Singapore: a primary health care case study in the context of the COVID-19 pandemic

Kai Hong Phua
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Executive summary

This case study examines primary health care (PHC) in Singapore to inform future policy and practice, incorporating lessons learned during the COVID-19 pandemic between January 2020 and December 2022.

Singapore ranks highly against standard measures of health as well as the efficiency of its health system. With a rapidly ageing population and rising rates of chronic disease, new investments in PHC prioritize the social determinants of health, including environmental factors and economic development. This approach is embodied in the September 2022 White Paper on Healthier Singapore (Healthier SG) (1), which aims to empower individuals in disease prevention and health promotion, support family medicine, enhance links between health services and community organizations, improve information technology and service integration, and reform health financing through introducing capitation payments at the primary care level.

Mixed public–private health services and financing models, alongside good governance led by the Ministry of Health (MoH), are key factors. Among the lessons learned from the COVID-19 pandemic include the need to strengthen public-private partnerships, public health planning capabilities, community engagement to build public trust, and information systems.
**Introduction and national context**

Singapore’s commitment to strong public health systems is well documented (2, 3), with investments in good governance and social determinants of health having underpinned PHC development in the country (4–6). The COVID-19 pandemic has re-enforced the importance of PHC, with primary care playing a key role in supporting a successful response (7).

When Singapore became self-governing in 1959, the country faced serious problems in public health linked to overcrowding and poor public sanitation. At that time, the top causes of death were infectious diseases like tuberculosis (TB) and pneumonia. The first priority was to develop preventive services and a wide network of outpatient dispensaries and primary health clinics, especially for maternal and child health. Supplementary programmes were established to help malnourished children, and children were vaccinated against infectious diseases such as measles, diphtheria and polio. The country’s small size enabled the whole population to be reached quickly and efficiently, although health workers were faced with poor infrastructure to deliver services to rural villages and offshore islands.

As progress was made on these basic public health challenges, outpatient dispensaries and maternal and child health clinics were consolidated into polyclinics. Such clinics “acted as one-stop centres for general curative treatment, screening, immunisation and dental services. These [polyclinics] were sited in public housing estates, so that primary health care was delivered to Singaporeans’ doorsteps” (8).

With an emphasis on PHC, health improved dramatically, with simultaneous transitions in socioeconomic conditions and population growth. The national childhood immunization programmes reduced or eliminated many infectious diseases, infant and maternal mortality plummeted, and PHC programmes bore fruit (6, 9, 10).

**The health situation**

Singapore’s population stands at about 5.6 million people. An ethnically diverse country, the three main ethnic groups are Chinese, Malay and Indian. In terms of the age profile, 788 600 or 19% of the resident population are aged below 20 years, 2 606 500 or 64% are aged 20 to 64 years and 678 100 or 17% are aged 65 years and above (11). Singapore has a rapidly ageing population, with a crude birth rate of about 9 live births per 1000 population and a fertility rate of 1.2 children per reproductive-age female (12, 13). The average life expectancy is 83.5 years, one of the highest in the world.
Socioeconomic and demographic factors play an important role. Rising standards of living, high levels of education and literacy, good housing, a clean water supply and sanitation, basic social services, family planning and the active promotion of healthy lifestyles have together boosted the status and life expectancy of the population \(6, 14, 15\). At the same time, the forces of globalization, economic competition and open business and tourism, alongside a decline in fertility and family size, pose challenges for the health care system \(16\).

Furthermore, diseases associated with the affluent lifestyles are on the rise. Since 2000, diseases like diabetes, hypertension, high blood cholesterol, stroke and cancer have constituted more than 50% of all causes of death \(6, 16\). Singapore’s openness also means that it is susceptible to transborder diseases such as food-borne diseases, as well as infectious diseases like COVID-19, avian influenza and severe acute respiratory syndrome (SARS). The health authorities have instituted measures that range from banning the import of food from affected countries to preventing persons with suspected infections from entering. Public health measures have also been introduced for the control of epidemics. Apart from imported diseases, there are endemic diseases too, such as dengue haemorrhagic fever (DHF), malaria and melioidosis (soil-borne disease). Due to its open economy, the country is vigilant in maintaining a balance between its epidemiology of disease control and business practices \(6, 16\).

