grow old in. Seniors can live independently, confidently and gracefully in their homes or in communities familiar to them.

More senior-friendly housing:

- **"Active Ageing Hubs" will be provided in at least 10 new HDB developments,** to provide both active ageing programmes for active and ambulant seniors, as well as day care, day rehabilitation and assisted living services (such as housekeeping and grocery-shopping) for seniors who are frail.

More senior-friendly transport:

- A **transport plan to refresh MRT, bus, pedestrian and road infrastructure** in the next ten years to be more senior-friendly.
- The plan addresses feedback that the Land Transport Authority has received to make public transport safer, more comfortable and more accessible for seniors.
- This includes having more intuitive signs for easier navigation at transport nodes, and to provide lifts at pedestrian overhead bridges used frequently by seniors.

More senior-friendly parks:

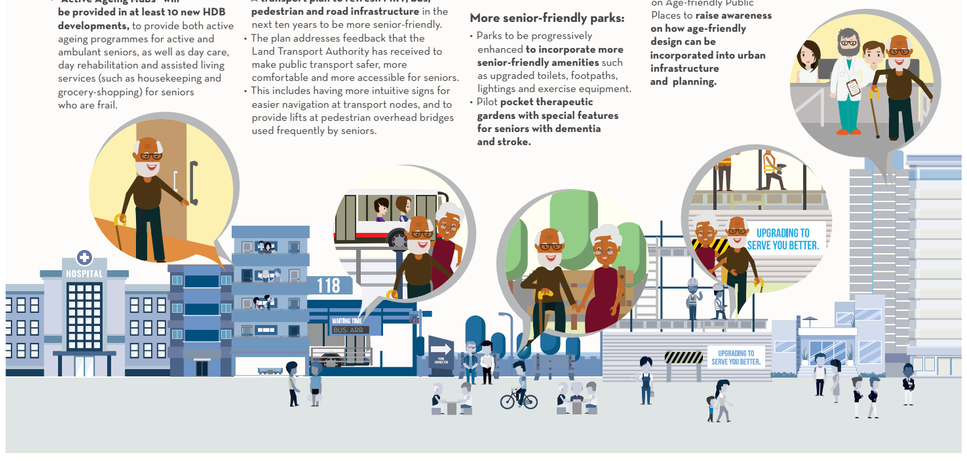
- Parks to be progressively enhanced **to incorporate more senior-friendly amenities** such as upgraded toilets, footpaths, lightings and exercise equipment.
- Pilot **pocket therapeutic gardens with special features for seniors with dementia and stroke.**

An age-friendly built environment:

- A Universal Design Guide on Age-friendly Public Places to **raise awareness on how age-friendly design can be incorporated into urban infrastructure and planning.**

More research into ageing issues:

- Up to $200 million set aside for a **National Innovation Challenge** to catalyse research related to ageing.



good health and so on.

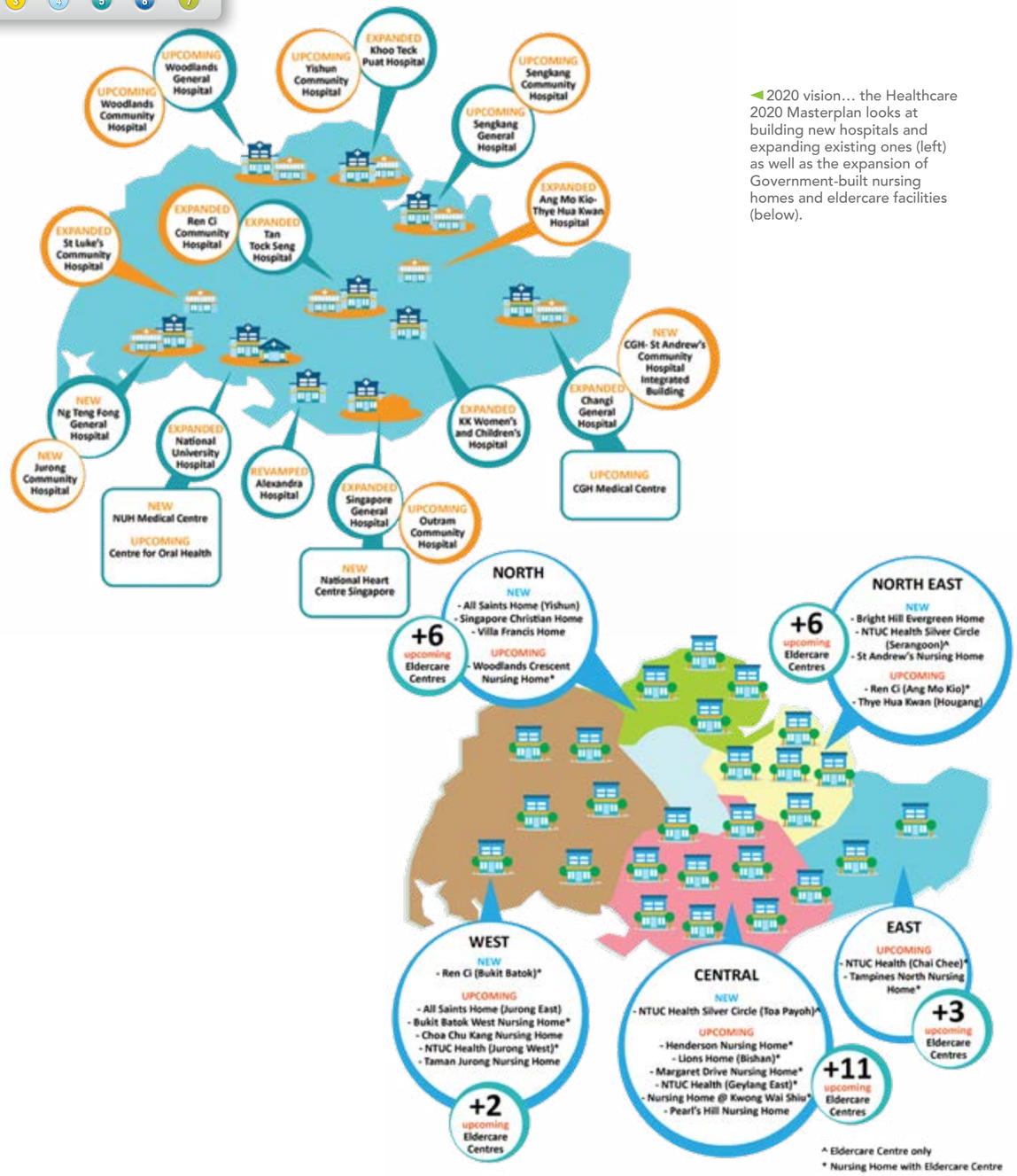
"There is really a wealth of experience, knowledge, skills that you can tap from the elderly. Many of the elderly people I interact with say 'even if we retire, we can still volunteer and benefit the community'. And there are also many who say 'I just want to work, I still want to contribute'. It does a lot for their self esteem."

She added that MOH is looking at lifelong learning, employability and volunteerism: "For lifelong learning, we are talking about a senior academy; for volunteerism, we are looking at how to support this desire to volunteer in a better way; and employability for older workers."

Under the City For All Ages plan, MOH has identified some constituencies with a higher proportion of elderly residents and has started piloting programmes there.

"We use them as a testbed and identify programmes we think can be scalable. We are preparing to be able to scale this up to other constituencies and, under City For All Ages, we have 16 constituencies now doing this," said Dr Khor.

Many of these ideas and initiatives found their way into the Action Plan for Successful Ageing. Announced in August 2015 by the Ministerial Committee on Ageing led by Mr Gan, who is also Minister-in-charge of Ageing Issues, the Action Plan is a $3-billion national blueprint plan to help Singaporeans age confidently and lead active lives



◄2020 vision… the Healthcare 2020 Masterplan looks at building new hospitals and expanding existing ones (left) as well as the expansion of Government-built nursing homes and eldercare facilities (below).

