THE EVOLUTION OF PRIMARY CARE IN CHINA: ITS PAST, PRESENT, AND PROSPECTS FOR THE FUTURE

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ABSTRACT

Primary care covers a range of preventive services and treatment for common illnesses and is widely perceived as the core of a comprehensive, cost-effective, and integrated system of health services. China's primary care system has undergone many changes since the 1949 revolution. The first phase of primary care development (1949-1976) emphasized introducing community-based primary care workers to strengthen accessibility, affordability, equity, efficiency, and effectiveness of healthcare in rural China. The second phase (1978-2009) enabled market-based reforms in the healthcare sector in the 1980s, which substantially affected and eliminated the primary care system in rural areas of the country and allowed a hospital-centric system to emerge. In the third phase (early 2000s), the Chinese government recognized the need to revive and strengthen the role of primary care in order to transform a fragmented and underperforming system into one that delivers more effective, efficient, and equitable health care to meet growing population needs and demands (Yip & Hsiao, 2014). However, primary care services in China are facing a workforce crisis. A sufficient, well-functioning healthcare workforce is essential to help China reach the national strategy known as "Healthy China." Many countries around the world have placed great emphasis on primary care and made strong efforts in improving policies in educating, deploying, managing, and regulating the healthcare workforce in support of primary care. The Chinese government can apply basic lessons from these approaches, including the importance of: 1) transforming the healthcare professional pathway to better supports primary care professionals; 2) improving the workforce composition and capability to meet the demand for primary care services; 3) revising the compensation system to increate strong incentives for high-quality primary care; 4) changing the headcount

quota system to promote a more adaptable workforce market for healthcare and effective healthcare worker management.

CHAPTER 1

INTRODUCTION

1.1 The Ups and Downs of Primary Care in China

Primary care focused healthcare systems have huge benefits for population health and wellbeing. Some developing countries thus believe that expanding the reach of primary care services is crucial to improving health; one of these countries, China has selected primary care as a policy priority for the next decade.

In 2016, China launched an unprecedented and ambitious plan—Healthy China 2030—and pledged to build a comprehensive primary care system to deliver accessible and high-quality healthcare services that are prevention-focused, integrated with behavioral healthcare and social services, and more equitably distributed. In setting forth this plan, the government affirmed its role in the healthcare sector and committed to shift the contemporary, hospital-based Chinese model of healthcare toward a more community-based and primary care-focused system that can at once be more effective, efficient, and equitable.

China made significant progress in strengthening its primary care system in the years following the revolution that brought the Communist Party to power in 1949. In the 1960s and 1970s, China's barefoot doctor system was praised around the world because it provided inexpensive and accessible medical care for rural populations (Tu, 2016), contributing to significant improvement in health outcomes by providing basic clinical care and preventive health services to a large proportion of the population. The barefoot doctor model became renowned in primary care development and served as the inspiration for the World Health

Organization's Declaration of Alma-Ata in 1978, which identified primary care as the key to the attainment of the goal of health for all (WHO, 2022).

In the early to mid-1980s, however, with the advent of China's post-Mao political and economic transition, the Chinese government's subsidies for primary care providers were substantially reduced; these providers had to act as for-profit entities, which led to the escalation of out-of-pocket healthcare spending and inappropriate services throughout the country. The unintended consequences of a more market-oriented system including a general increase in healthcare expenditures (Li et al., 2017), diminished access to healthcare (Hu et al., 2008), widening healthcare inequities (Tang et al., 2008), and erosion of the community-based healthcare workforce (Meng et al., 2009).

In response to such challenges, China's 2009 healthcare reform initiative included a series of changes to the country's primary care system, including increased subsidies to achieve universal insurance coverage (Yip & Hsiao, 2008), establishment of a national essential drug system (Ma et al., 2019), and increased investment in primary care facilities (Yip & Hsiao, 2014). Together, these developments have begun to improve the accessibility and affordability of primary care (Meng et al., 2012). Healthy China 2030 aims to make the primary care system into the central mechanism for providing every citizen with access to basic and affordable healthcare and also the site to address the increasing challenge of chronic non-communicable diseases and health expenditures. This plan is a direct response to various social and economic transformation that threaten to pressure the existing primary care system (Li et al., 2017). Thus, after a long period of neglect in the late 1900s, primary care has re-emerged as an important part of the national government's plan to provide universal coverage and affordable basic care for all the Chinese people.

China's healthcare system, including the role of primary care, has undergone many changes since the 1949 revolution. A more cost-effective primary care system that focuses on prevention, health promotion, and disease management, with functioning coordination among primary, secondary, and tertiary healthcare providers, is imperative for China's healthcare reform (Yip & Hsiao, 2014). Primary care in China still lags behind other countries with primary care-focused systems. The core functions of primary care such as disease prevention, gatekeeping role, referral system, and healthcare coordination, are not being met in China. There is no single primary care system that will suit all nations; many countries are still experimenting with systems to determine what best fits their characteristics. Similarly to these countries, China should innovate and find a model best suited to its needs.

In this dissertation, I will attempt to answer all these general questions:

- How has primary developed over time in the context of changes in the broader healthcare system in China?
- What social, economic, and political factors drove the different phases of reform in China's primary care system? How important has the central Chinese government been in initiating, funding, and administering changes in the healthcare system?
- How did the last decade of healthcare system reform affect primary care in China? What can the government do to further strengthen the primary care system?
- Overall, how well does the current healthcare system serve the Chinese population? How well does the current healthcare system help China achieve its policy goals?

- What are the priorities for further healthcare reform in China? This dissertation aims to answer these questions.

In addressing these questions, I describe and analyze key phases in the development of China's healthcare system, with a special focus on the rise and fall of the primary care system from the 1940s to 2000s and why it failed to leave a lasting institutional foundation, forcing the national government in important ways to re-focus in the 21st century.

In chapters 2, 3, 4, and 5, I investigate 1) how changes in China's political landscape, economic development, and social reform have directly and indirectly affected the nation's healthcare system and 2) how and to what extent the Chinese government has made significant progress to strengthen its healthcare system over past century. In chapter 6, I propose comprehensive reform of healthcare workforce policies to further strengthen the primary care system as the core of a new generation of health care modernization and development.

1.2 What is Primary Care?

Primary care covers a range of prevention, wellness, and treatment for common illnesses and is widely perceived as the core of a comprehensive, cost-effective, integrated, and rational health services system. Primary care physicians (PCPs), including a range of clinical personnel – physicians, general practitioners, physician assistants, and nurses – are responsible for serving as the first point of contact for patients and providing continuous, comprehensive, coordinated care to populations undifferentiated by gender, disease, or organ system (Starfield, 1994). This professional team often maintains long-term relationships with the population in a community setting and advises and treats their patients on a range of health-related issues, as well as coordinating patients' care with specialists as needed.

As early as 1920, the term “primary care” originated in the U.K. when the British government identified it as the most basic level of a structured health care system (Bitton et al, 2017). Since then, a profound evolution has occurred toward understanding the important role of primary health care in people-centered health care systems. The U.S., South Africa, and India began to experiment with community-oriented primary care programs in the mid-twentieth century and have successfully produced great population health results (Bitton et al, 2017). Decades later, the Alma-Ata Declaration of 1978 was a landmark policy in defining and offering a direction for primary care and promoted “primary care” as a key strategy to address health inequalities and attain the goal of “Health for All” (WHO, 2018; Starfield et al., 2005). This declaration prompted a series of primary care programs and initiatives from WHO and national governments in the years that followed. More and more countries, particularly the low- and middle-income countries, recognized primary care as a core component of cost-effective health systems, believing their countries would achieve better health levels, higher population satisfaction with health services, and lower health care costs including for medications by orienteering their health systems toward primary care (WHO, 2018; Kruk et al., 2010).

1.3 Primary Care and Health Outcomes

An extensive review documenting the development of primary care in Latin improves effectiveness, efficiency, and equity of heath care. Specifically, the review concluded that primary care focused health systems have positive impacts on population health and lead to better overall health indicators, including increased of life expectancy and significant reduction of premature mortality rate.

Since the Declaration of Alma Ata, national-level primary care investment and reforms in Latin American have enhanced access to health care services and improved the population’s

health outcomes. For example, Cuba's health policy emphasizes primary care, prevention, and community services, and the active citizen participation. The nation's universal primary health program heavily relies on family health physicians and nurses, providing universal and comprehensive care to geographically defined areas with a focus on families (Macinko et al., 2009). By the 1990s, Cuba's primary care program posted family doctors and nurses throughout the country, thus increasing the serviced population to more than 95% of the population (WHO, 2008). This emphasis on primary care have produced an impressively high ranking in major health indicators, including a 40% decline in infant mortality over the past 40 years (Waitzkin, 1997).

Similarly, several decades of rapid primary care expansion in Costa Rica have made a significant contribution to increasing the population's life expectancy and lowering its infant mortality rate (Unger et al., 2008). Life expectancy reached 74 in 1985, and infant mortality declined from 60 per 1,000 people in 1970 to 19 per 1,000 people in 1985 – levels comparable with those in wealthier countries (Starfield et al., 2005). In addition to the primary care system, this improvement was due to the nation establishing a social security system, better funding education and public sanitation, and making secondary and tertiary healthcare more accessible (Macinko et al., 2009).

Brazil's family health program (FHP) also provides all core primary care functions and is perhaps the largest community-based primary health care program around the world. Several studies demonstrate the association between this family health program and lower infant mortality. From 1990 to 2002, the nation increasing FHP coverage by 10% and averaged a 4.6% decrease in infant mortality. Further, the infant mortality rate fell 13% as its population with

heath care coverage increased from 14% to 60% due to the expansion of primary care teams (Macinko et al., 2006).

Mexico has seen a dramatic drop in the child mortality rate since 1980 due its primary care system; a drop from 64 per 1,000 live births to 23 per 1,000 by 2006 (Boseley, 2006). Specifically, certain aspects of primary care helped to achieve this: continuity of care, public healthcare facilities, and a sufficient referral process (Starfield et al., 2005). The country's investments in public health, including in immunization, sanitation, and health education have also contributed to the reduction in infant mortality rate (Macinko et al., 2009).

Like the foregoing countries in Latin America, several Asian countries, such as Thailand and Indonesia, have also improved population health through investing in comprehensive primary care systems. In Thailand, the government expanded rural care quite dramatically by vowing to establish one primary care center in every rural village by 1990. By doing so, its under-five mortality rate decreased by 32% (Vapattanawong et al., 2007). In Indonesia, improvement in primary care resulted in a 20% reduction in infant mortality during the early 1990s (Simms & Rowson, 2003; Macinko et al., 2009). Some evidence also shows that this country's infant mortality rate would actually increase by 14% if primary care spending substantially decreased (Simms & Rowson, 2003).

These cross-national experiences conclude that primary care is the foundation of efficient, equitable, and affordable health systems, and can improve population health in terms of life expectancy and mortality. Indeed, primary health care addresses the majority of health needs for many people, regardless of where they are born, grow, work, and live, their age, and their socioeconomic status.

1.4 Additional Benefits of Primary Care

In addition to enhancing health outcomes broadly, primary care supports overall population health and well-being. Specifically, it does so by making health services more accessible, emphasizing prevention, advancing the quality of care, delivering efficient and effective care, and lowering the need for specialty care.

1.4.1 Greater Access to Health Services

The main role of primary care is to reduce and eliminate difficulty with accessing necessary health services, which is particularly important for vulnerable populations that may not have the means to access health services otherwise. Disadvantaged populations are at higher risk of receiving disparate medical care because of financial constraints, insurance status, and socioeconomic status. Compared to advantaged population, disadvantaged populations often lack a regular source of health care and have less access to secondary or tertiary care services.

Primary care programs can successfully narrow these gaps in health care. Most countries dedicated this system can provide low cost or even free health care services, thus ensuring that disadvantaged groups will have equitable access said services.