Past successes in improving the social determinants of health through overall socioeconomic development have resulted in an excellent level of health standards. Contributory factors include advances in public housing and environmental sanitation, the removal of urban slums, the availability of potable water, the provision of basic public health in maternal and child health services together with family planning, and a high coverage of immunization and health education programmes. A key factor too has been an efficient and strong government operating under principles of good governance \(2, 4, 6\). For example, Singapore has a strong and reliable system for cause of death certification and coding \(17\).

The dramatic declines in infectious diseases like TB have occurred with corresponding increases in non-communicable diseases (NCDs) including cardiovascular diseases and cancers, however, as well as in injuries and accidents. While recent years have seen deaths due to road traffic accidents decline and cardiovascular disease rates plateau, rates of breast cancer have continued to rise. Except for stomach and cervical cancer, mortality rates from all other cancers are still growing \(17\).
The health care system

The Ministry of Health (MoH) is the main authority entrusted with managing the health sector, although government policies on health span across ministries. In line with the government’s broad philosophy, the MoH’s objectives are to promote good health and reduce illness, to ensure the public has access to good and affordable health care that is appropriate to their needs, and to pursue medical excellence. The MoH strives to meet these aims through public policies for the delivery and financing of health care, regulation of health care and the enforcement of legislation, and use of information and public education.

The delivery channels for health services can be categorized across four levels that are grouped into regional clusters: 1) primary care (polyclinics, private general practitioners (GPs) and community hospitals); 2) secondary care (public and private hospitals); 3) tertiary care (public and private tertiary hospitals, specialized hospitals and national centres); and 4) other forms of community and long-term care (nursing homes, daycare centres and home care services). Essential primary care services are a hallmark of the health system, with attention given to accessibility and quality of care. The main challenges faced within the health system relate to the increasing costs of health care, the ageing population and a growing burden of chronic diseases, and social preference for more specialized services (5, 6).

Over the years, health literacy has improved, which has influenced public expectations of government health services. From the 1970s, health campaigns were conducted in response to rising chronic disease trends and to educate the population about healthy habits with messages to stop smoking, eat wisely, exercise regularly and reduce stress. The National Health Campaign in 1979, with its theme “Combat diseases due to harmful lifestyles”, focused on heart disease, high blood pressure, diabetes, mental health and lung cancer, as well as their associated risk factors. This represented early attempts to raise health literacy among the population. In the 1980s, public health education activities promoted healthy living. For example, the Healthy Heart, Healthy Life campaign was introduced in 1986 to increase awareness of the risk factors associated with cardiovascular disease. In the 1990s, similar programmes under the National Healthy Lifestyle Campaign featured a different theme for each year. In 1992, the Trim and Fit (TAF) programme was launched to reduce obesity and improve physical fitness among school children and youth, followed by the Great Singapore Workout in 1993 to encourage the population to undertake physical exercise through choreographed mass aerobic and stretching exercises. In 1998, the National Workplace Promotion programme encouraged companies to provide a healthy lifestyle for their employees by offering healthier options at staff canteens and allowing workers to leave earlier to participate in sports and games. Awards were given to companies that implemented such programmes successfully (5).
Efforts to promote a smoke-free Singapore started in the 1970s with the introduction of laws restricting smoking in public places and the prohibition of tobacco advertisements. In 1986, a National Smoking Control Programme was launched with the theme “Towards a nation of non-smokers”. It highlighted the ill effects of smoking and educated non-smokers on their rights in places where smoking is prohibited. Since then, smoking control has taken the form of public education, legislation and taxation. Legislative measures such as the Tobacco (Control of Advertisements and Sale) Act 1993 and the Smoking (Prohibition in Certain Places) Act 1992 prohibit the possession, use and supply of tobacco to under-18s. In addition, there are legal restrictions on smoking in public places. Tobacco taxation has also been increasing over the years. Collectively, these anti-smoking measures have contributed to a reduction in overall smoking rates. Recently, after allowing brief liberalization, the practice of vaping and the use of related products have been banned (5).