2015 and beyond

Dr Tham Tat Yean, Chief Executive Officer, Frontier Healthcare Group

Building a bridge between the community and the hospital

AS GENERAL practitioners, my five partners and I used to run our own clinics. But we had one thing in common: We wanted to make ourselves better family physicians. We didn't believe we were only cough and cold doctors. We wanted to be competent in chronic disease management and serve a full spectrum of patients. That's why we started Frontier Healthcare in 2002.

Therefore, when the National University Health System (NUHS) approached us in 2012 to set up a Family Medicine Clinic (FMC), we were thrilled. It was a natural extension of the passion my partners – Dr Chong Chin Kwang, Dr Koh Thuan Wee, Dr Sim Kok Peng, Dr Yeoh Kwee Kee, Dr Ng Siau Peng – and I shared about family medicine. It provided yet another opportunity to provide quality care to patients. As the partnership with NUHS would see chronic patients from the National University Hospital (NUH) referred to us private sector players, we knew we were pioneering a new business model that involves chronic patients that have more complex needs than what we usually encounter.

In 2013, we launched the Frontier FMC in Clementi. Working in tandem with our nine GP clinics, we like to think that the FMC is developing a culture of care we want to provide to the community. We want to help patients deal with chronic ailments better. We want to serve patients of all ages: Paediatrics, adults, geriatrics. And, of course, we are looking for innovative ways of managing a patient, be it using electronic medical records, IT platforms or data-driven care.

Our involvement with NUHS started long before the Frontier Family Medicine Clinic though. Since 2006, the six of us have been involved in teaching undergraduates at the Yong Loo Lin School of Medicine. When NUHS started a family medicine residency programme, we were again approached to be one of the strategic partners. The NUHS family medicine residency programme is unique because it brings in private sector players as faculty to train residents. When the Ministry of Health (MOH) mooted the idea of the FMC, Mr Joe Sim, CEO of NUH, was keen to work with us on the understanding that the FMC, besides providing clinical services, would delve into medical education and research as well. That resonated well with us as the FMC was really an extension of our medical education mission.

That said, there were some challenges in setting up an FMC. It was a new model and nobody knew what to expect. We also had to be conscious of our role in the healthcare system and not deviate too much from the costs a patient would have incurred at the hospital. Otherwise, if the FMC prices were higher, it would be very difficult to convince patients to come to us. We try our best to make things affordable for the patient, using the Community Health Assist Scheme (CHAS) and Pioneer Generation subsidies where applicable. It has been a tough balancing act. I have to be realistic and see this as a little bit of National Service.

We are glad to report that we have a high acceptance rate among patients. I need to credit the well-trained NUH staff for some of this. Its care coordinators take the trouble to inform patients about the price issues when they come over to the FMC. The specialists too try very hard to reassure their patients who are referred to us, telling them that the FMC is a partner of NUH. I am very grateful that people think of us in this way.

We also use technology to keep the transition seamless. We use the same medical records system as NUH and patients are pleasantly surprised when we inform them that we know what tests they have done at the Specialist Outpatient Clinics and that they can get their test results at the FMC. In their mind, they are not out of NUH, but in the ecosystem where their doctors are talking to each other and taking care of them. It shows the high level of trust and confidence NUH and MOH have in us. The proof of the transformation of care delivery is in the numbers: More than 3,000 patients have been referred to us from NUH since we started.

When it comes to delivering healthcare in today's sophisticated and complex environment, there are a few things we have to bear in mind. One is the connectivity with the community. Second, the endorsement and recognition of the professional status of the primary care provider. If we don't give recognition to family medicine and family care practitioners, it does to a certain extent hinder care for the patients. Patients will then think that primary care is second class medicine. I don't think it is in anybody's interest to perpetuate that view. We need to transform that kind of mindset to make sure that care can be more holistic and meaningful for everyone.

◄Primary care collaborators... Dr Tham and his fellow Frontier Healthcare Group partners who collaborate with NUH on a new model of delivering primary care.

while being bonded strongly to their family and community.

It covers 60 initiatives, covering 12 areas such as healthcare, volunteerism, employment, housing and transport. A new National Silver Academy will be set up to offer seniors a wide range of learning opportunities, leveraging on a network of institutions such as community organisations and post-secondary education institutions. Ongoing efforts to create a City for All Ages will be enhanced, including a transport plan to make public transport infrastructure more elderly-friendly.

Speaking to reporters about the announcements, Mr Gan said: "All of us know that Singapore's population will age quite rapidly over the next two decades, but what is important is that this ageing population need not be a burden to us. In fact, longevity is something that we can celebrate, we can look forward to. We can help Singaporeans age more successfully to make their senior lives more exciting, more rewarding, more fulfilling."

However, for the Action Plan to really work, multiple stakeholders must be involved. It requires the cooperation from individuals, their families, the community, non-governmental and volunteer-welfare organisations (VWO) as well as the Government.

Said Dr Khor: "You need everyone to be involved. The Government can put in all the infrastructure but, in terms of a social programme, if the community doesn't think it's their role, if the family thinks that it's the Government's role, it will then be a problem.

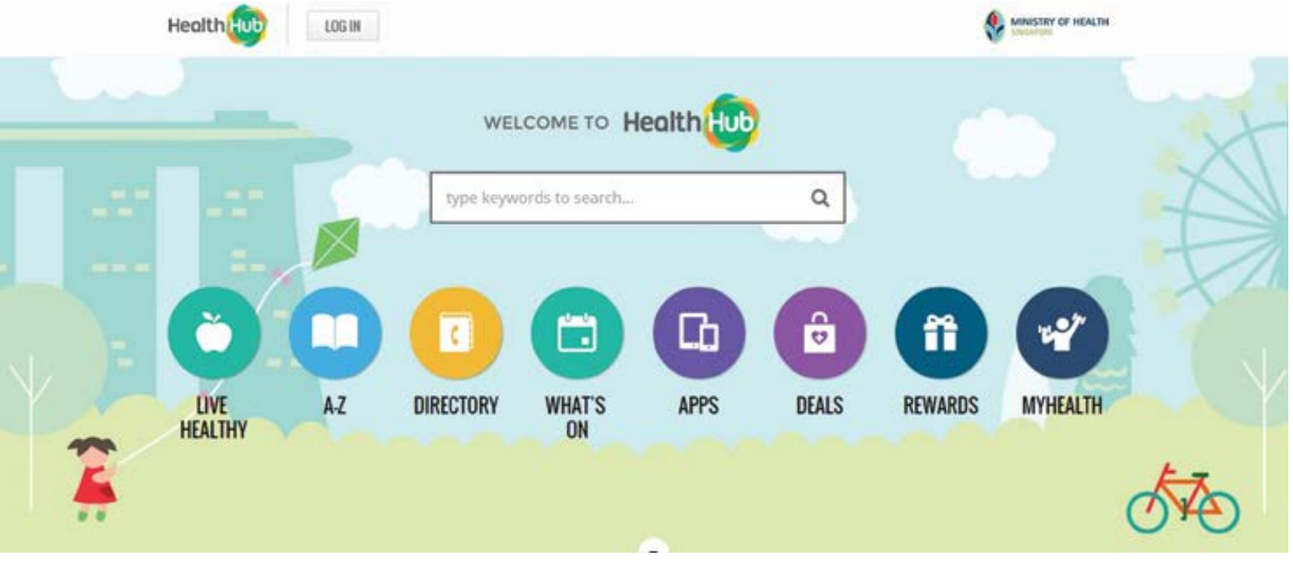
"You have the infrastructure, but you have no love, passion and warmth. That's why we need the VWOs. What we do now is to provide resources to the VWOs and fund them, and they manage the senior-care centres. As these are people doing it out of love and passion, this is the best way to deliver care. The Government will come in when required, of course."

Living longer, living healthier

A second major mindset change needs to continue in the area of healthy living. With a healthier population, we can reduce the incidence

60

Initiatives covering 12 areas such as healthcare, volunteerism, employment, housing and transport are part of the Action Plan for Successful Ageing



"HealthHub users will be able to access general health and wellness content, as well as personalised healthcare information such as medical and immunisation records."