Overall, vulnerable population gain greater healthcare access through primary care, and has the effect of helping to alleviate the socio-economic inequities in healthcare (Starfield et al., 2005).

1.4.2 Improved Quality of Care

Compared to the specialists who adhere more closely to disease-specific guidelines for particular health issues, primary care providers implement an all-encompassing approach to

health and also provide comprehensive follow-up services, which implies that the primary care offers equal or better services to patients in various conditions than specialist care (Starfield et al., 2005). Demonstrating the effectiveness of primary care for patient with diabetes, the U.K. designed a study comparing the quality of care said patients received from general practitioners (GP) in diabetic clinics versus specialists in hospitals (Parnell et al., 1993). The results showed that GPs' better cared for the diabetic because they better controlled glycemic, and their patients had lower mortality rates (Griffin & Kinmonth, 2000).

1.4.3 Focus on Prevention

The most important characteristic in primary care is preventive intervention that provides a cost-effective way for people to avoid their health status becoming worse. An effective primary care system is one well-equipped with primary care providers because this can enable more preventative care and a higher quality of it. For instance, one study found that U.S. states with a relatively higher primary care providers to population are linked to lower smoking and obesity rates (Shi & Starfield, 2000; Starfield et al., 2005). Understanding their population's overall health profile, primary care physicians can recommend lifestyle changes to assist patients at high risk in becoming lower risk. In turn, a high ratio of primary care physicians to population that preventatively reduces the risk of illness can reduce overall medical expenses.

A robust primary care system also contributes to the early detection of specific diseases such as breast cancer, colon cancer, cervical cancer, and melanoma (Campbell et al, 2003; Starfield et al., 2005). Indeed, it has been found that just a 10% increase in the number of primary care physicians correlated to 4% increase in the chance of early-stage diagnosis (Starfield et al., 2005). Since prevention strategies are more standardized in primary care, primary care physicians recommend tests for their patients based on their health profiles, which

resulted in decreasing patients' risks of certain serious diseases, like heart disease and cancer. Ultimately, access to the appropriate number of primary care physicians and primary care service greatly increase the population's overall health by improving the availability of preventative care.

Primary care physicians are also in an important position to manage health problems early on, thereby helping to reduce the occurrence of serious health issues, hospital stays, and emergency service use. These physicians are responsible for recommending screening measures such as blood pressure tests, blood tests, breast examinations, mammograms, and pap smears – all of which can detect early changes that may indicate diseases. A study in the U.K. concluded a 15 to 20% increase in primary care physicians would result in a decrease in hospital admission rates for acute illnesses and chronic illnesses of about 14 per 100,000 people to and 11 per 100,000 people (Gulliford, 2002). Additionally, several U.S. studies show that access to primary care is highly linked to lower hospitalization rates. One study found that when children receive primary care services before and during hospital stays, rates of hospital admissions for children remain low (Starfield et al., 2005). Moreover, adolescents who live in a community with a good primary care are less likely to have emergency services (Starfield et al., 2005).

1.4.4 Appropriate Care

As the first contact point in the healthcare system, primary care operates as a filtering system. Having a good relationship with a primary care provider is strongly associated with less use of specialist and more appropriate care. The close and ongoing relationship between patients and primary care physicians helps health care providers understand patients' situations more completely. When patients know their physicians, visits are less stressful and more productive. It is easier for patients to talk about sensitive issues with primary care providers they know in familiar settings, than with strangers in unfamiliar places, which essentially defines the concept

of “continuity of primary care”: when patients are able to use their primary source of care over time, so most of their health are attended to by the same health care providers. This “appropriate care” is important for increasing a doctor’s odds of recognizing a patient’s health problem and thus providing more efficient services, using fewer laboratory tests, and producing fewer health care expenditures (Starfield et al., 2005).

1.4.5 Avoid Unnecessary Treatment

Primary care helps to make care more efficient by preventing patients from over-relying on specialty care. Because non-primary care specialists are trained in hospitals, they may not entirely understand their patients’ conditions, which might result in overestimating the possibility of health issues in patients. This can lead to needless and costly tests and treatments being deployed (Hashem et al., 2003; Starfield et al., 2005).

To reduce need for specialist care, certain countries such as the Netherlands and the U.K. have improved information systems and video communication for specialists who consult in the primary care setting. Compared with these countries, patients in the U.S. suffer from greater and more errors in healthcare and adverse effects from the said healthcare (Schoen et al, 2004; Starfield et al., 2005). This, combined with the foregoing consequences of over-involvement of specialists, may contribute the U.S. healthcare system ranking below many similar, modern wealthy countries (Schneider et al., 2017).

CHAPTER 2

HEALTH CONDITIONS IN PRE-REVOLUTIONARY CHINA

From 1840 to 1949, China was torn by wars and ravaged by disease. Western countries looked down on China and used the humiliating metaphor "the sick man of Asia" when referring to it. Although there are few accessible statistics from China in the 1930s, it has been estimated that the infant mortality rate was 130 per 1,000 live births in cities and 170 per 1,000 live births in rural areas, and nearly 16% of the population died before the age of one (Zhang, 1999). For comparison, the infant mortality rates in the U.K. and the United States during the corresponding period were far less, averaging 60 per 1,000 live births (University College London, 2018; Centers for Disease Control and Prevention, 1999). The most significant reason for China's extreme high infant mortality rate at this time was that midwives were usually illiterate and untrained in advanced techniques (Yip, 1995).

This country was also suffering from massive infectious diseases during the same decade. The most common causes of death included plague, smallpox, cholera and tuberculosis. Despite gross underreporting, cholera alone caused 40,645 and 34,519 deaths in 1938 and 1939, respectively (Li, 2015). China's annual death rate due to tuberculosis was 250 per 100,000 and caused 10 to 15% of all deaths (Chen, 1993; Liang et al., 1973).

2.1 Lack of Medical Resources

These highly contagious diseases flourished throughout China because of the country's lack of medical resources that in turn restricted people from accessing healthcare services and receiving timely treatment. By the end of 1945, only 16 of 22 provinces had established health centers (Li, 2015). In 1947, there were merely 1,437 county-level hospitals with roughly 15,000

beds across China, with approximately 10 beds per hospital (Wang, 2006). Prior to 1949, the number of county-level hospitals had decreased to 1,300 in 2100 counties because of the civil war, representing an average of 0.05 beds per 1,000 residents (Qian, 1984). The socialist Soviet regime, on the other hand, averaged 59 beds per 1,000 residents – roughly 100 times more than China (Tulchinsky & Baravikova, 2000). In Contrast, in developed countries, such as Japan, the average number of hospital beds was about 250 per 1,000 residents, 5,000 times larger than that of China (JICA, 2012).

China's county-level hospitals were unable to provide adequate, high-quality healthcare service for the population because health workers, health funds and medicine were in short supply. There were very few hospitals skilled enough to perform surgery. Further, the provision of health facilities was very uneven across the country, because they were solely concentrated in each county's town center. Villagers often lived too far from such health facilities and lacked adequate transportation to the townships; thus, these health facilities were mainly only available to the townspeople.

An extreme lack of health workforce and efficient medicines were other constraints that limited the provision of healthcare in China and resulted in the prevalence of diseases. China had approximately 300 to 450 million people in 1929, which would require 150,000 doctors to match European standards of adequate healthcare. In actuality, the number of doctors already trained in modern methods was fewer than 5,000, while only 500 students were enrolled in medical school where they were receiving substandard training (Borowy, 2009). By the end of 1948, there were roughly 500,000 health workers across China; the nationwide density of health professionals was merely 0.093%, much less than that of the U.K., where the figure was 0.8% (Li, 2015; Hawe et al., 2011). Few medical workers practiced "Western Medicine," so the majority of the rural

population depended only on Traditional Chinese Medicine (TCM) for medical relief. Further, the health fund for peasants was an insufficient couple of cents in Chinese currency per capita, leaving this population unable to afford expensive Western drugs that were necessary to fight serious infectious diseases (Li, 2015). Thus, these villagers instead relied on home-based consultations with individual TCM practitioners and then purchased the medicine their doctors prescribed at local medicine shops. Folk healers including herbalists, bonesetters, and snake doctors were also very popular among villagers because they could successfully treat minor illnesses with herbal medicine and inexpensive folk methods (Fang, 2008). The failure of TCM practitioners to control graver infectious diseases, on the other hand, resulted from their view of the human body and its functioning in a holistic way; in other words, the TCM focus on general well-being rather than on individual symptoms – an indirect approach to tackling diseases – when coupled with scarce medical resources, contributed to a life expectancy for males of only 34.9 years and a mere 34.7 years for females (Qian, 1984).

2.2 John Grant and His Influence on Chinese Health Care

John Grant, who received a medical education at the University of Michigan and a public health degree from Johns Hopkins University, conducted research in public health, a field in which he made a great contribution to China's modern health system (Bu & Fee, 2008). Specifically, Grant and his work had a long-term influence on three parts of China's healthcare system. These include the Nationalist government establishing a public health administration system and a national health administration system for universal care, and health stations in rural and city regions.

Before Grant went to China to assist the Nationalist government in these ways, he became a member of the International Health Board of the Rockefeller Foundation in 1918 and

later obtained practical experience in a county health program in North Carolina (Bu & Fee, 2008). This latter experience influenced his thinking about the importance of integrating preventive and curative medicine into community settings. From his point of view, public health is an inalienable part of society, and he contended that community health stations—providing both preventative care and curative medicine—could help achieve health for all.

Grant proposed a Department of Hygiene, which included health station, in October 1923 to the China Medical Board in New York. Skeptical of the common divide between preventative and curative medicine, he believed that "any artificial separation of curative and preventive medicine is detrimental to the efficiency of both" and that the "medicine of the future" required the "establishment of this combined curative and preventive medicine in a community in…a real "health station"" (Fee & Bu, 2007). Grant believed the future of medicine should be structed as general medical practitioners working with hygiene specialists in each community. With no existing models of an integrated curative and preventive medical care or education at the time, Grant experimented with his own vision to create a health station that included medical services, disease prevention, and vital statistics collection in a small town near Beijing (Bullock, & Andrews, 2014:214-215).

Following Grant's suggestions, the Beijing Health Demonstration Station was created in 1925. The station delivered healthcare to a population of 45,000 and provided health professionals with training (Bu, 2017). Based on his field work, Grant also adopted an innovative approach to public health education, offering basic training courses for municipal sanitary police and for traditional midwives that emphasized maternity and healthcare for children. These efforts culminated in the establishment of the First National Midwifery School in 1928 (Bu & Fee, 2008). More importantly, this health station also trained public health professionals and medical

students at Peking Union Medical College (PUMC), which was immersed in a community that already practiced preventive and curative medicine (Bu, 2012).

Grant and his colleagues also wished to promote primary care in the Chinese countryside (Bu, 2012). In 1929, they established another health station in Ding county, a county located west of Beijing. Here, they established a primary care and rural healthcare worker education program. The program was designed to offer adorable healthcare to rural people and support the professional development of rural health workers (Bu & Fee 2008).

Grant believed that the most affordable way to provide healthcare services to rural populations of low socioeconomic status – who resided in areas lacking medical personnel and facilities – was for the state to organize and fund healthcare (Bu, 2012). He believed that compared to state-funded universal medicine, private medicine would have certain disadvantages: more urban and rich areas would have far greater access to high-quality and well-equipped medical care than rural areas, which would be underserved. This would also disadvantage less affluent districts. In other words, in a private medical system, the upper class would have access to the best medical services, while the less affluent and the large middle class would not be able to afford the same services (Bu, 2012). Thus, Grant thought that universal medicine, with the goal of providing every patient with equal access to medical services, was the most apt plan for China. Ultimately, his efforts enlightened both the Nationalist government and the Communist Party and laid a solid foundation for future Chinese healthcare system reform.