Other recent campaigns have focused on cancer prevention, particularly breast cancer. Plans were implemented for national screening programmes for cervical cancer along with similar calls to reduce morbidity rates from increasingly common diseases of breast and colorectal cancer. As a result of various campaigns and policies, several crucial predictors of health have improved during selected periods. However, reports of high rates of disease risk factors have prompted new MoH-led campaigns such as the introduction in 2016 of a whole-nation approach to tackle diabetes (6).

In 2012, the MoH launched a set of reforms under its Health care 2020 Masterplan (18) and undertook systematic efforts to develop a strategy for the fundamental and sustainable transformation of the health system. The reforms culminated in the government’s White Paper on Healthier SG (1) and a plan to achieve the stated goals through major financing reform to promote family medicine. Some aspects of Singapore’s response to the COVID-19 pandemic are addressed, such as the importance of community participation, public-private collaboration multi-sectoral approaches to public health planning and achieving a balance between preventive public health services and curative service models. The White Paper maintains the goal of universal health coverage as stated in the World Health Organization (WHO) Astana Declaration on PHC (19).

**Methodology**

A literature review was conducted to identify journal papers and policy documents relevant to PHC in Singapore. Keywords included: PHC, Public Health, Preventive Medicine, Disease Prevention, Environmental Health, Maternal and Child Health, Health care Services, Health Education, Health Promotion, General Practice, Family Medicine, History of Health Services or Health care System in Singapore. Included papers were published in English. Stakeholder consultations were also undertaken with past and present major office holders and administrators in the public and private health sectors.
The five strategic actions from the Regional Framework on the Future of Primary Health Care in the Western Pacific Region (21) were used to guide data collection and analysis of PHC strengths and challenges, namely: appropriate service delivery models, empowered individuals and communities, fit-for-purpose PHC workforce, PHC financing, and a supportive and enabling environment. The review was conducted at the same time as the introduction of PHC reforms outlined in the White Paper on Healthier SG (1), therefore papers relevant to these reforms were also included in the study.

**Appropriate service delivery models**

PHC is a critical part of the health care system being reformed at the time of writing in 2022. Reforms include re-organization of primary care services to serve a growing elderly population and a higher incidence of chronic complex conditions. The quality of primary care has been variable, particularly for patients with chronic diseases. Chronic care tends to be episodic and uncoordinated, with an imbalance in the workload and capacity of the public and private health sectors (22–24). Over time, health has improved through the introduction of basic public health measures and by changing social habits and lifestyles through health promotion and preventive programmes. Mass immunization programmes and efforts to control infectious diseases have tended to be prioritized over costly, technologically advanced specialized curative care. A balance of investment in basic preventive care with curative approaches has been a hallmark of the government’s strategy for health care (6).

Immunization against major infectious diseases like TB, poliomyelitis, diphtheria, pertussis and tetanus has been compulsory by law since independence in 1965. Coverage has gradually increased through strong implementation efforts in the public health sector supported by enforcement by the authorities. Historically, the Maternal and Child Health Services (MCHS) and the School Health Services (SHS) divisions in the public sector and medical practitioners in the private sector have been responsible for implementing Singapore’s immunization programme. Immunizations are provided free of charge at MCHS clinics and by the SHS in schools (5, 25, 26). Around the 1970s, disease patterns changed when chronic degenerative conditions like cancer, coronary heart disease and diabetes, rather than infectious diseases, became the leading causes of death.

Changing lifestyles and risk factors including physical inactivity, obesity, cigarette smoking, excessive alcohol intake and the consumption of rich and fatty foods meant that Singaporeans were predisposed to rising levels of chronic diseases. Public education programmes to promote a healthy lifestyle through regular exercise, a healthy diet and the reduction of smoking became a key focus for the government’s health policies, alongside the delivery of primary care services (5, 6, 27). The Public Health Division of the MoH integrate related departments involved in PHC, including the promotion of public health. What would have been considered environmental health services in other countries
became a separate function in 1976, forming the nucleus of the Ministry of the Environment (29, 30). The current Ministry of Sustainability and the Environment has responsibilities for environmental health, including setting hygiene standards for public food safety, sanitation, water programmes and vector control activities. The Alma-Ata Declaration in 1978 (28) provided a backdrop to policy changes relating to public health.