Parliamentary Secretary for Health Muhammad Faishal Ibrahim on the upcoming HealthHub portal (above).

of chronic diseases and consequently the need for healthcare services downstream. Singaporeans will need to play their part in this journey, to take greater personal ownership over their health. But whilst individuals may be generally familiar with the need to eat healthily and exercise more, the challenge has always been how to make the behavioural changes required to achieve better health.

Such considerations led to the Healthy Living Master Plan Taskforce being set up in September 2012. It was asked to look into making healthy living accessible, natural and effortless for all Singaporeans. This whole-of-Government and whole-of-society effort was chaired by Parliamentary Secretary for Health, Associate Professor Muhammad Faishal Ibrahim, with representatives from various public agencies and the community, such as Sport Singapore, the Urban Redevelopment Authority, National Parks, the People's Association and the Land Transport Authority.

Guided by the vision of Healthy Living Every Day, Singapore in 2020 will bring healthy living to the "doorstep" of every home, workplace and school. The intention is that through scaling up and improving amenities and services, healthy living can become pervasive and a way of life. Singaporeans can move from neighbourhoods to offices and schools embracing healthy living as a part of their everyday routine. Healthier food options would be available at food courts and in restaurants, while schools provide healthier meals with more wholegrains, fruits and vegetables as well as reduce the sugar content in drinks sold on their premises.

New modes of health promotion are also being explored. According to Associate Professor Faishal, Singapore wants "to make healthy living convenient and fun through leveraging information technology".

Pointing out the high penetration of mobile devices in the country, he said: "On average, there are 1.5 phones per person in Singapore. Since mobile applications can be conveniently used to gain health knowledge and track personal health efforts, we are developing HealthHub to do just this.

"HealthHub users will be able to access general health and wellness content, as well as personalised healthcare information such as medical and immunisation records. We can access information such as hospital fees, health financing schemes and, eventually, waiting times at A&E departments."

There is also a continuation of the push towards a smoke-free society, which Associate Professor Faishal hopes will become a reality.

He said: "We introduced the I Quit campaign in 2011 which adopts a community-based yet personalised approach to build a network of support that helps smokers quit. In 2014, I Quit had 10,000 smokers signing up for the "I Quit 28-Day Countdown", a 570 percent increase from the inaugural 2011 edition. More than half of those who participated in 2014 now smoke less or have successfully quit smoking.

"Our strategies to control smoking are multi-pronged. Besides tobacco taxes, legislation and continued community support for smoking cessation, we constantly scan the world for new ideas on how we can further denormalise smoking. My hope is that we will move towards a smoke-free society eventually."

Back to the future
in primary care

When Singapore's healthcare system was still being developed in the initial years following

▲ Quit to be fit… Parliamentary Secretary for Health Faishal Ibrahim (in red shirt) and Director of Medical Services Benjamin Ong flank three men who gave up smoking at the launch of the National Tobacco Control Campaign 2014.

The future of Singapore's healthcare

Three Ministry of Health scholars share their hopes and aspirations for the future of healthcare in Singapore.

Help patients in every manner

Gayathri Dhavadas,
Senior Staff Nurse,
Tan Tock Seng Hospital

MY ROAD to nursing was a tough one. As my parents were in their 50s and my father was the sole breadwinner in my home, I had to earn money to pay my way through school, from the Institute of Technical Education (ITE) to polytechnic. During the semester, I worked part-time as a supermarket sales assistant, and during the breaks I worked 12- to 16-hour shifts at various factories. Even when Tan Tock Seng Hospital (TTSH) sponsored my studies at polytechnic, I worked to earn pocket money. I was that determined to be a nurse. So when I received the MOH scholarship to do my degree at the Alice Lee Centre for Nursing Studies in 2010, I was relieved and grateful.

Although I know this sounds clichéd, I wanted to get into nursing because it is a very noble profession. Many people still think of it as a dirty job, but it struck me that while not many people want to do the job, not many people *can* do this job. I wanted to change the negative perception people had of nursing. Now, after three years as a staff nurse at TTSH, I have worked in intensive care and high dependency units before moving to the nursing services department recently where I deal with manpower issues. I am also attached to the Communicable Diseases Centre. As a healthcare scholar, my responsibility is to give my patients the best care I can, no matter where I am. Part of that means not being afraid of making suggestions to the doctors.

Nurses are knowledgeable, but we need to be enabled and empowered with information and training as well as encouraged to speak up for our patients. This will help us in the future as patients are becoming more aware of medical conditions, thanks to the internet, and thereby more demanding. We need to help these patients take greater responsibility for their healthcare needs.

If the patients and their families learn while they are in the hospital, they will be better prepared when the patient is discharged. Then we can reduce readmission rates, cut down on caregiver stress, prevent an overload on our hospital beds and hopefully we can be more productive as nursing professionals. It is a win-win situation.

Many ways to care for patients

Muhammad Rahizan Zainuldin Ph.D,
Senior Physiotherapist, JurongHealth Services' Rehabilitation Department and Assistant Professor, Academic Programmes Division, Singapore Institute of Technology

SOMETIMES the simplest solutions are the best. Here's an example: All it took to get one of my patients, who is in his 80s, walking without an oxygen tank was a walking stick. Ah, but here's the catch… it was for his wife.

This patient suffers from a chronic lung disease and needs an oxygen tank with him at all times to assist with his breathing. When he goes to the coffeeshop to get breakfast for his wife and himself or for a walk around the neighbourhood, he has to lug around an oxygen tank that is as big as a stereo system.

Wanting to help him manage these outings without the cumbersome oxygen tank, we tried to get him to walk short distances without the tank but we felt it would be better if his wife was with him to provide support. However, as she is diabetic, she is not so steady on her feet. As they get by on help from community services, money was tight too. In this case our treatment plan had to involve the wife even though she is not our patient. Eventually we found out that she could accompany him on his walks if she had a walking stick or walking aid, which we managed to get for her.

Helping patients like this is something I enjoy. Thanks to the MOH scholarship I took up in 2000, my undergraduate studies in physiotherapy and my Ph.D thesis have prepared me to see about 16 to 18 patients a day. Most of them are elderly and, as they suffer from chronic lung issues, need exercise to improve their lung capacity.

However, as many of them have chronic conditions which need regular rehabilitative treatment, we healthcare professionals have to be mindful of their socio-economic circumstances. Now that they can use the CHAS and Pioneer Generation benefits for physiotherapy, it is a little easier for them to manage the cost of their treatment. But many of my patients still complain that transport charges are too high, making it hard for them to come to our clinic on a regular basis.

Hence, I think our profession has to move away from the traditional way of delivering care and look at how innovative technology can be vehicles of health promotion. If patients can't afford to come to the clinic or are unable to, we need to leverage on these tools and resources to treat our patients better and thereby help them live more fulfilling lives.

Build rapport with patients

Chu Shen Onn,
Pharmacist,
Tan Tock Seng Hospital

I WAS hooked on healthcare after my very first interaction with it! A one-day attachment at the National Cancer Centre in 2005 with my classmates at Hwa Chong Junior College made me realise there were many other aspects of healthcare besides medical that contribute to patient care. So, when MOH offered a scholarship for pharmacy for the first time in 2006, I applied for it without hesitation.

I've been with Tan Tock Seng Hospital (TTSH) since I graduated five years ago and I enjoy interacting with patients at the outpatient dispensary and at the clinics where I adjust the doses of their medications. Most of my patients are over the age of 60, so speaking in dialect is necessary. That is where my fluent Cantonese comes in handy. Once patients get to know you, they share their personal problems.

Building rapport and trust is crucial even for pharmacists. That said, we have to deal with unreasonable patients too. Some insist on getting medication without a doctor's prescription, which is illegal. Some make physical threats… yes, it occasionally can get dramatic in the dispensary! Some complain about the high price of certain medicines. As I spent a year seconded to MOH in the Hospital Services division, I know the amount of thought that goes into drug subsidies. That perspective helps me explain better to my patients why some drugs are subsidised and some are not. If the patient can't afford the medication, I work with the doctor to come up with solutions.