2.3 Efforts of the Nationalist Government

The Nationalist government identified health as a part of the nation-building process and embarked on building a centralized health administrative system, which they saw as the core of

their health policy (Yip, 1995; Bu, 2017). Their purpose in scientifically applying Western Medicine to Chinese healthcare was to transform China from a traditional society into a modern nation. In other words, the Nationalist government perceived health improvement as a conduit to national strength and economic prosperity.

In 1928, the Nationalist Party (KMT) leaders asserted medicine as a public function. To this end, they established the Ministry of Health (MOH) and also issued a directive emphasizing the nationalistic theme that the quality of health was closely related to "the prosperity of the Chinese nation" (Yip, 1995). The administrative function of the MOH was divided into four sections which included two advisory boards, five administrative departments, special boards and committees, and health organizations, all under the ministry's direct supervision. The advisory boards comprised a Central Board of Health that advised both the leadership on national health policies and an International Advisory Council. This Council was made up of three international health leaders: Ludwik Rajchmen, the Medical Director of the League of Nation's Health Organization' Victor Heiser, Director of the Rockefeller Foundation's East of the International Health Board (IHB), and Arthur Newsholme of the British Ministry of Health (Yip, 1995; David, 2014). Rajchmen, who had conducted extensive research on poor countries, advocated that universal medicine was "the only solution for the application of curative and preventive medicine (Borowy, 2009)." Heiser, had experience incentivizing local peoples to learn about disease prevention measures and training local public health experts in rural areas to improve public health standards (Akami, 2016). Newsholme played a key role in building the British Ministry of Health (1919). He deeply argued that the government is responsible for the public's healthcare (Akami, 2016). The Chinese Nationalists attempted to take advantage of these three leaders' expertise in public health, preventive care and curative care, with the broader

goal of helping China to position itself as a strong, sovereign, and modern nation that can compete on the world stage (Akami, 2016).

Simultaneously, the MOH's five administrative departments were: Administration, Medical Administration, Health and Sanitation, Epidemiology, and Vital Statistics. They were responsible for supervising local health administration, medical practices, health education, developing health services, sanitary inspection and epidemic prevention (Yip,1995). Further, a large number of organizations were constituted under the MOH, including the health bureaus of municipalities, the health departments of provincial governments and other agencies such as the Central Hygienic Laboratory, the National Epidemic Prevention Bureau, and the First National Midwifery School. Together, the creation of this infrastructure for a national health administrative system helped the Nationalist government boost the practice of modern medicine and promote national health throughout China.

Within the MOH, Chinese medical elites evaluated the health systems in other nations like Great Britain and the U.S. before ultimately adopting for China a universal healthcare model similar to that found in several Western countries. To create the national health system, the Nationalist government set up an effective coordinating mechanism among the four administrative structures of city, county, town and village, and then attempted to deliver healthcare services by taking a top-down approach from urban to rural areas. The health institutions in major municipalities such as Beijing, Shanghai, Nanjing, Tianjin, and Guangzhou played an important role in this national health system, serving as its core. Healthcare services were expected to be extended from these big cities to provincial capitals, and then to the rural areas that were home to around 90% of the national population. To provide healthcare services to this large rural population, the MOH promulgated a comprehensive health policy that established

health organizations at the county level and lower administrative levels to develop a health center, station, and sub-station in each county, town, and village, with the county as the center of rural health administration (Bu, 2017). Each county's health center was to be staffed with doctors, nurses, midwives and assistants and was responsible for providing technical guidance to health facilities at the town and village levels. The Nationalist government hoped that this three-tiered, rural health administration system from county to village would be able to provide basic healthcare including epidemic prevention, basic medical services, midwifery, and health education.

However, while the Nationalist leaders focused on the institutional construction of a modern health administration system in China, they ignored certain obstacles that eventually resulted in their failure to modernize the nation's healthcare system like the absence of modern-trained doctors in rural areas, the people's preference for TCM, and the government's own lack of commitment to rural healthcare. Approximately 9,000 modern doctors were trained between 1928 and 1947 in the medical schools founded by the Nationalist government (Li, 2015), but few liked to go to the countryside; most remained concentrated in large cities, thus failing to provide any healthcare services in or convey modern scientific health knowledge to rural populations. To promote health modernization, the Nationalist government per the MOH also excluded TCM from the construction of China's modern health system, even though the large rural population relied on Chinese medical doctors and healers for their medical needs. Compared to Western medicine, TCM was generally much less costly, an essential consideration in seeking care for ordinary people. Consequently, the modern medicine promoted by Nationalist leaders was unaffordable to a significant majority of the Chinese people. Indeed, the high cost of Western medicine and the ban of TCM led to the spread of diseases in the countryside.

Further solidifying these issues, Chiang Kai-shek – the leader of the Nationalist Party and government at the time – did not express serious interest in health modernization. Although the Nationalist government focused on building institutional health organizations, they neglected to determine the rural population's true needs. Moreover, they were unable to invest adequate funds to set up effective healthcare programs in the countryside because they allocated most of their funds for the anti-communist suppression campaign programs, due to Chiang Kai-shek's concentration on eradicating the Chinese Communist Party (CCP). Without the full commitment of the state, modernizing medical services to the people was simply unachievable at this time.

2.4 Efforts of the Communist Party

Following these initially promising yet ultimately failed efforts of the Nationalist government, Mao Zedong – leader of the CCP's revolution – concentrated on promoting preventive healthcare in hopes of improving national healthcare in China. He thought this focus would address the underlying socioeconomic problems leading to the rural population's poor health statuses, while also winning local people's support in his goal to develop a new, CCP-led society. Different from the Nationalist government's efforts, the health movement of the CCP emphasized improving hygiene, living conditions and preventive healthcare for their revolutionary bases in rural areas. The CCP made substantial progress in disease prevention activities, including public education, organized hygienic practices, and excrement disposal. Their health programs were guided by their socialist political ideology and vision of an equal society (Bu, 2017).

Compared to promoting modern medicine in rural areas as the Nationalist government had attempted, CCP leaders strengthened a combination of Western medicine and TCM to encourage the rural population to find an appropriate compromise to treat their illnesses. To deal

with the shortage of modern medical personnel in the countryside, the Communists founded the first CCP medical school in 1932 called the "Chinese Workers and Peasants Red Army Medical School" to train modern health professionals (Bu, 2017). From its founding through October 1934, the school trained 181 medical doctors, 75 pharmacists, 300 nurses, 7 researchers, and 123 hygiene workers, totaling 686 healthcare professionals who could practice both Western medicine and TCM in military and civilian hospitals alike (Bu, 2017). Also during this period, the Communists recruited numerous TCM practitioners to collect herbs in the mountains and to produce medical supplies from them. They hoped these handmade traditional medicines would help local populations tackle local diseases and treat wounded soldiers in an inexpensive way. By valuing both traditional Chinese and Western medical methods in instruction and practice, the CCP garnered political support from TCM practitioners and rural populations.

Their "prevention first" policy directly related to primary care. Formulated in 1932 to educate and mobilize the soldiers and the masses to improve their living conditions, this policy included a formal "hygiene week." The policy called on the Red Army to collaborate with local residents to clean their houses, which became a routine activity in introducing health information wherever they went (Bu, 2017). Communist health workers were responsible for disseminating medical science and knowledge to change rural population's health attitudes and behaviors. Efforts to enhance health awareness mainly concentrated on improving sanitary conditions for wells and latrines; by improving water supplies, leaders aimed to reduce the pervasiveness of infectious diseases. To achieve these goals, rural populations were encouraged to dig wells away from animal pens and cover them when not in use. To prevent potential pollution of water, the CCP also emphasized latrine improvement and instructed most to be built away from farmers' living quarters (Yip, 1995; Bu, 2017). In addition, health workers guided farmers to better

disposal practices for storing human excrement and using animal dung as fertilizer. Collectively, these preventive health activities contributed to the significant improvement of environmental and living conditions in rural Chinses areas, and to the reduction in prevalence of local diseases.

Communist leaders believed that winning the support of the rural masses was the primary strategy and a key component of the Revolutionary Movement. Therefore, the CCP's health policy involved the revolutionary goals of changing society and liberating the people from social, economic and health suffering (Bu, 2017). The development of large-scale rural health programs that addressed the virtual absence of modern medicine in these areas was difficult for the CCP in practice, however, because of the dearth of health facilities and medical personnel. Yet, focusing on preventive care that directly addressed the massive problems of unsanitary living was one way the CCP could improve health in rural areas while spending little. This preventative-care endeavor not only helped rural populations understand the importance of modern hygiene, but also disseminated the CCP's ideology via its massive health education campaign. The constructive relationship shaped between the CCP and the masses was in fact critical to the party's overall revolutionary pursuit and the future of this movement.

2.5 Conclusion

The different approaches to reforming China's healthcare system by the Nationalist government and the Communist Party elucidated their different priorities on health programs and medical policies. Significantly influenced by Western power, the Nationalists first identified their health program as an important component of institution-building in their desire to establish a modern nation; hence their attempts to build an institutional, hierarchical healthcare delivery system with a top-down approach to deliver healthcare in both urban and rural areas. With the help of health experts of the Rockefeller Foundation, the League of Nation's Health Organization

and the British Ministry of Health, Nationalist medical elites compared the developed countries' healthcare system models and used their analysis to create a distinctive centralized healthcare system for contemporary China. This healthcare system – flawed in many ways, however – was then inherited by the Communist Party, which implemented a more preventative-care approach via a combination of Western medicine and TCM practices, formal education for healthcare professionals, and public campaigns aimed to inform and improve people's daily health practices. This approach eventually contributed to the establishment of China's three-tiered healthcare system and vastly improved primary care in rural areas.

Both the Nationalist government and the CCP dedicated themselves to the improvement of health for the Chinese population and to the development of national healthcare priorities that embraced science, yet also served as a vehicle for promulgating their political ideologies. That is, modern medicine was an important component of the revolutionary goals of the Nationalists, just as the CCP embraced preventive care and a combination of Western medicine and TCM to further their political strategies. With an increasing number of health facilities and medical workers stemming from both political eras, the health conditions of Chinese people in big cities and certain portions of rural areas was significantly improved, and the average life expectancy increased nationwide. However, the urgent medical needs of most people in China's rural areas were not well considered or advanced by either political party, thus resulting in the continuation of common endemic diseases and very high infant mortality rates throughout the nation's countryside.

CHAPTER 3

PRIMARY CARE IN THE MAOIST PERIOD: 1949-1978

3.1 Healthcare Challenges

When the Communist regime came to power in 1949, CCP leaders proclaimed that drastically improving healthcare was an essential part of building China's socialist society and thus integrated health policies into their plan for the country's economic development. This was a demanding mission, however, because the CCP was confronted with severely scarce resources and crushing health challenges such as low levels of environmental sanitation and hygiene, infectious diseases in epidemic proportion, and limited medical workforce and healthcare facilities. At this time, only 3,670 medical and health institutions, 541,000 health workers and 85,000 beds at health institutions existed across China (The State Council, 2017). Worse yet, most of these medical resources were distributed solely in large cities, serving only 10.6 percent of the population (Li, 2015).