At the time of writing in 2022, 20% of primary care services is provided by the public sector through 18 polyclinics, while around 2000 private clinics provide the remaining 80% of services (23, 24). The distribution of chronic disease patients is heavily skewed towards the public sector, with 45% of chronically ill patients supported by government-run health services and facilities (23, 24).

COVID-19 response efforts built on this strong PHC foundation. A whole-of-government approach was adopted. A Multi-Ministry Task Force on COVID-19, advised by the Deputy Prime Minister and co-chaired by the Minister of Health and the Minister of National Development, consisted of several other government ministers to support multi-sectoral efforts. The Task Force was supported by the appointment of a 13-person Expert Committee made up of prominent public health personalities in biostatistics, epidemiology, infectious disease, virology and clinical medicine.

**Empowered communities**

In response to changing patterns of disease, the focus shifted from hygiene to the prevention of chronic diseases through population-wide campaigns and targeted programmes for healthier lifestyles. Communities have been persuaded to take responsibility for their health and to pursue a lifestyle in avoidance of habits like smoking and an unhealthy diet. Educational efforts have stressed the importance of regular exercise, balanced nutrition, screening for the early detection and management of chronic conditions, and reduced stress. To help reshape the health landscape, a Primary Care Master Plan was developed in 2011, supported by consultations with GPs. This Plan developed into the Primary Care Networks (PCNs), in which participating clinics received MOH funding for nurse counsellors and care coordinators to provide team-based care for chronic diseases. Primary care partnerships were further enhanced with the Community Health Assist Scheme and the PCNs (5, 31, 32).

The government responded to evidence reporting an association between strong public trust in government and higher vaccine coverage (33). High levels of trust in the government contributed a COVID-19 vaccination rate of over 90% (33). Vaccines were provided free of charge through the public and private sectors via health centres, public buildings and community centres. When the second wave of COVID-19 cases spread to foreign workers in early 2020 from March to May, the state established alternative quarantine facilities for workers with health treatment and immunization requirements that replicated those for
the local community. Infection rates among foreign workers were subsequently controlled (7). These efforts were made possible through effective coordination between government agencies and transparent daily communication with the public as overseen by the COVID-19 Task Force.

**Fit-for-purpose PHC workforce**

In the recent past, nurses were retrained as nurse practitioners to deliver health counselling and public health management of stabilized chronic conditions, which previously had been delivered by senior nurses. A National Nursing Task Force was set up by the MoH in 2012 to review and recommend the career development, autonomy, recognition and education of nurses. Nurse clinicians were recognized for their experience in a direct care role and their contribution to cross-institutional learning. Senior nurses were granted the autonomy to make protocol-based diagnoses, undertake investigations for certain disease profiles and order treatments. They were given the authority to prescribe, review and discontinue medications, while support care staff were upskilled to take on roles delegated by nurses, where patient care was relatively simple and routine (5). In 2020, the National Nursing Academy was launched to support the continuing education and training of nurses and to provide a skills development roadmap for nurses working in community-based settings (1). Pathways are being made available to enable citizens to make mid-career moves into the health care sector and to upgrade the skills of existing health care workers (1).

During the COVID-19 pandemic throughout January 2020–December 2022, many private GP clinics were closed initially as employees were unwilling to work. To support the pandemic response, trained health personnel were deployed from the private or voluntary sectors and were incentivized to vaccinate citizens and provide quarantine services. Volunteers were temporarily designated to enforce mask-wearing and social distancing in public places such as markets, food centres and shopping centres. Through such public–private collaboration, scare resources could be deployed optimally between the various health sectors and levels of care (36–38).