I always tell my patients that healthcare workers will help them as much as they can but within the rules.

independence, the priorities at the time were to increase access to basic healthcare and fight communicable diseases. The building of polyclinics, to tackle primary health issues, was followed by hospitals and then specialist centres to deal with more complex medical issues.

Today, patients have access to different providers across the care platforms but they do not have a relationship with a "main" healthcare provider, who could build a holistic view of their medical conditions.

With the prevalence of lifestyle- and age-related chronic illness, MOH's vision is one in which patients receive good long-term and multi-dimensional care, anchored in a relationship between a family doctor and the patient. With over 80 percent of primary care delivered by some 2,000 private general practitioners (GPs) either operating solo or in small groups, it is evident that most Singaporeans will need their own family GP to consult on their healthcare needs. This GP will also be able to guide them, when required, to specialist care in the major hospitals.

Minister of State for Health Dr Lam Pin Min feels there is more room for collaboration in this area. Acknowledging the need to ramp up infrastructure development in this sector – polyclinics, hospitals, community hospitals and nursing homes – he says MOH will meet the demands either by modernising and expanding existing facilities or building new ones.

In an interview for this book, he said: "There is also impetus to continually transform the primary care

▼ Keeping a close watch… Minister of State for Health Dr Lam Pin Min (below, at a mobile eye clinic for senior citizens) feels the public and private sectors can work together to offer better primary care.

▲ Punggol to get a polyclinic… by 2017, Punggol Polyclinic will open in neighbourhood centre Oasis Terraces (artist's impression above).

landscape to one of more integration and collaboration between the public and private sectors, as well as between the primary care sectors and specialist care within the Regional Health System (RHS). Primary care doctors, both public and private, need to be integrated as part of a national healthcare system with aligned goals."

This was a view echoed by Dr Lee Suan Yew, a GP who has served as an examiner for both the Diplomate College of Family Physicians and the Masters of Family Medicine at the National University of Singapore and as the President of the College of Family Physicians from 1985 to 1988. He welcomes the plan to bring private primary care doctors into a collaborative relationship with the RHS and said: "We have good family physicians here. Family medicine is cost-effective medicine. An early diagnosis by a trusted family physician can help a patient save a lot of money."

Going forward, the challenge is thus twofold. The first is for MOH to learn, guided by the vision of "One Family, One Family Physician", from earlier efforts to introduce Family Medicine Centres and Community Health Centres introduced under Healthcare 2020, to identify best practices and scale up successful models. New strategies and incentives, including further enhancement to the Community Health Assist Scheme (CHAS), could be considered to help strengthen the relationship between patients and their family physicians. The second is to build up the partnership between GPs and the RHS, through professional and clinical collaboration, enabled by the National Electronic Health Record (NEHR) platform.

Our polyclinics must also continue to innovate to provide better care for the patients in their region. Two new polyclinics, Pioneer Family Healthcare Centre managed by the National Healthcare Group Polyclinics (NHGP) and Punggol Polyclinic managed by SingHealth Polyclinics, are scheduled to start operations in 2017. They aim to help the respective communities in which they are located with disease management and by providing holistic care as well as health education.

Punggol Polyclinic will be located next to the Oasis Light Rail Transit station and be part of the neighbourhood centre Oasis Terraces. The polyclinic will work closely with Sengkang Health which will manage the upcoming Sengkang General Hospital and the Sengkang Community Hospital. Besides the usual polyclinic amenities, Punggol Polyclinic will provide services for women and children as well as physiotherapy and podiatry. It will also provide training for family physicians.

Pioneer Family Healthcare Centre, NHGP's 10th polyclinic, will serve the growing community in the Jurong West area. Located close to the Pioneer MRT station, there are plans to create specific healthcare teams for patients so they can develop strong relationships with their medical and allied health professionals.

Dr David Tan, Deputy Head of Jurong Polyclinic and Head-Designate of Pioneer Family Healthcare Centre, said: "Our care teams will take into account knowledge of patients' medical and psychosocial background to better engage them around their care plans. With the benefit of stronger relationships between patients and their care teams, there can be more effective disease prevention, health promotion and patient empowerment.".

One healthcare

In addition to engaging the GPs more, Health Minister Gan hopes that the private sector would also play an important and continuing role in Singapore's healthcare landscape.

"Going forward, I think we cannot afford to have two distinct systems. The objective is to first develop a working relationship with the private sector. Later on, if we need to do bigger things, you have the level of comfort that you know them.

▲ Ah ma, we show you how… the private and people sector can play a big role in caring for Singapore's ageing population (above, children working with senior citizens on art activities at Tembusu Rehab and Day Care Centre).

Eric Li, MOH Holdings scholar and physiotherapy undergraduate at the University of Queensland

More technology, better healthcare

I MAY not be a physiotherapist yet, but I can already see how much technology will impact the way we deliver healthcare to our patients in the future. For instance, some American clinics use 3D cameras to capture patients' movements. It looks like they are making a CGI movie with patients, with markers on their bodies to capture their movements, filmed in front of a green screen. Therapists and doctors use these images to biomechanically correct the patients' movements.

Even a simple mobile phone camera can do the job for us in less clinical rehabilitation settings. I have used my mobile phone to see where I am going wrong in my taekwondo training. All you need to do is take a video of your movements from various angles and you can see what needs to be improved. With the ever-increasing quality of mobile phone cameras, a video from different angles will help us diagnose patients' movement issues and correct it.

There is also a whole field of development in this direction using gaming technology. Some of the games on Nintendo Wii or Microsoft's Kinect for Xbox are useful to help patients with their balance. Patients can get their own gaming equipment to do their training at home and the data from that training can be uploaded to a physiotherapist. Not only can this be a more enjoyable mode of therapy for patients, it also trims the number of visits to the clinic or hospital.

There are a number of companies in Asia and the United States that are already exploring the use of a gaming platform in healthcare. For instance, in the therapy that aids the recovery of stroke patients. As a physiotherapist in the making, I find such developments exciting. The rehabilitation process can sometimes be hard on patients, especially if the progress is slow. If these tech companies find a way to combine entertainment and rehabilitation on a user-friendly platform, there will be an added incentive for patients to do their part in their rehabilitation.

Another area I am excited about is health technology and fitness fashion, like the smart shirt which I recently read about online. It acts as a heart rate monitor, calorie counter and a fitness tracker all in one, while you are wearing it. That is pretty cool. I would buy that shirt if the price was affordable.

If you can wear your technology, it negates the need to have many items strapped onto you. Right now, many of us use health/fitness equipment like heart rate monitors, blood pressure monitors and calorie counters which are quite useful. However, some of them can be bulky and hinder proper movement especially if you are running.

I see healthcare technology getting smaller, better and faster. This makes it valuable for healthcare professionals. The faster you get the information from patients, and if this information is processed by computers, you will know exactly what to do next.

A physiotherapist wants to guide patients as they move along the rehabilitation process, and not just over a one- or two-week period. If the technology helps to monitor the patients' progress at home, even better.

The patient of the future is going to be a tech-savvy one. He or she would have grown up using mobile phones, applications and other kinds of health technology. This means I will have to be on my toes, technically speaking. But if it allows me to deliver better care to my patients, why not?

Since 2010, MOH Holdings took over the administration of healthcare scholarships funded by the Ministry of Health and the healthcare clusters.

▼ Tech think... healthcare scholar and taekwondo buff Eric Li uses fitness apps and technology for work and play.

So it's an important first step. We don't have a very big private sector, we just have two or three (private hospital) operators, so it is not impossible to find a way to work with them," he said.

Similarly, even as the VWO-run nursing home and elderly care facilities innovate on new care models, they will need to develop partnerships with the RHS.