The shortages and maldistribution of medical resources resulted in extremely acute health problems in rural areas. The immediate solution for the CCP was to consolidate rural healthcare personnel to prevent major epidemics in the countryside. Given the financial obstacles and lack of health facilities, the CCP imitated their practices in revolutionary bases during the Sino Japanese War and the Chinese Civil War, namely by stressing preventive care rather than curative care and using TCM to serve the basic medical needs of ordinary people. As such, building a professional health worker team to perform preventive care was a significant part of the CCP's construction of rural healthcare. Simultaneously, as the relationship between the Soviet Union and the U.S. became increasingly tense in the Cold-War world, the World Health

Organization (WHO) – working with the Nationalist government of Taiwan – did not help the CCP in terms of either health worker training or comprehensive technical guidance. Instead, Chinese health workers learned Soviet preventive medical techniques in the 1950s because the Soviet Union was China's only ally (Bu, 2017). Hundreds of thousands of Chinese health professionals were thus trained in the country's new medical educational system, which was largely based on the Soviet model. Soviet Physicians assisted with training methods for Chinese healthcare workers (Rechel et al., 2014). Moreover, to compensate for the shortage of healthcare workers in the early stage of China's rural healthcare initiatives, the CCP also attempted to mobilize the masses to play an active role in their health campaigns. To this end, they fused preventive health work with the rural mass movement and placed a significant emphasis on improving daily practices around community sanitation and personal hygiene.

3.2 Foundation of National Health Policy

At the birth of the People's Republic of China (PRC), the temporary constitution – *Common Program of the Chinese People's Political Consultative Conference* – represented the importance of developing public health and medical work, and emphasized the health of mothers, infants and children. In November of 1949, the state established the MOH, which included the departments of medical administration, public health, women's and children's health, health planning and examination, health education, technical office, and medical science research committee (Bu, 2017: 222-223). China also built health departments and bureaus at different administrative levels – province, city, county and town – which together – formulated a national network of health institutions under the MOH.

In 1950, at the First National Conference of Health, the central government advanced a rural health-focused strategy. National health tasks prioritized the development of rural health.

To eliminate all obstacles to boosting rural people's health, the central government supported the county level governments, township level governments and villages by setting up state-owned county-level hospitals, health organizations, and collective cooperative health stations. Mao guided the MOH to codify basic political principles of contemporary Chinese healthcare policy, which included three tenets: (1) healthcare service should serve China's workers, peasants, and soldiers; (2) disease prevention should be emphasized; and (3) both Western medicine and TCM should be utilized (Li, 2015). The first two tenets were shaped to achieve the revolution's goals of serving the population and the CCP's general policy of prioritizing prevention to improve national health. Unlike the Nationalists who had abolished TCM, the Communists encouraged medical professionals to unite Western medicine and TCM – thereby improving practitioners' social statuses – and encouraging them to serve ordinary people. The First National Conference of Health also underlined four major goals of healthcare development, including: (1) strengthening and expanding basic health units; (2) readjusting public and private relationships with regard to medical, pharmaceutical and health institutions; (3) combining medical and pharmaceutical groups for mutual aid and study; and (4) expanding health education and training for various levels of health workers (Bu, 2017:224). In 1952, the fourth tenet "health promotion and mass involvement should be incorporated," was further formulated in the Second National Conference of Health (Li, 2015; The State Council, 2017; Dobson, 1981). These principles provided the political foundation and framework for the establishment and implementation of China's national health policies henceforth.

3.3 Healthcare Strategy with Limited Resources: Mass Campaign

Focusing on the rural masses was a key strategy for the CCP's success. As early as 1928, Chairman Mao identified the CCP's revolutionary political strategy as using "the rural area

encircles the cities" tactic; that is he concentrated his efforts on rural China and relied on the strength of the rural masses living in the countryside to secure the CCP's political victory (Zhang, 2011; Dobson, 1981; Feng et al., 2017). This campaign also laid a solid political foundation for the establishment of the PRC in 1949 (Yang, 2012).

During China's period of socioeconomic reconstruction, improving healthcare for the rural masses was important to maintain the nation's stability. First, the health campaign provided an effective channel through which the CCP could promote its socialist revolution in rural areas, by simultaneously converting ordinary people's traditional attitudes into socialists' view of science. Second, in terms of national economic development, increasing the health of China's rural population meant they would be able to produce more agricultural output in the countryside that could then be turned into investment for industry (Columbia University, 2009).

The year 1952 was a watershed moment for China's national health policies and public health. The perceived threat of American germ-warfare against China during the Korean War offered the CCP an excuse not only to mobilize the masses but also to strategize for epidemic disease prevention and improvement of sanitation through the launch of the nationwide Patriotic Health Campaign (NHFPC, 2014). All Chinese citizens were called on to participate in this health education campaign. The primary purpose of this initiative was to annihilate the "Four Pests": flies, mosquitoes, rats, and fleas. This would effectively remove conditions from the country that might allow for germ proliferation in the event of an attack. The CCP created large numbers of visual education materials to educate the people about how to prevent the formation of epidemic diseases and their spread via mosquitoes, bugs, rats, flies, and fleas. They hung these materials on walls of work units and community centers and painted them directly on exterior shops walls and homes lining streets. The CCP's public health education initiatives found

effective platforms via public rallies and study groups, where residents learned about the links between diseases and vermin.

This spread of scientific knowledge allowed ordinary people to make significant changes to better health. In the absence of adequate government investment in machinery and professional crews, large numbers of the populace contributed arduous physical labor to change sanitation practices in their work and home environments. At the same time, neighborhood committees organized to convince housewives, retirees, and others to prioritize domestic hygiene. Organized group of women swept streets and did their washing outdoors. The masses were no longer be passive recipients of the government's health work propaganda; instead, they assumed an active role, further contributing to preventive healthcare improvement in China (Rogaski, 2002).

During the same time, health education of China's public also took place in Health and Epidemic Disease Prevention Stations. They were built based on a Soviet model, forming a general prevention paradigm that mainly provided vaccinations in different parts of China. By 1957, 2050 Chinese counties had epidemic prevention stations (Hipgrave, 2011). These stations were expected to offer health education, provide preventive services, control specific diseases (e.g., malaria, plague, and schistosomiasis) and protect people's health. Staffs in these stations were responsible for increasing the health literacy of rural populations, guiding ordinary people to build clean environments, and assisting prevention teams in implementing healthcare activities. Comprehensive health education, sanitation improvement and vaccinations brought about effective disease control around the nation, and even eliminated epidemic diseases like smallpox and plague in certain areas.

3.4 Three Tiers of Rural Healthcare and Improvement of Healthcare Facilities

In addition to launching a public health campaign, building institutional public health and healthcare infrastructure was the other important agenda item for Communists in their nationwide health movement. At the First National Conference of Health, the MOH issued the "Provisional Regulations on the Management of Hospitals and Clinics" that required a hospital and health station to be built in every Chinese county and town, respectively, and also trained and dispatched at least one professional health worker to each village. This construction of the rural health network was similar to the KMT's rural health administration design during The Sino-Japanese War. The establishment of the three-tiered healthcare system in rural areas linked this health network with health service facilities at county, township and village levels. County-level hospitals played a key role in this system because they were responsible for directing and supervising healthcare at different administrative levels.

Further, the central government began to offer universal medical coverage for all government workers and members of political parties and organizations in June of 1952, which had a significant impact on medical facilities construction. The increasing demand for universal medical and preventive services pressured the government to build more hospitals; thus, the number of public hospitals in China sharply increased during this time. By the end of 1952, there were 2,101 county-level hospitals and 7,961 health stations at the town and village levels (Bu, 2017: 230).

3.5 Agricultural Collectivization and Healthcare Facilities

Agricultural collectivization, which was initiated by the CCP in 1951, also contributed to the rapid growth of rural healthcare facilities. Organizing peasants into agricultural cooperatives laid a foundation for the establishment of healthcare systems at the township level and below. Through this system, the central government founded various health facilities – health stations

and also involved local, individual private practitioners to carry out healthcare activities. Specifically, the stations consisted of these independent TCM practitioners where were already organized into self-financed, self-managed for-profit facilities. The stations were established at the township level, received technical support from county hospitals and financed by agricultural cooperatives. Physicians in these stations were members of local collective economies and mobilized the rural masses to improve nutrition, sanitation, water quality and endemic diseases prevention. Local cooperatives were responsible for collecting benefits and assessing physicians' performances within paying "work points" (Feng et al., 2017). By the end of 1957, the number of health stations increased to 60,000 – a massive jump from the 803 that existed in 1950, which employed nearly 200,000 professionals (Qian, 1992). Through this layered structure, namely the tight connection between county hospitals and township level union clinics, healthcare access was improved for many Chinese people; the idea of establishing a hierarchical healthcare system that was first proposed by the Nationalist government in the 1930s was now a reality in the countryside.

3.6 Rise of the Collective Health Insurance Scheme

Though the rural population did not have access to the universal care that was provided by the government in urban areas in the 1950s, they voluntarily created collective medicine programs based on China's rural collective economy. The pioneer in establishing these collective medicine programs was Mishan Town of Gaoping County in Shanxi province in 1955. The town integrated medical services into its agricultural cooperative system to provide unified medical service to farmers (Li, 2015: 53-54). The collective-owned medical cooperative, Mishan Town United Health Protection Station, evolved from a private-owned clinic that was originally formed by ten doctors and three pharmacies in the early 1950s (Bu, 2017: 246). This health station was

supervised by the local town government, and its financial support came from agricultural production cooperatives, farmers, and medical doctors. The agricultural production cooperative offered 15-20 percent of its common fund couple with adding medical income from drug fees as contribution, and each farmer paid 0.2 Chinese currency of health fees to reap benefit of free preventive health service and free medical diagnosis and treatment (Bu, 2017:246-247). Each doctor in this health station was assigned to a particular area in the town and responsible for this area's health and disease prevention. To reduce financial burdens of healthcare on local people, the station encouraged its doctors to plant and collect herbs to make medicines for local consumption (Bu, 2017:247). They hoped to take advantage of TCM to treat the insured in an appropriate, inexpensive way.

The collective health services provided by Mishan town served as a successful example of rural healthcare development by demonstrating how to create a solid organizational foundation for rural healthcare and disease prevention via promoting a socialist ideology and notions of community collectivism. In fact, the Mishan town model caught the attention of national leaders, and the MOH promoted it as a model for villages nationwide in 1955. A year later, in part due to the influence of this collective healthcare model, more than 10,000 health stations were built throughout China, and employed over 100,000 health workers, who were able to provide healthcare for about 10% of rural China (Bu, 2017:247).

3.7 Mao's Directive on Rural Medical and Health Work

In 1965, Mao Zedong emphasized the importance of improving health and hygiene in the countryside and mandated the MOH to shift some of the nation's medical and health work to rural areas. He was critical of the status quo, that the mere 15% of the country's total population resided in urban areas yet received the most benefits from China's existing system of healthcare.

In contrast, the nation's peasant population – over five hundred million people – had little access to healthcare because of the shortage of doctors, healthcare facilities, and affordable medicines (People.cn, 2018). To improve healthcare in rural China, Mao issued the "June 26 Directive" to force the MOH to emphasize health in rural China by providing medical care in villages. Consequently, the MOH dispatched one-third of the country's medical staff, health professionals, and healthcare administrators to the countryside to improve hygiene, train general practitioners to serve rural population and provide basic, appropriate healthcare to millions of rural people (Cao & Liu, 1992). These urban healthcare personnel innovated and improved rural healthcare and helped establish the "Barefoot Doctor" program, which emphasized preventative care, community-based interventions and public health education.

3.8 The Barefoot Doctors Program and Primary Care

1968 in China marked the initiation of a massive primary care movement in rural China that helped further develop the country's primary care system. Due to the influence of revolutionary socialism being spread nationwide, the nucleus of this movement was the Barefoot Doctors program in Chinese villages. Through this program, rural medical practitioners combined a new method of TCM with Western medicine and introduced this new model to advance medical treatment in rural China.