**PHC financing**

Singapore’s National Health Plan of 1983 paved the way for the introduction of a savings approach to financing health care (39). Later, in 1991, a major review was conducted, emphasizing health promotion and disease prevention as the basic philosophy underpinning health care policies (40). In its main report published in 1992, the Review Committee made recommendations on health care financing and defined the role of the government (41). The government accepted the recommendations and a Ministerial Committee on Health Policies headed by the Deputy Prime Minister eventually finalized the course of action to be
implemented. In a White Paper on Affordable Health Care presented in October 1993, the government set out its strategy to control health care costs and keep basic health care affordable to all – this included defining a basic medical package, managing the supply of doctors and hospital beds, and regulating public hospitals through revenue caps and subsidies (42).

To respond to an ageing population, the concept of saving for health care has been promoted with the implementation of the Eldercare Shield as a compulsory long-term care financing scheme (43, 44). The integrated “3Ms” scheme – Medisave, Medishield and Medifund – is designed to generate basic savings and shift health financing away from a dependency on universal taxes. The mixed model of integrated health care and long-term financing systems institutes personal savings plans and the targeted co-payment of health insurance with public–private contributions, and with endowment rather than pay-as-you-go budgets (3, 6, 45).

Alongside savings schemes, public subsidies ensure that health care remains affordable. The Community Health Assistance Scheme (CHAS), for example, launched in 2012, provides subsidies for low- and middle-income families and the elderly to access primary medical and dental care provided by private practitioners. CHAS was extended in 2019 to enable all citizens to receive subsidized treatment through the Chronic Disease Management Programme, making it easier for residents to use Medisave to pay for chronic care (5). Long-term care has also become more affordable with the launch of CareShield Life in 2020, which provides improved coverage for life for long-term care expenses. This compares with ElderShield, which was designed specifically for those with severe disability. To improve the utilization of preventive care, since 2017 subsidies have been provided for recommended screenings under the Screen for Life programmes at CHAS clinics. Additionally, enhanced subsidies have been provided for nationally recommended vaccinations for adults and children, as well as full subsidies for Childhood Development Screening at CHAS clinics since 2020. This additional financial support at the community level is expected to support GPs to practice holistic preventive medicine and serve as the first point of contact to manage health. However, the right financial incentives will be required to train family practitioners (46).

### A supportive and enabling environment

PHC has developed in a context known for its high quality and efficient public services. A range of plans and programmes have been designed to deliver health care according to the changing needs and profiles of the population. The MoH coordinates between the public and private health sectors; improves the quality and standard of medical care at the primary, secondary and tertiary levels; and ensures the adequate supply of trained human resources and facilities for the implementation of prioritized programmes and specialities. As a regulator, the MoH uses its statutory powers to control, license and inspect hospitals, clinics and other health facilities. It regulates the standard and practice
of health care services and the conduct and ethics of medical practitioners through the management of professional boards. All private hospitals, clinics, laboratories and nursing homes are required to maintain high standards through licensing by the government (6).

In its strategy Health care 2020, launched in 2012, the MoH set out its plan to transform the primary care system into Regional Health Systems (RHS) (18). Under the plan, each RHS comprises an acute general hospital that works closely with community hospitals, nursing homes, and home care and day rehabilitation providers, as well as polyclinics and private GPs within a specific region. The approach was built on the premise that the home is the central location for care, with the PHC system delivering patient-centred care that is integrated with secondary and tertiary care, as well as intermediate and long-term care. The vision was to move the patient seamlessly through the system from diagnosis and treatment to post-discharge follow-up, while providing coordinated, patient-centric care at the right sites (Figure 1).

Figure 1. Vision of the future health care system

Health care was also a major concern in the national Our Singapore Conversation (OSC) consultations, conducted in 2012–2013 to understand the population’s future vision. Following this, the MoH and the Health Promotion Board launched a national Healthy Living Master Plan in 2014 (47). This Master Plan adopted an inclusive and integrated approach to strengthen interagency collaboration and to build on existing infrastructure to allow Singaporeans to live healthy lives. It aimed to bring healthy living to the doorstep of every home, workplace and school through a social marketing approach. The Plan set out the three Ps for healthy living (Place: a conducive environment, People: a socially inclusive community and Price: affordable options) yet gave few details on how these objectives were to be achieved.