Long established VWOs who have been serving the community for over a century are keen to work with the RHS to provide more efficient care for Singaporeans. One such example is the St. Andrew's Community Hospital (SACH), the community service arm of the St Andrew's Mission Hospital, that is in a successful partnership with Changi General Hospital, The Salvation Army Peacehaven Nursing Home, SingHealth Polyclinics and the Health Promotion Board under the Eastern Health Alliance. SACH's Group CEO Dr Arthur Chern said in an interview for this book that the alliance was a natural progression from the established "network of relationships" between the institutions.

"Every one of its members will continue to have its own distinct identity, only that they have signed on to have a common goal for patients and work together. So that is forward thinking and something that helps all of us. And even now we are pushing many new firsts, like the integrated building which would probably be the first time one hospital building has two hospitals sharing the facilities," he added.

Likewise, Kwong Wai Shiu Hospital (KWSH) collaborates with Tan Tock Seng Hospital (TTSH) in its community health programmes. KWSH's CEO Dr Ow Chee Chung said in an interview for this book that, with the challenges facing Singapore, there is a need to have both regional health systems and community care models. "I think we will need to have a few models of care, there is no one solution," he added.

Mt Alvernia Hospital hopes to kickstart its own community collaborations with TTSH.

Mr Lee Suen Ming, CEO of Mt Alvernia Hospital, said in an interview for this book: "As we look at the elderly population, we thought it would be perfect for us to link up with a hospital like TTSH

► Advanced care… getting one Advanced Practice Nurse (right) to see patients, instead of a doctor and a nurse, in a home care programme is one example of how there can be better deployment of the healthcare workforce.

which is so focused on community work, providing the healing and caring in the community."

Dr Mohd Hasbi Abu Bakar, president of the Muslim Missionary Society Singapore (Jamiyah), said that his organisation has always received Government support – not just in monetary terms – for its initiatives like the nursing home it set up in 2002.

He is confident that relationship will continue in the future: "We believe that this tripartite relationship – Jamiyah, the Government and the community – will only strengthen. This can help all of us find innovative solutions to deal with future challenges."

People – our critical resource

The heart of healthcare is its people. MOH is putting in place a raft of plans to manage and train our most precious resource, manpower. From the professionals to the support staff, they will all be given the opportunity to become future-ready to meet the challenges of a changing healthcare eco-system.

By 2020, over 20,000 new employees will be required to run Singapore's new healthcare facilities. About half of that number will be needed for the Intermediate to Long-Term Care Services (ILTC) for health and aged care services.

Healthcare providers and MOH are also finding ways to enhance salaries, including in the ILTC sector, as well as implement flexible employment options. In an era where all healthcare workers – whether doctor, nurse or allied healthcare professional – are highly trained experts in their own field, the Ministry is also working with healthcare providers to help their professionals operate at the "top of their licence".

The aim is to optimise better deployment of the workforce. For example, in a home care programme, there could be one Advanced Practice Nurse (APN) to see patients instead of a doctor and a nurse. This will moderate manpower costs, reduce fragmentation of care and allow doctors to focus on more serious cases.

Clinical support staff across the healthcare clusters will also be given opportunities to have their job scopes enhanced, enjoy more upgrading opportunities and better career progression. And in keeping with the action plan for active ageing, the Ministry will also work on retaining older healthcare workers in addition to improving productivity.

MOH, in line with the Healthcare Productivity Roadmap, plans to improve productivity in the acute and ILTC sectors of public healthcare, with a focus on providers adopting new technology, IT-enablement and process and job re-design.

Mrs Tan Ching Yee, Permanent Secretary at MOH, said: "The healthcare system is a complex network of many parts. How we wisely organise our healthcare delivery system, to give our people every motivation to do their best work in caring for the health of our population, and how we prudently manage financing are key to achieving good health outcomes in a sustainable way.

"We face constraints in manpower supply across all sectors, not just in healthcare. With an ageing population, there will be a shrinking supply of workers joining us to help care for our fellow citizens. It means keener competition for talent.

"Transforming care models to allow our professionals to practise at the top of their licences and take on additional responsibilities are necessary to optimise the expertise of our staff. Innovation in delivery of care will also be important in moving healthcare forward into

▲ Age is no barrier… in keeping with the Action Plan for Active Ageing (above, a perfect example is retired primary school teacher David Ng who picked up inline skating at age 59 and went on to become an inline skating instructor), MOH will work on enhancing its most precious resource: Manpower.

Madam Nor Ain Saleha Binte Abdul Hamid, Health Promotion Board ambassador

Retired from work, not from life

I CHOSE to retire in 2011, as my children had grown up and we were financially stable. But that didn't mean I was going to retire from life. After all, after having cared for my family ever since I got married, I felt the time was right to do things for me. That's why I signed up to be a Health Ambassador with the Health Promotion Board (HPB) that same year.

Health is one of my passions and I believe in ageing well. It could be the effect of a 38-year career with the Singapore Sports Council (now Sport Singapore). The workplace and the work we did encouraged me to be as active as possible. I still make time for an hour-long brisk walk around Bedok Reservoir every day.

I was very impressed with the systematic training by HPB. They taught us new Health Ambassadors about a healthy lifestyle, good nutrition, regular health screenings and how to manage running the various events organised by them. For instance, I volunteered at a smoking cessation event where we registered smokers for the I Quit programme.

The best part of being a Health Ambassador is the friends I have made during the work we do. Most of them are my age, with similar mindsets and keen to pursue their passions. In fact, we keep in touch via the Health Ambassador Network, or HAN as we call it. We have several WhatsApp groups where my fellow volunteers and I communicate and help one another with projects.

The work we do is exciting too. We help HPB conduct an exercise programme for seniors and I join the workout as well. Through the HAN, I found out that two ladies were keen to learn how to cook Malay dishes so we set up a group called Cook and Craft in 2012. As I encourage people in my neighbourhood to keep active, I asked an 80-year-old woman to teach the group how to cook Malay cuisine, the healthy way of course. Eventually we invited more people, both locals and foreigners, to join the group. It is a wonderful opportunity for all of us to celebrate one another's festivals and learn about each other's cultures.

Through HPB, I also found out about Family Central where they conduct the Intergenerational Learning Programme which has a course titled I'm A Senior and I'm Loving It. It uses workshops to teach the elderly how to age well by being active and showing us how to keep healthy and mentally motivated. Family Central also has other workshops that we can participate in, for instance we were taught how to play the drums by students from National Junior College. I also attended an IT programme where Punggol Secondary School students taught us how to navigate the internet.

It's not just about how I benefit, I also make an effort to give back. I volunteer once a week at the Pioneer Generation Office (PGO) in Tampines, where they need more Malay volunteers to help explain the Pioneer Generation Package to the pioneers in the area. When we conduct home visits, we sometimes find out that these older folks have other issues as well. That's when the PGO can alert the social services agencies. I think it is important we go to the ground and find out what the problems are, especially among the elderly.

As if my calendar is not packed enough, I am also the neighbourhood nenek (grandmother). My neighbours' children and grandchildren spend time with me in my home. I read to them often, and occasionally take them to the library or the playground. I even hosted a cooking workshop for the older ones – they were very excited to learn how to make grilled salmon – and took them to watch the athletics finals at the recent SEA Games.

My retired life is not just about volunteering and engaging society. I also fulfil my role as a daughter, wife and mother.

Once a week, I take my 83-year-old mother out to spend time with her. My HPB training has taught me that such outings are good for her emotional and mental well-being. I also ensure I cook and spend time with my husband, son and daughter and support them in their lives. Thankfully, all three of them are very supportive of my work as a Health Ambassador.

As you can see, I am busy every day of the week... which is how I like it. Being a senior citizen in this country is a privilege. There are so many activities for us to participate in and most of them are free. This is the biggest blessing in my life. After working so hard for so many years, I feel lucky to be able to choose what I want to do with my time. That I can do it while remaining healthy, active and of some service to the community is a bonus.

► Fit and fun... Madam Nor Ain participating in her company's sports day in the 1980s.

the future so that we can continue to deliver a high quality of care with a fulfilled and happy workforce.