The CCP rolled out the idea of the Barefoot Doctors program via newspaper articles. On September 14, 1968, an investigative report titled "Fostering a Revolution in Medical Education through the Growth of the Barefoot Doctors" describing the work of barefoot doctors in the Shanghai municipality of Chuansha county was published in the *People's Daily*, an organ of the Central Committee of the Chinese Communist Party (Li, 2018; Andrews & Bullock, 2014:267). The same year, the *People's Daily* also released an article with the headline "Cooperative

Medical Service Warmly Welcomed by Poor and Lower-Middle Peasants" that praised the new cooperative medical services of the Leyuan commune, in Changyang county, Hubei Province (Wang, 2008). Because this article labeled the Barefoot Doctor as an innovative force of medical reform during the Cultural Revolution, these health practitioners became and were viewed as revolutionary actors in the service of CCP's propaganda (Li, 2015). They epitomized the Maoist aim of medicine that "serves the people" and embodied the CCP's political ideologies and rural development strategies in China. They were promptly popularized around the country and expected to make healthcare more equitable and affordable for rural populations (Gross, 2018).

To meet the demand for medical care in rural areas, the Barefoot Doctors program was conceived to train local party officials and young peasants in an inexpensive, quick way to function as "real" doctors in accordance with local needs. However, they were not alone in building this program as numerous urban medical experts and cadres were sent to bring professional medical knowledge and skills to the rural areas for political re-education after being assigned an "unreliable political label" during the Cultural Revolution. Concurrently, Mao also forced educated youth from both the civilian and the military to serve in rural areas. Because of their comparative advantages in literacy and education, these groups were expected to permanently work as rural doctors, largely functioning as a prime source of manpower for the Barefoot Doctors program.

Generally, the structure of the Barefoot Doctors program evolved in line with the national sociopolitical system and local community needs. The basic national health plan required at least one hospital bed per 1,000 people, one doctor per 1.3 hospital beds, and one barefoot doctor per 500 people (WHO, 1983). The number of barefoot doctors fluctuated during the period between 1968 and 1981. There were approximately one million barefoot doctors between 1968 and 1970.

By 1975, there were 1.5 million doctors in China, and they served more than 500 million rural people (Cao, 2006).

3.9 Barefoot Doctors' Training and Responsibilities

The healthcare workers recruited for the Barefoot Doctors program were organized to participate in intensive three to six-month courses in TCM and Western medicine, preventive medicine, clinical medicine, and socialist political ideology before being sent to practice medicine. Participating with them were three types of local people: those with some general education, those born into a medical family, and those who were funded by local production brigades.

These intensive training programs intentionally focused only on basic courses. Initial training mostly occurred at Commune Health Centers (CHC), where medical teams from county hospitals were dispatched to teach medical skills in areas like anatomy, bacteriology, disease diagnosis, acupuncture, TCM and Western medicine prescription, birth control, and maternal and infant care. Through these courses, trainees were expected to learn how to provide basic primary care services and treatment methods to then bring back to their home villages. The short-term training could last six months to one year, depending on a trainee's aptitude. Evening tutorials and self-instruction were complementary to the initial courses. Once the initial training was over, these fledgling doctors began to offer basic medical treatment for their communities. These doctors' main tasks included controlling the spread of contagious diseases and lowering the infant mortality rate. These doctors were organized into China's Cooperative Medical Scheme and employed by brigade-level health stations.

Due to their lack of systemized knowledge, these inexperienced doctors relied heavily on in-service training at the Brigade Health Stations, which offered continuing education. This continued training was led by more sophisticated barefoot doctors or periodic supervisory visits from medical personnel of the CHC. In addition, the CHC held regular group discussions once every 10-20 days for barefoot doctors on topics of need or special interest. Moreover, county facilities such as the County Hospital, the Epidemic Prevention Station, and the Maternal and Child Health Station designed and offered special training courses for barefoot doctors to tackle emergent epidemic situations.

The highest-level healthcare education barefoot doctors received was provided by the County Health Training Center, which was well-staffed and equipped with libraries and laboratories. Based on national guidelines, the Center designed training courses to cover a wide range of topics, including politics, basic medical sciences, traditional medicine, and clinical medicine (WHO, 1983).

As the essential force in China's rural, three-tiered healthcare delivery system, barefoot doctors were responsible for treating common diseases; cultivating, collecting, and processing medicinal herbs; offering immunization and health education; providing maternal and child healthcare in general; collecting information on epidemics; improving sanitation in wells, toilets, and livestock areas; implementing state hygiene principles and policies; and encouraging people to participate in Patriotic Health Campaigns. Because the State could not afford to fund large amounts of medicine and equipment, barefoot doctors heavily relied on TCM for medical treatment because it was cost-effective and generally safe. They primarily prescribed herbal medicine and offered basic, traditional Chinese treatments such as acupuncture, cupping therapy, and massage to treat their patients.

3.10 The Impact of Barefoot Doctors

Before the Cultural Revolution, many peasants refused to go to the hospital and thus medical encounters mainly occurred in patients' homes. The absence of coordinated treatment often resulted in rural peasants not receiving professional and appropriate medical treatment. The emergence of barefoot doctors and medical service stations at the local level thus brought positive changes for many rural people. In medical service stations, barefoot doctors not only provided good, timely treatment and healthcare services for patients but also tutored rural peasants about common diseases and ways to improve their living environments. More importantly, some of these doctors' services and medicines were free of charge because they were funded by local collective welfare funds. Within the Cooperative Medical Scheme, local people paid annual membership fees that were generally equivalent to less than 3% of a family's income (Zhu et.al, 1989). All participants would receive total or partial reimbursement of medical expenses if they were ultimately referred to township or county level medical facilities by a barefoot doctor. This community self-reliant system facilitated substantial change in how rural populations had medical encounters and received treatment.

Critical to transforming the medical practice system at the community and country level were the establishment of both the Barefoot Doctors program and medical service stations. This coordinating mechanism for the rural hierarchical medical system among county, commune, and brigade extended the top-down medical system into a three-tiered system. In this new system, barefoot doctors played various roles: they encouraged rural peasants to leave their homes and access new medical services in a modern medical setting; they conducted primary care activities; and they referred serious patients to upper-level medical stations, usually health centers at the commune level or county hospitals (Henderson & Cohen 1984:107). In addition to being

responsible for preventing epidemics and referring patients to higher-level medical centers, the doctors made healing a part of their routine care. They also used their own medical stations and supplies. They functioned as physicians in taking over rural medical practice. In these ways, their multiple roles contributed tremendously to the structural evolution of China's rural three-tiered medical network.

Moreover, because of the effect of the Barefoot Doctors program, grassroots patients and medical practitioners were ultimately integrated into the rural three-tiered medical system. In this hierarchical medical system, rural medical practitioners easily collected patients' medical information and supervised and promptly reported endemic diseases. Patients had improved access to receive a professional and high-quality medical service without the high costs.

3.11 Learning from the Barefoot Doctors Program for Future Healthcare System Development

What lessons can the Barefoot Doctors program provide for China as it attempts to rebuild a strong, community-based primary care system and achieve the vision set forth in Healthy China 2030? Some of the factors that helped the Barefoot Doctors program gain a foothold and advance population health in the latter part of the 20th century are replicable today, while others are not.

The program was successful in part because the barefoot doctors were fully integrated into their communities: they were nominated by, paid by, and trained in their communities. Barefoot doctors' restricted opportunities for career path promotion and their low migration flows were also important factors in the successful implementation of the Barefoot Doctors program. To ensure local healthcare services would be available in rural communities in a

sustainable way, the state did not establish systematic means of career development for the barefoot doctors. There were no methods by which barefoot doctors could upgrade from their communities to the upper level—town or county level. Barefoot doctors were further prevented from transferring from one brigade to another. This government-blocked social mobility ensured that the doctors would serve as stable healthcare providers within their communities. In their own villages, they would be familiar with the cultural and social topographies of their brigades and able to interact with their patients on a daily basis. In this way, they could meet the healthcare needs of their localities with limited additional resources. Because of their ability to treat patients in a timely manner and due to their close relationships with local villagers, barefoot doctors earned the trust and respect of their patients and received support from them. Patients were willing to share their unique needs, cultures, values, and preferences with the doctors, which further helped these doctors recognize their communities' individual medical needs and establish unique healthcare plans. In addition, because of the efficacy of the treatments these doctors offered, patient distrust in medical treatment gradually faded. The proximity of healthcare at community level helped avoid the patients' need for higher-level care and self-referral in the rural three-tiered healthcare system. The bottom-up migration flow of patients was low, which ensured that community healthcare services were adequately and effectively used.

The remuneration system also contributed to the effective implementation of Barefoot Doctors programs. Barefoot doctors were not put on the state payroll. As members of local brigades, they were subject to a system of remuneration in "work-points," meaning that they received their regular salaries (work points) from the collective economy. Without the state's financial support, local brigade peasants voluntarily organized welfare funds to establish and run local cooperative medical service stations on the basis of collective self-reliance. The barefoot

doctors were responsible for operating these medical service stations and provided certain services and medicines free of charge. Therefore, these barefoot doctors had no financial incentives to over-treat and over-prescribe, problems that may exacerbate healthcare quality issues. Instead, they provided cost-effective health promotion and disease prevention services to their communities. They emphasized primary care services like physical examinations, health screenings, and activities aimed at reducing risk factors. By reducing risk factors, they reduced the prevalence of infectious diseases and increased life expectancy, thereby further relieving the financial burden of healthcare rural populations.

The political power associated with the barefoot doctor was important to achieving effective delivery of primary care. To build state power in China's rural areas during the Cultural Revolution, Mao envisioned the barefoot doctor as a symbol of the state political ideology who could popularize the party ideals in serving the people and building party loyalty. Barefoot doctors were generally brigade members who were nominated by brigade leadership, which played a critical role in improving the social status of the barefoot doctors in geographically isolated villages; it was what enabled villagers to quickly develop medical trust about these healthcare personnel. As one of the major forces of Mao's strategy in healthcare reform, barefoot doctors were promptly introduced by the state government and integrated into the reshuffled and reorganized healthcare networks in rural villages. Thus, the state not only placed barefoot doctors at the center of the new rural healthcare system but also facilitated their ascendance to positions of power within their communities.

The political power bestowed on barefoot doctor further informed physician-patient medical encounters in rural communities. The power imbalance between barefoot doctors and their patients quickly shaped the respect that villagers held for these healthcare providers and

defined community medical interactions. Villagers' political faith in socialist medicine made them believe that a cadre of primary care physicians who were nominated, trained, and dispatched by the state were an effectively functioning medical team in the provision of quality healthcare. The barefoot doctors earned respect and trust from patients who did not have the freedom to challenge these state-authorized healthcare providers.

The downward reallocation of medical resources gave barefoot doctors opportunities to learn professional skills from healthcare personnel who came from tertiary or secondary hospitals in urban areas. In geographically isolated rural villages, the barefoot doctors were distinguished by their professional medical skills and generally identified as a new group of healthcare providers quite different from their would-be competitors, such as religious and supernatural healers and practitioners of indigenous herbal medicine. Barefoot doctors were distinguished because of their professional training in both Chinese and modern Western medicine and because they received political protection from the state. Due to their elevated status, barefoot doctors consciously set themselves apart from folk healers, uniting to form a new professional medical group. As barefoot doctors dramatically increased in number, these competing folk healers were gradually marginalized and ultimately eliminated. This workforce transformation radically improved the quality of healthcare delivery and systematically reformed the rural healthcare system throughout China. The improved availability of professional medical services increased patients' medical confidence, and barefoot doctors, with their state-sanctioned professional skills, became the exclusive healthcare providers that patient trusted.

3.12 Grassroots Primary Care Workforce

In addition to barefoot doctors, numerous volunteers such as health aides, sanitation area leaders, women's leaders, family planning promoters, and schoolteachers performed

complementary roles to help carried out primary health activities at the team level – in brigades, with more than one production team.

The health aid was a member of a local production team and selected by the team to provide first-aid services to their team members. Their training was under the guidance of the barefoot doctors, conducted informally at the Brigade Health Station and lasted roughly 4 weeks. There was usually one health aide in each production team. Supervised by barefoot doctors, health aides were also responsible for assisting the doctors in delivering primary health care and promoting Patriotic Health Campaigns among members of the production team.