Following this, in 2016, the MoH presented three fundamental shifts – referred to as the Three Beyonds – that would guide the long-term transformation of the health care system. These were: beyond health care to health, beyond hospital to community, and beyond quality to value. Underlying these was an understanding that the future health care system must be integrated to address the wider health and health-related social needs of individuals across the life course. Hence, the framework for transformation reaffirmed the role of personal responsibility in health, not only to protect the use of government resources but also to recognize that the needs of individuals, families and communities can be met most effectively by working in partnership with the health care system (48).

**White Paper on Healthier SG**

Since the launch of the Health care 2020 plan in 2012 (18), the MoH has expanded health care capacity across primary and long-term care. These systems transformations culminated in the launch of the White Paper on Healthier SG in 2022 (1). An ambitious strategy built on the life-course approach, Healthier SG is designed around five key strands: 1) mobilize family doctors to deliver preventive care for residents; 2) develop health plans that will include lifestyle adjustments, regular health screenings and appropriate vaccinations which doctors will discuss with residents; 3) mobilize community partners to support residents in leading healthier lifestyles; 4) launch a national health enrolment exercise for residents to commit to seeing one family doctor and to adopt a health plan; and 5) set up necessary enablers such as information technology, a manpower development plan and a financing policy to make Healthier SG work in practice. The MoH will work closely with regional health care clusters, family doctors and community partners to implement the plan (1).

The White Paper on Healthier SG thus embodies the main principles of PHC implemented in Singapore. The COVID-19 pandemic has underscored the importance of this policy direction. Healthier SG seeks to develop an effective PHC system by empowering the population through health literacy and through strengthening disease prevention and health promotion, backed up by family physicians who are incentivized to implement health plans through capitation payment (1). The longer-term effects of these critical reforms in PHC in Singapore will require further evaluation.
Conclusion and lessons learned

PHC has developed within a context of open competition, good governance and shared responsibility (2, 4, 6). This has facilitated the design of innovative mechanisms to achieve affordable, high-quality and well-regulated health care under a mixed model of public and private health services and financing (4,6). The health system falls largely under the purview of the MoH, but it also includes shared responsibilities with the community and the private sector. While Singaporean culture emphasizes the fundamental contributions of older generations, which involves strong family support for ageing populations, the values of personal responsibility and self-reliance are also important (4, 6). In this regard, mandatory personal savings - especially for health care - plus high national savings put the country in a strong position to prepare for and respond to health crises such as the COVID-19 pandemic (49, 50).

Encapsulated in the White Paper on Healthier SG (1), Singapore has launched an ambitious initiative for a life-course approach to improve population health. It is built on the core principles of a health systems approach, as advocated by WHO through PHC, and aims to ensure a sustainable health system (51, 52). A robust monitoring and evaluation framework will be important to ensure that these aims are effectively implemented.

The COVID-19 experience revealed a need to strengthen some public health functions, but also demonstrated effective multi-sectoral governance and an inclusive approach as demonstrated in efforts to engage migrant workers (53). The White Paper on the government’s response to COVID-19 identified seven main lessons. These were: 1) prioritizing and adapting quickly to changing conditions; 2) strengthening resilience to better prepare for disruptions and to bounce back from shocks; 3) developing an eco-system to support and nurture people and private sector relationships; 4) systematically building up public health expertise and organizational capacity; 5) institutionalizing science and technology in pandemic crisis management, involving investment in digital technologies; 6) strengthening structures and capabilities for forward planning; and 7) having transparent and clear public communications to build trust (20). There may also be an opportunity to establish a dedicated centre for public health to consolidate disease control and pandemic management capabilities (54).
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This case study was developed by the Alliance for Health Policy and Systems Research, an international partnership hosted by the World Health Organization, in collaboration with the WHO Regional Office for the Western Pacific (WPRO) and WHO country offices. In 2015, the Alliance commissioned the Primary Health Care Systems (PRIMASYS) case studies in twenty low- and middle-income countries (LMICs) across WHO regions. This case study builds on and expands these previous studies in the context of the COVID-19 pandemic. This case study aims to advance the science and lay a groundwork for improved policy efforts to advance primary health care in LMICs.