"Our approach towards transformation is to take a few purposeful steps in the desired direction, learn from our experience and then adjust our plans for the next move."

Becoming a Smart Nation

One patient, one health record

Technology will continue to play an important role to support healthcare transformation efforts in multiple ways. This is part of Singapore's Smart Nation journey with public healthcare institutions working to deliver more efficient and productive services, making healthcare better, cheaper and faster while ensuring that the critical element of caring for patients is preserved and enhanced.

At an institutional level, technology can link healthcare providers on a common platform to look after their patient better with timely information. The National Electronic Health Record – its aim is to have "One Patient, One Health Record" – has already launched across the public healthcare clusters, while the Community Hospital Common System (CHCS) will be launched in the latter half of 2015 to allow better integration of patient care across acute and community hospitals.

The six healthcare clusters are also test-bedding and pioneering new initiatives that ride on technology. For example, at Khoo Teck Puat Hospital (KTPH), in a bid to pre-empt potential medical problems and avoid readmission of high-risk patients, nurses are equipped with PDAs (Personal Digital Assistant) that enable them to access their patients' profiles and medical history while visiting them at their homes. The National University Hospital's Outpatient Telehealth Initiative (OTI) uses bluetooth-enabled devices to monitor patients' conditions, and generate alerts based on threshold breaches in vital sign readings.

Changi General Hospital (CGH) recently opened its Centre for Healthcare Assistive and Robotics Technology (Chart) which is part of the National Robotics Programme. This is a collaborative platform, reported to be the first of its kind in Singapore, that will help healthcare professionals

Leg up for medical technology… President Tony Tan Keng Yam watches a demonstration of the Leg Rehabilitation Robot during the opening of the Centre for Healthcare Assistive and Robotics Technology at Changi General Hospital in July 2015.

work with partners from the industry, academia and the research sector to develop solutions in five key areas using robotics and assistive technologies. The areas are: Developing virtual hospitals, transforming aged care, optimising rehabilitation, automating processes and enhancing medical training.

To help overcome the manpower crunch, CGH is piloting a delivery robot called HOSPI. The first hospital outside Japan to utilise this robot, CGH has four HOSPIs moving around its premises to deliver fragile and bulky medicine, medical specimens and patients' case notes as part of its porter management system. The robots are equipped with sensor-aided guidance systems and anti-theft, anti-tampering security features.

The hospital will also run trials on a special blood-sensitive bandage designed by the Singapore University of Technology and Design which can tell blood from other fluids, and will set off an alarm if it senses just one millilitre of blood.

On an individual level, with nine out of 10 Singapore homes having broadband and one of the highest smartphone penetrations in the world (85 percent of Singapore residents own smartphones), personal health technology will also be leveraged as part of a future-ready healthcare system.

Dr Khor believes that wearable healthcare technology can help the older generation monitor their vital signs.

"HDB is also talking about smart homes that have these features. For instance, we are piloting some of these in Marine Parade. Technology is there, but how do you make use of it? It's not only about detecting; someone must be able to respond – the caregiver, next-of-kin or neighbours. You need to have the whole structure in place. There are also programmes in Whampoa, Bedok and some other constituencies. We have recruited people, both young and old, to look after the very old. It's really about making the best of what we have," she said.

Director of Medical Services, Associate Professor Benjamin Ong, added: "The most important thing is to deliver the right kind of care. Not every kind of healthcare has to be high-tech or high-end. Yes, there is room for that, and we should do it if necessary. At the same time, the individual has a part to play, in doing simple things such as eating healthily, exercising and taking medication. What we are really interested in is to ascertain where interventions are most effective, and to provide care where necessary."

To better determine care appropriateness, MOH has set up a new agency to look into developing clinical practices and technical guidelines for health technologies. This will help both patients and doctors define what is appropriate care and let them make better choices.

Push for clinical research

In 2006, MOH established a mandate to support translational and clinical research to discover better ways to advance healthcare and enhance existing practices, leading to better treatment for patients. With the establishment of the National Medical Research Council (NMRC) in 1994, there has been a great push forward in clinical research. In 2011, a $590-million fund was created to boost Singapore's biomedical industry.

To dovetail with MOH's Healthcare 2020 Masterplan, the Healthcare Research Strategy 2020 – it is part of the national five-year Research, Innovation and Enterprise 2020 Masterplan - has identified five strategic research areas for translational and clinical research. The aim is for the clinical research community to focus on priority disease areas such as cardiovascular issues, neurological and sense disorders, infectious diseases, diabetes and other metabolic and endocrine conditions as well as cancer. There will also be a push for research in ageing, under the Ageing National Innovation Challenge, in three key areas: Lengthening health span with life span increase, productive longevity and ageing in place.

While the conversation about biomedical research's impact on creating new jobs and its possible economic returns will continue into the next five years, research will go more downstream to the area of health services research. Here, the emphasis is on improving the delivery of health services and evaluating existing ones for clinical and cost effectiveness especially with the growing demand for healthcare and the ageing population.

Talent development will continue to be part of NMRC's push to have a cadre of skilled clinician-scientists through competitive research grants, awards and development programmes, with a focus to develop capabilities in MOH's strategic disease areas as well as develop the skills of clinical research support teams. NMRC will provide support to enablers such as the Singapore Clinical Research Institute and the Investigational Medicines Units.

In an interview for this book, Associate Professor Yeoh Khay Guan, Deputy Chief Executive of the National University Health System and Dean of the Yong Loo Lin School of Medicine at the National University of Singapore, said that being a clinician-scientist makes him a better physician and a better scientist: "A clinician-scientist combines the expertise of a physician with the skills of a scientist, and is ideally equipped to do the research to find better solutions for tomorrow. This is the new job for the 21st century, to find innovative solutions to today's health problems. It is an exciting time to be working in medicine and in health sciences."

IT's the way forward… the National Health IT Summit 2015 saw (from left) Director of Medical Services Benjamin Ong, Permanent Secretary (Health) Tan Ching Yee, Second Permanent Secretary (Health) MG (NS) Ng Chee Khern and MOH's Chief Information Officer Bruce Liang discuss how to improve healthcare with the use of information technology.

Role as a global city

Singapore, as a global citizen, will need to continue playing a responsible role in the international effort to guard against international disease outbreaks and to provide humanitarian assistance when natural disasters strike in

Excuse me, HOSPI coming through

There's a new addition to the corridors of Changi General Hospital: As of February 2015, four HOSPI robots have been delivering medication, blood specimens and documents throughout the hospital. How does it know where it's going? It navigates via the hospital's map data built into its memory. How does it avoid bumping into people and objects? It is equipped with sensors to avoid obstacles and even says "Excuse me" when it senses something in its path. How does the hospital keep track of HOSPI? The robot relays its location to the control centre which keeps track of its progress.

Richard Tay, kidney patient of over 32 years

54 years as a patient, 32 of them on dialysis

I WAS born with a blocked bladder. At the age of 10 months I was admitted to hospital... and stayed there till I was about six years old. So, when I tell people that the hospital was my first home, I am not joking! In fact, I spent so much time in hospital as a child that I learnt English from the nurses at the Singapore General Hospital's paediatric wing.

The doctors operated on me to fix the problem but it didn't go so well and left me with little control over my bladder. When I was seven years old, I used to take an extra pair of pants with me to school. Even so, my classmates would tease me because of the smell. I would take antibiotics to prevent urinary tract infection and even tried traditional Chinese medicine. Eventually my kidney became infected because of the urine flow-back.

At 19, when I was studying electrical engineering at Singapore Polytechnic, I experienced chest pains and was admitted to hospital again. The doctors put me on peritoneal dialysis and told me I had to go on dialysis permanently. I refused. As a young man, I could not accept what my body was doing to me. After three months in the hospital, afraid I would miss my final-year examinations, I discharged myself nine days before the exams and sat for all five papers.

I passed four, but collapsed after my examinations.