Next, the main responsibility of sanitation area leaders was to supervise environmental health activities and sanitary conditions within their production team's geographical area. As members of Brigade Sanitation Sub-Committees, they frequently inspected streets, compounds, and houses to make sure cleanliness standard were met and to educate violators to comply with team regulations. They were also responsible for reinforcing the efforts of other health workforces and promoting maternal and child health and family planning. In addition to sanitation area leaders, family planning promoters helped with family planning services. They used methods inspired by the ones used by barefoot doctors and maternal and childcare experts from the Commune Health Center.

Also assisting in these efforts, the brigade women's leader's main task was to make sure women had equal rights and to provide consultation and assistance for women's health related to their "The Four Periods": menstruation, pregnancy, post-partum, and lactation.

Teachers at schools also provided basic hygiene consultation and education for their students. Barefoot doctors and Commune Health Center staff offered basic hygiene and health

training for these teachers, who, in turn, collaborated with the doctors and the maternal and child section of the Commune Health Center to record children's health conditions in individual case folders.

Other volunteers including street cleaners, manure collectors, and individual family members participated in promoting primary health and sanitation in local communities. The Patriotic Health Campaigns influenced these people and spurred their awareness of the need to control diseases, improve sanitation conditions, and eliminate injurious insects.

3.13 The Cooperative Medical Scheme and the Rural Three-Tiered Healthcare System

The development of China's three-tiered healthcare system depended on the establishment of the CMS, the basic organizing structure of rural healthcare, and the provision of primary care services through the barefoot doctors at the brigade level. These two programs enabled peasants to support themselves collectively in receiving basic healthcare in their isolated communities. The CMS also helped alleviate the problem of inadequate healthcare in rural areas by introducing a relatively inexpensive, technologically simple health services so that rural populations could avoid expensive hospital care. Through the countryside's collectivistic economy and the organization of barefoot doctors and local volunteers in the CMS, healthcare steadily became an integral part of local socioeconomic development via the focus on healthcare that this organization successfully promoted at the grassroots level.

Within this scheme, local peasants paid annual membership fees that were generally equivalent to less than 3% of a family's income (Zhu et.al, 1989). All participants would receive total or partial reimbursement of medical expenses if they were ultimately referred to upper level medical facilities by barefoot doctors. Without referral, the CMS would not take care of any

medical bills; patients who directly went to these medical units must pay the full expenses themselves. The CMS played the dual role in collecting insurance funds and supplying medical reimbursement. It also facilitated integration of healthcare personnel and patients into rural three-tiered healthcare system and standardized patients' referral process in this network.

As barefoot doctors established the rural healthcare system at the brigade level, this system was eventually integrated with other administrative levels in rural areas – the commune and the county – to ultimately from China's new rural three-tiered healthcare system. Each level of the system was interconnected to the level paralleled to it in the decentralized government system (WHO, 1983). Three functions – administrative leadership, technical supervision, and patient referrals – were combined at each level. One of the critical features of this three-tiered healthcare system was the large scale of supervision and technical support that the lower levels obtained from the higher levels.

3.13.1 Brigade Levels

The brigade level usually consisted of about 1,000 to 2,000 residents and represented the first level of contact between the community and the health system (WHO, 1983). Each brigade roughly employed 2 to 3 barefoot doctors to provide both basic preventive and curative care services, as well as first aid in the Brigade Health Station. Barefoot doctors spent most of their time in this health station, providing care or doing clerical work. During the harvest time, the doctors occasionally offered home visit service and accompanied farmers into fields to provide first aid. For more serious medical cases, they referred patients to the upper level: The Commune Health Centers.

Health information collection was the other important task for the brigade level barefoot doctors. The records of an individual patient health condition, a chronological register of patient visits, and family census, immunization, and death records were simply documented by barefoot doctors in the health station. Little data and information analysis were conducted at this level, but the doctors did collect this basic information and submit it along with quarterly mother and child health/vaccine records and fiscal statements to the Commune Health Center for further statistical review (WHO, 1983). In addition, the brigade level was also responsible for reporting any notable diseases or emergency epidemics to the commune level.

Although healthcare personnel in Brigade Health Station heavily relied on technical support from the Commune Health Center, the health station received no financial subsidies from this upper level. Instead, the station was constructed, staffed, and managed on the local collective economy. In other words, the healthcare system at the brigade level was financed through three main sources: a collective fund of the brigades, resident salaries, and subsidies from the central government (Zhu et al., 1989). Healthcare costs in a particular geographic area thus entirely depended on a brigade's wealth and agricultural output. As a result, the number of barefoot doctors varied from village to village based on each brigade's economic status. A wealthy brigade would likely have more doctors and better medical services and medicines.

3.13.2 Commune Levels

The second-tier level of China's rural healthcare system was the Commune level, which generally focused on medical care, community health, and general services, as the Commune Health Center demonstrated. The center was staffed by physician assistants, health aides, and general service workers and had roughly 10 to 30 beds to serve 10,000 to 50,000 people (Zhu et al., 1989). Its function was three-fold: medical care, community health, and general services.

Further, the center's responsibilities ranged from patient services to epidemic prevention and technical supervision. As the middle level of the three-tiered healthcare system, the center accepted referrals from the brigade level and referred more severe medical cases to the County Hospital. When the communicable diseases occurred, the Commune Health Center was responsible for submitting an immediate report to the county level.

Moreover, a large amount of information collection and transformation took place in the center. Information on the CMS, expenditure and income, staffing, and workload were recorded on standard forms and sent quarterly to the County Health Department. Statistical reports on inpatient and outpatient services and information on maternal and child health was also transmitted to the County Health Department and the County Maternal and Child Health Station every six months, respectively.

The center received technical supervision and financial and staffing supports from the county level. Unlike the bridge level, it could not fully rely on the local collective economy to fund its operation. Because the center received annual financial allocation and various types of subsidies from the upper level, it was administratively accountable to both the Commune Management Committee and the County Department of Public Health (WHO, 1983).

3.13.3 County Level

The county level was at the top of the three-tiered health care system. The types of service and expertise at this level were more complicated and sophisticated than those at the commune level and brigade level and were provided by various health and medical institutions including the County People's Hospital, the County Epidemic Prevention Station, and the County Maternal and Child Health Station. The County hospital was staffed by fully qualified

healthcare personnel to serve 200,000 to 600,000 people (Zhu et al., 1989). With the support of the large amount of medical personnel, medicine, and equipment, county level institutions were able to provide high-quality healthcare and offer technical guidance and support to the commune and brigade levels. The Department of Public Health was the primary institution supervising and promoting health services at this level, which existed under the technical supervision and support of the Prefectural and Provincial Bureau of Public Health.

Health information obtained from the Commune Health Center was collated with that from the County Hospital, Maternal and Child Health Station, and Epidemic Prevention Station by the County Health Department (WHO, 1983). It was biannually submitted to the County Government Office and the Prefectural Public Health Bureau.

Within this three-tiered healthcare system, the lower levels received technical support, consultations, and professional guidance from the upper levels. As such, this system facilitated the transmission of health information and the referral of patients with certain medical problems from the brigade level to the commune and county levels. Ultimately, these interactions between the three levels of the healthcare system illustrate that the three levels were closely associated and functioned together to provide medical care to rural patients during China's Cultural Revolution.

3.14 The Collapse of Collectivism and the Barefoot Doctor Program

1978 was the turning point for the Barefoot Doctors program. With the development of national health policy and implementation of rural economic reform policy, barefoot doctors were expected to improve their expertise and medical proficiency. In October of 1979, the State Council proposed holding examinations to certify barefoot doctors to enhance the quality of the

CMS (Rosenthal & Greiner, 1982). The status upgrading started in 1981. A “Rural Doctor’s Certificate” was awarded to barefoot doctors with 5 years’ experience who passed this examination. In this way, their professional status was raised to that of middle-level health workers such as doctor assistant, nurse, pharmacist assistant and midwife. Those who failed the examination could merely continue to be health workers and practice under the guidance of village doctors (WHO, 2008).

Following the Cultural Revolution in China, the rural economic reform and a new Household Responsibility System resulted in de-collectivization and fragmentation of the commune system. As the collective economy gradually transformed into a private economy in rural areas, the CMS ceased to exist. The rural cooperative medical system was promptly replaced by a user-pay system. The percentage of villages with a CMS fell from 90% in the 1960s to 5% by 1985 (Zhang & Unschuld, 2008). Simultaneously, the collapse of the cooperative medical system led to the dismantling of numerous medical stations, while others were run as private clinics by former barefoot doctors. As private practitioners, these remaining barefoot doctors began to focus on treatment of diseases for the purpose of economic benefit at the expense of providing affordable, accessible primary care in villages. Although the barefoot doctors could earn a living on a fee-for-service basis, they could not receive any further medical training within the three-tiered healthcare system. Without constitutional and institutional support, the number of barefoot doctors dramatically decreased. As a result of the transformation of China’s economic structure during this time, more and more barefoot doctors devoted their time to farming, simply because it was more lucrative. The reduction of practicing barefoot doctors and the lack of available collective funds increased financial burdens on rural population. In turn, rising costs of medical service prevented substantial numbers of patients from seeking

needed treatment. Collapse of the cooperative medical system and the changing, now-limited role of barefoot doctors led to a huge decline in primary and curative healthcare coverage in rural areas. In 1985, the state government officially announced that the term “barefoot doctor” would no longer be used in China and began to advocate the professionalization of medical personnel.

Although the decline of barefoot doctors had serious, negative consequences for both healthcare providers and consumers in rural China, the new medical proficiency standards established during China’s institutional reform era were important for both the state and the barefoot doctors. This reform motivated barefoot doctors to upgrade their professional skills and thereby meet the qualifications of “real” doctors who could provide high-quality medical services for local people. This escalation in expertise could clearly shape barefoot doctors into professional medical personnel with specialized knowledge, thus further consolidating their high social status among their fellow villagers. Therefore, the medical examination and group differentiation of doctors that occurred during this time was positive in that it influenced the professionalization of barefoot doctors.

3.15 Conclusion

The Communists’ efforts in epidemic disease prevention and sanitation improvement began in the 1950s via policy changes and the implementation of practical initiatives. Health workers concentrated on fighting major epidemic diseases, improving population health, and taking care of the rural people who did not have access to medicine. Given the shortage of financial resources and health facilities and personnel, the government was unable to build a nationwide system of advanced medical and health facilities. As such, implementing primary care activities was considered as an appropriate alternative method for the government to improve national healthcare and, in turn, to develop China’s economy. Special health programs

like the Patriotic Health campaign helped achieve these goals by mobilizing the masses to participate in preventive healthcare efforts.

The Barefoot Doctor program was a landmark event in the long-term historical development of rural health and medicine in China and has been regarded, both inside and outside of China, as "a low-cost solution built around easily available indigenous medicines" (Sidel 1972, 1292-1300). The program was integrated into national health policy in 1968, though the "Barefoot Doctors" title was officially abolished in 1985 with the end of the nation's commune system of agricultural cooperatives.

To answer Mao's mandate to "stress rural areas in medical and health work," urban medical experts and young people were dispatched to establish rural medical networks and provide medical services in rural China. Without the support of drugs and equipment, these healthcare workers – barefoot doctors primarily had to use "one silver needle and a bunch of herbs" – a reference to acupuncture and Chinese herbal medicine – to provide medical treatment and primary care services. The basic health indicators have been distinctly improved under this program. And by the late 1970s, the WHO promoted the Chinese system as a model of primary health care for developing countries around the world (WHO, 2008).