The doctor told me off for putting my life in danger and put me on Continuous Ambulatory Peritoneal Dialysis (CAPD) where a liquid called dialysate flows into the stomach through a catheter to remove the waste material, chemicals and extra fluid from the body. From 1980 to 1985 I was on CAPD, which I had to do every four hours. It was a terrible time as I could not find work that would fit the dialysis schedule.

Luckily I have 11 siblings and all of them supported me. But I felt really bad about imposing on them. I desperately wanted to be independent, so I became a private tutor as the schedule could accommodate the dialysis sessions. In 1985, when I was in my 20s, an episode of peritonitis (inflammation of the abdomen lining) ended my stint with CAPD and forced me to go on haemodialysis.

This happened to be when the National Kidney Foundation (NKF) was introducing self-dialysis at its centres. Although it was called that, patients needed help to set the whole thing up, from preparing the equipment to inserting the needle into their fistula (surgically created connection of an artery to a vein in the arm), which meant their family members had to help them. I told my doctor I wanted to do it all myself and, within two months, I trained myself by learning how to insert the needle into my fistula and how to work the dialysis machine. I was a considered a pioneer at that time, the first patient to do self-dialysis without much help.

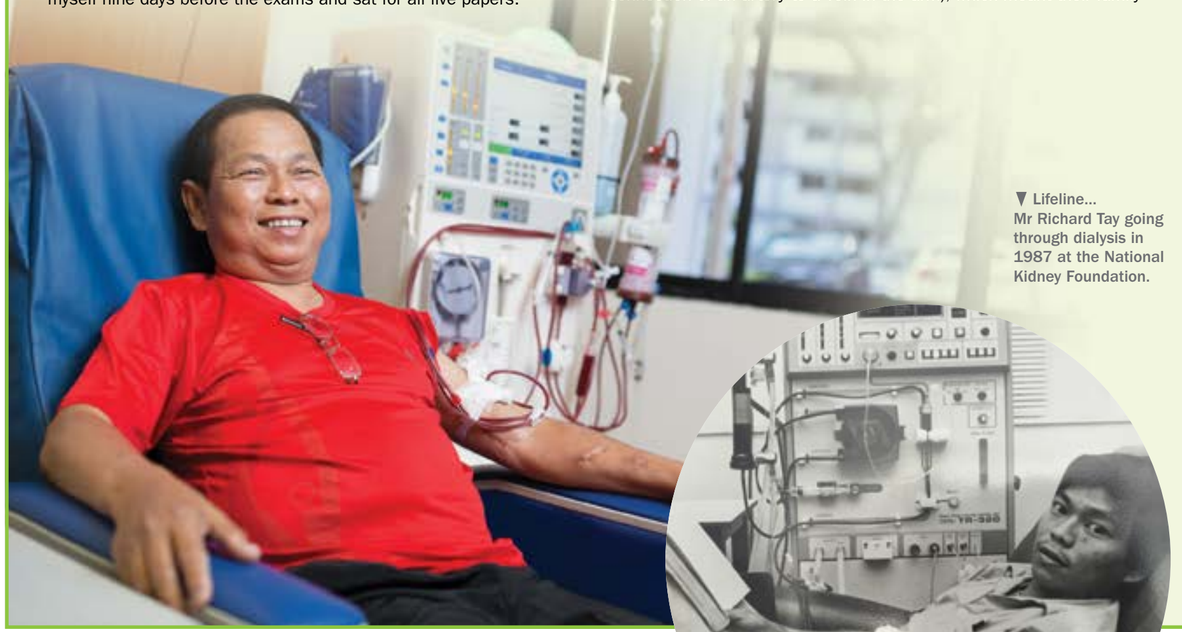
I was insistent on doing things on my own. I didn't want to impose on anybody. I also wanted to be treated like a normal person, not a sick patient. I didn't like being a parasite, asking my brothers and sisters for money and support. I had to face this problem and face it strongly.

I started self-dialysis in 1985 at Kwong Wai Shiu Hospital. In 1987, I moved to Toa Payoh when the NKF satellite centre opened. During that time, I also helped my brother set up a medical equipment firm where I am now director of sales. Now at 54, having survived 32 years as a kidney patient, I am amazed at how far medical progress has taken dialysis treatments.

In the early 1980s we had to go to the hospital for dialysis which took 15 to 16 hours a day. Now it's just four hours at a centre close to you. I think there are more than 50 dialysis centres, by NKF and private companies, in Singapore. I recall asking my doctor how long I had to live when I was 19. I was told 10 to 20 years.

I don't ask anymore. I make use of my time wisely. Since I have to be on dialysis three times a week, for four hours each time, I use that time to read sales reports or learn more about new medical products. My brother and I have expanded our company into Malaysia and Thailand and I am able to make short business trips overseas and come back to Singapore for dialysis.

I am grateful for the excellent medical care I have received. I am good friends with my renal doctors. But I am also proud of myself for becoming independent. Not only do I manage my dialysis with minimal help, I also monitor my potassium and blood readings very carefully. I may not have got married because I do not want to burden my spouse with my problems, but I also don't have time for self-pity. Once you lose the mental battle, you go fast.



▼ Lifeline... Mr Richard Tay going through dialysis in 1987 at the National Kidney Foundation.

the region. In 2015, MOH sent two of its staff members to support the World Health Organisation (WHO) in its fight against Ebola – one to the WHO headquarters in Geneva and another to the WHO Western Pacific Regional Office Ebola Support Team to support the overall Ebola response in Sierra Leone. Healthcare workers also went to Nepal as part of Singapore's humanitarian response following the magnitude 7.8 earthquake on 25 April 2015.

At the same time, as a globally inter-connected city, Singapore will have to be on perpetual guard against communicable diseases. Neither Singaporeans nor our healthcare providers can easily forget our experience with SARS in 2003 and will always need to be prepared to deal with new and evolving issues and potential pandemics.

Professor Leo Yee Sin, who heads TTSH's Institute of Infectious Diseases and Epidemiology and is the Clinical Director of Singapore's Communicable Disease Centre, has highlighted that infectious diseases respect no boundaries. She feels that while Singapore has developed good regional and international connectivity, we still need to further strengthen our internal connectivity.

"Post-SARS, we still look at infectious disease as a hospital issue but that is not the case. It has to be integrated connections, vertically and horizontally between healthcare providers – hospitals, step-down care facilities and research institutions as well as individuals," she said.

Prof Leo added that individuals can play a significant role in this fight, simply by taking personal responsibility for their health and hygiene.

The journey of transformation

Coming full circle

As in all journeys of transformation, the key issue is how to change hearts and minds. Back in the early days of Singapore's independence, healthcare workers went into the slums, kampongs and islands of the fledgling nation to deliver healthcare to the people and explain to them how to better take care of themselves and their families.

Today, the need to reach out and connect

► Staying healthy and young at heart… a group of seniors performing a youthful and vibrant dance routine during the launch of HPB's Senior Health Ambassador Programme.

with citizens remains as strong as ever. HPB's Healthcare Ambassadors are active in explaining to Singaporeans how to better take care of their health and even nag their neighbours to go for health screenings and then the follow-up appointments.

However, beyond the health promotion initiative, Singaporeans will need to become educated consumers of healthcare. They must be able to better discern the effectiveness and appropriateness of a course of treatment prescribed for them, rather than pursue the newest, most high-end and inevitably the most costly option available. We will need to make informed decisions on healthcare insurance, so that we purchase the plan – Integrated Shield Plan or ElderShield plan – which meets our needs and the size of our wallets.

We will have to be able to appreciate what different healthcare providers bring to the table, and work with our family doctor as our partner and guide for our healthcare journey. And, last but not least, we must be willing to have difficult conversations about end-of-life issues, to better understand when medical intervention can be effective or when care should be aimed at comforting and easing the patient in their final stages.

Going forward, healthcare workers must again venture forth, from behind the hospital or institutional walls, to bring knowledge and expertise, care and compassion to their fellow Singaporeans.

Investing in healthcare now for the future

The first 50 years of Singapore's public healthcare journey have been extraordinary and, as we stand poised on the next phase of growth, we aspire for even better things to come.

When asked for his wish for healthcare in Singapore, Minister for Health Gan quoted a Chinese saying 养生之道 – this means nurturing the habits of maintaining good health and leading good lives. He would like to see all Singaporeans treasuring their health by adopting healthy living habits and creating a harmonious society.

"They always say when you're young, you spend your health in order to accumulate wealth. When you grow old, you tend to spend your wealth to keep your health. So, it is far better to invest in health because that is more enduring. That is the greatest dividend that you can receive… don't opt out of that investment," he added.

Like his fellow Singaporeans, Mr Gan can take heart in the knowledge that Singapore's healthcare ecosystem is built on strong foundations. It is well planned and capable of handling the challenges of the next 50 years. And, for that, we owe a deep debt of gratitude to the pioneers from our healthcare institutions and across the public sector who worked tirelessly to build a world-class healthcare system for Singapore.

As we move on from SG50 and cast our eyes towards SG100, the message is clear: Every one of us has a part to play in ensuring Singapore of 2065 is a healthy, happy nation. Our citizens must take personal responsibility and lead lives that are healthy and fulfilling. Our healthcare workers and policy-makers must continue to transform our healthcare system for the better and champion a healthy nation. If all of us do our part, we can look forward to living long, living well, and with peace of mind.

◄ A Minister's wish for Singapore… not only did Mr Gan quote a Chinese saying (养生之道, which means nurturing the habits of maintaining good health and leading good lives), he even displayed his penchant for calligraphy just for this book.

2015 and beyond

Ministry of Health

Vision

Championing a healthy nation with our people —
To live well, live long & with peace of mind

Mission

Our mission is to promote good health and reduce illness, ensure access to good and affordable healthcare, and pursue medical excellence. We achieve this through three strategies:

- **Promote good health and reduce illness**
  Good health is to a great extent the responsibility of the individual. But the Ministry plays a major role in educating and providing information to the public on how they can maintain a healthy lifestyle. The Ministry also plays a key role in reducing illnesses in Singapore through the control and prevention of diseases and ensuring that resources are allocated appropriately to do this.

- **Ensure access to good and affordable healthcare**
  The Ministry is responsible for ensuring that healthcare in Singapore is characterised by good clinical outcomes and professional standards, and that services delivered are appropriate to each patient's needs. While we emphasise the principle of co-payment, we also ensure that healthcare remains affordable to Singaporeans.

- **Pursue medical excellence**
  Our healthcare system is well regarded and Singaporeans have benefited from it. Increasing numbers of foreign patients seek treatment in Singapore. We will build on this so that we become even better known for certain areas in healthcare. In the process, we must make sure that healthcare costs continue to remain affordable to Singaporeans.

Values

The following signifies the core values that the Ministry embodies through our staff:

- Dedication
- Excellence
- Professionalism
- Integrity
- Care & Compassion
- Teamwork

Key Appointments

MINISTER FOR HEALTH

Mr Ahmad Bin Ibrahim	1959 – 1961	Dr Richard Hu Tsu Tau	1985 – 1986
Mr Kenneth Michael Byrne	1961 – 1963	Mr Yeo Cheow Tong	1987 – 1994
Mr Yong Nyuk Lin	1963 – 1968	BG George Yeo Yong Boon	1994 – 1997
Mr Chua Sian Chin	1968 – 1975	Mr Yeo Cheow Tong	1997 – 1999
Dr Toh Chin Chye	1975 – 1981	Mr Lim Hng Kiang	1999 – 2003
Mr Goh Chok Tong	1981 – 1984	Mr Khaw Boon Wan	2003 – 2011
Mr Howe Yoon Chong	1982 – 1985	Mr Gan Kim Yong	2011 – present
Dr Tony Tan Keng Yam	1985 – 1985		

SENIOR MINISTER OF STATE FOR HEALTH

Dr Aline Wong 1995 – 1999 | Dr Balaji Sadasivan 2004 – 2006 | Dr Amy Khor 2013 – present

MINISTER OF STATE FOR HEALTH

Dr Ang Kok Peng	1974 – 1975	Mr Heng Chee How	2006 – 2008
Mr Yeo Cheow Tong	1985 – 1986	Dr Amy Khor	2011 – 2013
Dr Aline Wong	1990 – 1995	Dr Lam Pin Min	2014 – present
Dr Balaji Sadasivan	2001 – 2004		

SENIOR PARLIAMENTARY SECRETARY FOR HEALTH

Mr Chan Soo Sen	2001 – 2001	Mr Hawazi Daipi	2008 – 2011

PARLIAMENTARY SECRETARY FOR HEALTH

Dr Sheng Nam Chin	1959 – 1961	Mr Wan Hussin Zoohri	1981 – 1984
Mr Buang Bin Omar Junid	1961 – 1963	Mr Chan Soo Sen	1999 – 2001
Mr Sia Kah Hui	1963 – 1967	Dr Mohamad Maliki Bin Osman	2004 – 2005
Mr Chor Yeok Eng	1966 – 1972	A/Prof Muhammad Faishal Ibrahim	2012 – present

PERMANENT SECRETARY (HEALTH)

Dr M. Doraisingham	1957 – 1959	Dr Kwa Soon Bee	1984 – 1996
Dr R. Calderwood	1959 – 1959	Mr Koh Yong Guan	1996 – 1999
Dr Colin Marcus	1959 – 1960	Mr Moses Lee	1997 – 2005*
Dr Ng See Yook	1960 – 1966	Ms Yong Ying-I	2005 – 2012
Dr Ho Guan Lim	1966 – 1977	Mrs Tan Ching Yee	2012 – present
Dr Andrew Chew Guan Khuan	1977 – 1984	MG (NS) Ng Chee Khern	2014 – present*

*Mr Lee was 2nd Permanent Secretary from 1997 to 1999; MG (NS) Ng is 2nd Permanent Secretary

DIRECTOR OF MEDICAL SERVICES

Dr M. Doraisingham	1957 – 1959	Dr Kwa Soon Bee	1984 – 1996
Dr R. Calderwood	1959 – 1959	Dr Chen Ai Ju	1996 – 2000
Dr Colin Marcus	1959 – 1960	Prof Tan Chorh Chuan	2000 – 2004
Dr Ng See Yook	1960 – 1966	Prof Satkunanantham Kandiah	2004 – 2013
Dr Ho Guan Lim	1966 – 1977	A/Prof Benjamin Ong	2014 – present
Dr Andrew Chew Guan Khuan	1977 – 1984		

Acknowledgements

The editorial team wishes to express its sincere gratitude to the following people and institutions for their support.

ADVISORS

A/Prof John Lim
Ms Elizabeth Quah

SPECIAL ADVISORS

Prof Chee Yam Cheng
A/Prof Shanta C. Emmanuel
Mr Goh Aik Guan
Prof Goh Kee Tai
Dr Jennifer Lee
Mrs Tan Ching Yee
Prof Tan Ser Kiat

INTERVIEWEES

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Ms Yong Ying-I
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PHOTOS/RESEARCH

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Kwong Wai Shiu Hospital
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Prof Lee Kip Lin
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Tan Tock Seng Hospital
Tan Tock Seng Hospital Heritage Museum
Dr Tay Teck Eng
Tembusu Rehab and Day Care Centre
The Istana
The National Archives, United Kingdom
The SGH Museum
Urban Redevelopment Authority
Villa Francis Home for the Aged

EDITORIAL TEAM (MOHH CCD)

Editor
Pradeep Paul

Writers
Tong Yoke Tho, Sheela Narayanan

Researchers
Lincoln Sim, Lim Puay Keng, Clareen Goh,
Nuridah Abdul Rahman, Lum Wen Qing,
Jeslyn Goh, Desiree Lee, Shery Zhan, Janice Ee

Coordinator
Tan San San

Designer
Edmund Goh

With help from MOH CCD
Stephanie Lim and Chiu Mei Ji
(infographics on page 221)

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