Integrating Barefoot Doctor programs into rural communities was not only a top-down process relying on the enforcement of the highest political mandate, but also a bottom-up process of acceptance and adaptation. The rural people acclimated to the transformation of healthcare providers from "old things" to "newly emerged things" during the Cultural Revolution, during which they also experienced an impressive shift in their healthcare activities and underwent important changes as citizens and patients. Political forces were significant factors in these changes. The national government enhanced the social and economic status of the barefoot

doctors in a geographically contained society; as such, villagers quickly formed medical beliefs about these healthcare personnel. The establishment of the Brigade Health Station greatly expanded the scope of villagers' medical encounters. Because of medical institutionalization, the establishment of cooperative medical system and the formation of a socialist medical profession, villagers developed a relatively equal relationship with their healthcare providers in the enclosed communities of their home villages. These initiatives ultimately strengthened the doctor-patient relationship.

The barefoot doctors, together with grassroots primary care workers in rural China, constituted the bottom (or "brigade level") of the rural, three-tiered healthcare system underneath the commune and county levels. Because of the provision of primary care at these levels, health conditions were significantly improved during the Cultural Revolution, leading to the reduction of infectious disease and increased life expectancy. However, the CMS was closely linked to the planned and collective economy, and as China converted to a market-based economy, the country's rural medical system eventually collapsed. Without the CMS, barefoot doctors lost their institutional and constitutional support. They began spending more time farming and less on providing healthcare. The commercialization and marketization of medical provisions further lowered the accessibility, affordability, and equity of medical care in rural China (Duckett 2010:6-7). In the 1980s, China's medical care gradually began to occur primarily in urban hospitals, where health workers had better training; patients thus sought care in these hospitals for its high-quality healthcare service. As a result, rural health care was pushed back to square one.

CHAPTER 4

DENG XIAOPING'S MARKET-BASED ECONOMY AND ITS UNINTENDED CONSEQUENCES FOR PRIMARY CARE (1978-2009)

4.1 Introduction

Following Mao's death in 1976, Deng Xiaoping quickly rose to power in the CCP and began impacting China's policies. In 1977, Deng made clear that his policy-making ideology was different from Mao's; Deng prioritized science and placed a high value on professionalism. To this end, Deng emphasized the importance of academics, and he considered scientists to be critical for the country's economic development and international standing. His reform philosophy gained support in the party and was widely accepted by 1978, marking a turning point in the development of China's economic and social development policies (Tisdell, 2008).

Based on Deng's emphasis on professionalism, barefoot doctors were expected to improve their expertise and medical proficiency. In October 1979, the State Council proposed holding examinations to standardize and certify barefoot doctors to enhance the quality of the nation's healthcare services (Rosenthal & Greiner, 1982). These reforms greatly increased the status of rural doctors, whom Deng incentivized in numerous ways. For example, in 1981, a "Rural Doctor's Certificate" was awarded to barefoot doctors who had five years of healthcare experience and passed the examination. In this way, their professional status was raised to that of middle-level health workers, such as physician assistants and nurses. Those who failed the examination could merely continue to serve as low-level health workers and practice under the guidance of the village doctors (WHO, 2008).

These reforms under Deng motivated barefoot doctors to upgrade their professional skills to meet the qualifications of "real" doctors who could provide high-quality medical services. Their increase in expertise shaped them into Deng's vision of professional medical personnel with specialized knowledge, in turn further elevating their social status among fellow villagers.

Even as barefoot doctors increased their skills and status, the system in which they practiced was rapidly deteriorating. Deng's economic policies decentered agricultural communes in favor of a household responsibility system. Indeed, these shifts resulted in the de-collectivization and fragmentation of China's commune system and ultimately the end of the people's communes. This effectively eliminated the Cooperative Medical Scheme in rural areas, which, in turn, destroyed the commune-based healthcare network for rural residents. As the rural healthcare system was replaced by a fee-for-service system, the percentage of villages with a cooperative fell from 90% in the 1960s to 5% by 1985 (Zhang & Unschuld, 2008), leaving 900 million rural people uninsured and responsible for paying their medical bills directly (Yip & Hsiao, 2015). The collapse of cooperative financing in many areas further led to the dismantling of medical stations in rural villages. Others were transformed into private clinics run by former barefoot doctors who, as private practitioners, began to focus on providing treatment for their own economic benefit. The reduction of barefoot doctors and the lack of available cooperative funds to support healthcare in rural communities increased the financial burden of medical services on China's rural populations. High medical costs prevented substantial amounts of would-be patients from seeking needed treatment. Together, the collapse of the Cooperative Medical Scheme and the decline and change in the role of barefoot doctors led to a decrease in both primary and curative healthcare coverage in China's rural areas.

Ultimately, under Deng, China's collectivized, prevention-focused healthcare system transformed into an individually-based, privately-owned, fee-for-service, and specialty-focused system, thus significantly and negatively affecting the provision of healthcare throughout the country (Burns & Liu, 2017). The commercialization and marketization of healthcare destroyed both the commune-based healthcare network for rural populations and enterprise-based healthcare networks for urban residents, consequently leading to a large portion of the population being uninsured. In effect, this healthcare transformation in China undercut the improvements made to the nation's healthcare system under Mao, namely accessibility, accountability, affordability, and equity in rural healthcare.

The changes in China's national medical practices under Deng also had a significant impact on the provision of preventive and public health services. In China, preventive and public health services were financed by government and provided by anti-epidemic stations at the province, prefecture, and county levels, as well as by township health centers and village clinics (Eggleston et al. 2008). As these healthcare providers gradually became profit-seeking entities, they focused on delivering specialty healthcare services, adopting high-tech diagnostics with generous margins, and over-prescribing profitable drugs rather than emphasizing primary and preventive healthcare activities such as healthcare education, immunizations, epidemic control, and maternal and child health, since these activities were considered as public welfare and non-profitable (Hsiao, 2014; Eggleston et al., 2008). The decreases in primary and preventive healthcare services and activities ultimately slowed China's progress in improving population health and even resulted in the resurgence of some infectious diseases (Liu et al., 2014).

4.2 Healthcare Provision and Consequences of an Inappropriate Incentive System

The shortage of government subsidies, distorted prices scheme, and emphasis on fee-for-services payment had profound impacts on the provision of healthcare in China. Following the government liberalizing its economy beginning in 1978, its revenue as a percentage of GDP dropped from 30% in 1978 to merely 10% in 1993 (Naughton, 2014). Because of this fiscal crisis, the government cut down its outlays on healthcare services significantly; for instance, subsidies for public health facilities fell from 50% to only 10% of the facilities' total revenues by the early 1990s (Yip & Hsiao, 2008). Further, government funding of healthcare shrunk from 39% of national health spending in 1986 to 16% in 2002 (Huang, 2014). Local governments at the provincial and county levels were required to take greater responsibility in financing healthcare providers to ensure provision of important public health programs in their areas. Most of this funding was directed to major capital investments such as healthcare facilities, hospital beds, and medical equipment, leaving only 25-30% for medical professionals' salaries and other hospital operation costs (Burns & Liu, 2017:43). The national funding compounded these problems by setting low regulated prices for personal basic healthcare services such as physician visits, surgical procedures, and hospital daily beds, with the aim of ensuring that virtually all people could access healthcare (Yip & Hsiao, 2008; Eggleston et al., 2008; Yip et al., 2010). While these regulated prices were well intended, in actuality they meant that patients had an economic incentive to remain in the hospital for long periods of time. Longer average hospital stays reduced bed turnover and impeded other patients' access to healthcare, thus affecting the clinics and hospitals' incomes. Moreover, because hospitals were insufficiently financed, physicians were poorly paid. Average earnings in China's regulated health sector rank ninth among all sectors, only 13 percent above the economy wide average. Thus, they regularly accepted the bribes (known as "Red Envelopes") from patients seeking to ensure they received high-quality

services and desired outcomes, and kickbacks from drug companies and medical suppliers who wanted to promote their drugs and other products (Burns & Liu, 2017: 44; Yip et al. 2010). Ultimately, though the government built the hospital infrastructure, but these hospitals had responsibilities for their own profit and loss.

Out-of-pocket expenses from patients and fee-for-service payments from insurers were considered considerable sources of financing for hospitals seeking to fill their large fiscal gaps, and in fact accounted for 90% of hospitals' incomes. To this end, public health clinics and hospitals relied on selling extra services such as medicines, imaging, and laboratory tests and charging higher fees for such services. Further, to compensate the revenue shortfall from low regulated service prices such as co-pay and hospitalization fee, the prices of high-technology diagnostics were set way above production costs, and the national government allowed a 5% mark-up for high-technology procedures (Hougaard et al. 2011). A margin was also added to drugs sales; specifically, the mark-up was 15% for Western medicine and 25% for Chinese medicine (Eggleston et al., 2008). The distortion of such prices incentivized healthcare providers to conduct high-tech diagnostic tests and overprescribe drugs for their patients, because these markups were so important to hospital operations as they regularly accounted for up to 50% of hospitals' revenues and, in many cases, 90% of profits (Daemmrich, 2013). These increased operating funds also allowed the public clinics and hospitals to retain their medical personnel by providing higher salaries and bonuses. Cumulatively, these policies created perverse incentives, in turn significantly changing the motivations and behaviors of hospitals managers and practitioners (Eggleston et al., 2008; Yip et al., 2010).

The public clinics and hospitals' profit-making behaviors were formally legitimized in 1992, when the State Council issued a document titled "Deepening the Reform of the Medical

and Healthcare System," which encouraged the hospitals to "rely on themselves to eat" through directly charging patients and operating income-based sideline services besides regular medical services (Yip & Hsiao, 2015). With this increased autonomy to reap fiscal benefits, public hospitals also began to open supplemental health care sites such as "special attendance" and "special wards" to increase their revenues by charging higher specialty service fees in these spaces. Collectively, these profit-making activities of healthcare providers led to a lot of new entry; for example, the number of healthcare-providing units across the country rose from 180,000 in 1980 to 320,000 in 2000, which had the positive impact of diminishing some of the barriers to accessing high quality care that patients demanded while simultaneously making healthcare more lucrative for the providers of procedures and testing (Burns & Liu, 2017: 44).

The increase of healthcare institutions' operating costs and margins attributed to growing pharmaceutical sales in China, which increased 600% between 1985 to 1994 (Burns & Liu, 2017: 44). In 1989, 45% of China's total healthcare spending was for pharmaceuticals, much higher than in other countries. By contrast, in the United States, drug spending as a percentage of national health expenditures was less than 10%, and only 15-40% in other developing countries (Burns & Liu, 2017: 44). Drug sales were an even more important source of funding for China's rural health institutions, where healthcare personnel were often insufficient and surgical procedures and diagnostic testing were less available. Many healthcare providers around the country overprescribed drugs and introduced expensive imported drugs, from which they could receive higher profit margins and kickbacks from pharmaceutical manufacturers. More than 90% of market-priced drugs carried a commission, implying that healthcare providers were able to choose maximum commission drugs among those with the same treatment effects (Hougaard et al. 2011). In addition, these healthcare providers did not face much retail competition in the

market and could easily capture the price spread between wholesale and retail prices, which they thus considered important income generators (Daemmrich, 2013).

Expensive imported drugs, cutting-edge tests, and sophisticated facilities were perceived as high-quality healthcare services by a large number of people in China, especially in rural areas. Rapidly growing economic conditions throughout the country fueled, demand for high-quality healthcare services, as did increased farmer and household incomes. However, their increased expectations for quality of healthcare often exceeded what traditional rural healthcare facilities could provide, as financial constraints restricted their ability to offer high salaries and bonuses for high qualified medical personnel and to purchase advanced testing equipment. Rural populations became dissatisfied with the healthcare services that village clinics and township healthcare centers provided, because of the absence of said cutting-edge equipment and professional healthcare workers. Although the MOH raised the professional levels of rural medical personnel by tightening screening criteria and regulatory oversight, like through certification and credentialing of private physicians and barefoot doctors that ensured these healthcare workers were well-trained, reliable, professional and able to treat basic diseases, patients still questioned their quality. Hence, many patients bypassed the traditional rural referral systems and went directly to county-level hospitals or even higher to seek specialty services, despite having to pay higher out-of-pocket expenses. Such medical care seeking behaviors increased both inpatient visits and outpatient visits at higher level (e.g. provincial and county) hospitals, in turn generating long waiting lists at them while simultaneously leaving lower level (e.g. township) hospitals under capacity. Patients self-referring to the best quality of healthcare provider they could afford effectively, destroyed the rural referral system and reversed the

progress made during Mao's healthcare revolution in sending practitioners to the rural communities and providing basic healthcare for rural communities.

Incentives to over-treat and over-prescription exacerbated quality issues of healthcare. Over-treat and over-prescription not only increased healthcare expenditures, but also harmed patients with adverse reactions from the over-use of drugs, microbial resistance from the use of multiple drugs, and the rise of superbugs (Yip & Hsiao, 2008; Yip et al. 2010; Li et al. 2012; Burns & Liu,2017:54). According to a survey, sixty-two percent of patients received antibiotics and roughly 39% were still prescribed antibiotics even when they expressed concern over their inappropriateness (Burns & Liu,2017:53-54). Similarly, 75% of patients with symptoms of the common cold were prescribed antibiotics, more than double the international average of 30% (Yip & Hsiao, 2008). From 1978 to 2011, personal health spending per capita in China increased from roughly $6 to $280. A huge portion of this spending was on high-tech tests and unnecessary drugs; in fact, about half of Chinese healthcare spending at this time was devoted to drugs, compared to only 10% in the United States (Hsiao et al., 2014). Moreover, over-treatment and over-prescription fostered patient distrust of physician motives, and thus led to additional problems of under-compliance and under-diagnosis of disease (Eggleston, 2014).

4.3 Diminished Emphasis on Preventive Care and Public Health Services

The changes in China's national medical practices under Deng also had a significant impact on the provision of preventive and public health services. In China, preventive and public health services were financed by government and provided by anti-epidemic stations at the province, prefecture, and county levels, as well as by township health centers (THCs) and village clinics (Eggleston et al. 2008). As these healthcare providers gradually became profit-seeking entities, they focused on delivering specialty healthcare services, adopting high-tech diagnostics

with generous margins, and over-prescribing profitable drugs rather than emphasizing primary and preventive healthcare activities such as healthcare education, immunizations, epidemic control, and maternal and child health, since these activities were considered as public welfare and non-profitable.

Preventive care and public health service were not priorities for the Chinese government under Deng, and government funding of prevention-based healthcare thus suffered heavily. In fact, government funding of disease control and prevention was cut from 0.11% of China's GDP in 1978 to 0.04% by 1994 (Burns & Liu, 2017:50). Without sufficient funding, local public health professionals and physicians in these agencies had little incentive to provide health promotion and disease prevention services. Thus, they de-emphasized primary care services like physical examinations, health screenings, and activities emphasizing reducing risk factors, as these services did not generate significant revenue.

The decreases in primary and preventive healthcare services and activities ultimately slowed China's progress in improving population health and even resulted in the resurgence of some infectious diseases and chronic illnesses, like diabetes. This consequently had a significant impact on the nation's healthcare system; according to an official report, for example, China will have a 70% increase in the number of patients, a 43% increase in inpatient hospitalization, a 37% increase in outpatient visits, and a 50% increase in total medical expenditures between 2000 and 2025 (Huang, 2013).

4.4 Decentralization of Healthcare Policy Making and Implementation

Since 1978, China's central and local government have had shared governance of health policy. In this decentralized system, the State Council and the Central Committee of the

Communist Party (CCCP) can set the agenda, determine policy, and develop reform programs based on comprehensive analysis of the entire country's needs, but provincial and local governments are the ultimate players because they are the bodies that must comply with and implement the central government's regulations. Further, the provincial and local governments also have some autonomy to adjust policies handed down from the central government per local circumstances and needs.

The central government under Deng also showed an ability to adapt to changing health policy priorities and initiatives by relying on the initiative and creativity of millions of local cadres. This form of decentralization and the integration of bottom-up initiatives has given local political parties and government officials greater power and considerable room to make policies and innovation at the local and provincial levels. Through this decentralized structure, the governing bodies at all five administrative levels (province, prefecture, county, township, and village) all impact, make, and implement policy in China's contemporary healthcare system.

However, local autonomy and flexibility in healthcare throughout China causes a severe issue in related policy-making and implementation, as the localities often ignore or avoid compliance with the central government's regulations, which they often perceive as at odds with their local interests (Aken & Lewis, 2015). Local financing limitations are the biggest constraint to the implementation of centralized policies. Although the provincial governments are empowered to collect their own tax revenues under Deng's administration, they are also the major public financiers of local healthcare and are responsible for healthcare spending. Insufficient local revenues and inadequate financial support from the central government thus inhibit the development of healthcare throughout the country. Further, there are no incentives for local governments to develop policies that are suitable and beneficial for their own localities'

needs. The popular phrase “shang you zhengce, xia you duice,” or “the higher-ups have policies, the lower levels have countermeasures,” appropriately conveys this friction between central and local governments with regard to the implementation of health-related policies in contemporary China (Mori, 2019).

Deng’s efforts to decentralize China’s public health system to reduce central governmental funding for local public health activities has further spurred vast inequities in the provision and quality of services in different areas of the country. Rich provinces often have adequate financial resources to cover costs, but poor ones do not, therefore creating significant disparities between the provinces and counties. Furthermore, the central government granted local public health agencies authority to charge for certain services, such as inspections of hotels and restaurants for sanitary conditions and industries for environmental compliance (Gusmano, 2016). Public health agencies can also establish fee-for-service health centers and hospitals for delivering curative services. Predictably, local public health authorities under Deng have concentrated their activities on revenue-generation, simultaneously neglecting preventive programs such as health education, maternal and child health, and epidemic control (Hsiao et al., 2014).

4.5 Changes in the Ministry of Health

Following the reforms to national healthcare policy under Deng, China’s health bureaucracy – namely the Ministry of Health (MOH) – has developed a more prominent role, instead of the former government’s reliance on the CCP’s ideology. Specifically, in the early 1980s, Deng re-empowered the MOH with overall responsibility for national healthcare policy and administration of healthcare services in China. Then the minister of MOH expanded the

MOH bureaucracy, reduced the impact of party leaders on ministry decisions and appointments, and further initiated the dismantling of Mao's healthcare system.

At the same time, however, Deng's decentralization of bureaucratic and fiscal responsibility over China's healthcare system reduced the actual power of MOH officials to implement health policies. Policy-setting was already constrained by the large number of other ministries and agencies with shared authority over healthcare in the country, consequently requiring significant time and effort for consensus building and policy coordination. At this time, as many as ten ministries and agencies had input over China's healthcare policy-making process, hence limiting the MOH's ability to pursue its goals independently. This has ultimately resulted in a policy structure where, according to Deng, "no one is responsible."

The weak stature of the MOH under Deng was also fostered by the prevalent view among government officials that healthcare spending is more akin to welfare than entitlement. According to this view, healthcare spending does not promote economic growth or impact worker productivity. As a result, other ministries and government departments had little to gain from cooperation with the MOH, thus further limiting the MOH's ability to establish and implement impactful healthcare policies.

4.6 Shallow Social Health Insurance

Lack of insurance coverage and escalation of healthcare service charges under Deng impeded large percentages of the Chinese population from accessing reasonable quality healthcare, which quickly became a key source of social discontent in both urban and rural areas (Hu et al., 2008; Tang et al., 2008; Yip & Hsiao, 2008; Margaret et al., 2007). This issue was commonly referred to the ubiquitous lament among Chinese patients, "kanbingnan, kanbinggui,"

which generally refers to how getting medical services is difficult and expensive (Eggleston, 2010). First appearing in local media and academic studies (Korolev, 2014), this phrase gained serious political attention beginning in 2002. Responding to the growing social protest and public outcry, the Chinese government decided to establish a shallow social health insurance system for the country's nearly 900 million rural residents. Called the "New Cooperative Medical Scheme" (NCMS), this system provides partial subsidies for rural residents for large hospital expenses. A few years later, in 2007, the national government developed another insurance program – "Urban Resident Basic Medical Insurance" (URBMI) – to cover urban residents not already covered by Urban Employee Basic Medical Insurance (UEBMI).

Beside political transformation of the country under Deng and social discontent with the impacts of his decentralization efforts, healthcare policy was also affected and received significant attention country-wide following the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003. At this time, the new President Hu, Jintao and Premier Wen, Jiabao came to power in China with a different set of social values than their predecessors. They emphasized equity in both rural and urban areas and argued that China had to balance the goals of economic development and the well-being of all the people and sought to establish a "socialist harmonious society." This ideology spurred the government to build social safety nets for all citizens in education, healthcare, and income, and further promoted a holistic re-examination of China's healthcare system, eventually leading to the 2009 reform (Bloom, 2011). Leading up to this reform, in October 2006, the theme of health reform was discussed in a collective study session organized by the Politburo. Later in the same year, President Hu announced the new, reformed goal of China's healthcare system "everyone has affordable access to basic healthcare," yet this

announcement did not seem to impact the roles of government and market, thus leaving many of the country's healthcare issues (Hsiao et al., 2014).

4.7 2003 SARS Epidemic

The 2003 outbreak of SARS was not only a public health issue for China, but also a socio-political crisis for Chinese leaders (Huang, 2004). In this global epidemic, China, with 7,429 cases and 685 deaths, accounted for 91.8% of the world's reported cases and 88.5% of the deaths (Lu et.al, 2008). This epidemic served as a catalyst for political leaders and economic planners to realize the importance of primary care and public health in China and to reconsider the Deng-promoted ideology of a market-driven healthcare system. Many public health professionals and official believed that the root causes of China's SARS epidemic were the failures of its healthcare system, as driven by policies of marketization and privatization. In addition, the absence of an effective community-based response to the initial outbreak in Chinese healthcare system also exacerbated this crisis (Huang, 2004). This outbreak ultimately awakened the nation's new leaders, President Hu and Premier Wen (2002-2012), to the urgent need for reform of China's healthcare system (Wang, 2004).

4.8 Pro-Government Camp and Pro-Market Camp

In 2003, Chinese healthcare elites began seriously debating the relative roles of government and market in the country's healthcare. The pro-government camp suggested taking lessons from the United Kingdom's National Health Services and advocated for the government to own publicly-funded facilities dedicate to providing public healthcare services. This camp included the MOH, representing the interests of public hospitals and physicians. In contrast, the pro-market camp argued for using the United States' Medicare and Medicaid program as an ideal

model for increasing government financing for public healthcare through social health insurance agencies, which would then purchase healthcare from competing providers in the market (Hsiao et al., 2013 & Korelev, 2014). Various ministries supported the pro-market camp, including the Ministry of Human Resource and Social Security (MOHRSS), representing the interests of workers. The Ministry of Commerce, representing the interests of state-owned enterprises and business, also supported the pro-market camp because its market-driven policies would promote growth of the healthcare industries. The Ministry of Finance (MOF), responsible for allocation of healthcare funds, had some concerns with channeling new government funding directly to government facilities. Along with the MOF, the National Development and Reform Commission (NDRC)'s primary interest was to assure additional government funding would be used efficiently and effectively and also worried about the dominant role of government in healthcare sector. As these key governmental ministries represented various strong interest groups and were unable to reach a shred consensus, national healthcare policy formulation remained difficult for the Chinese government during this time.

In 2006 the Chinese government established an Inter-ministry Task Force and invited all major stakeholders—ministers from 20 ministries and agencies—to assist the powerful Minister of National Development and Reform Commission (NDRC) and the MOH in developing a health reform plan under the guiding principle of a "socialist harmonious society." This Task Force also invited three top Chinese universities, the NDRC, the World Bank, the World Health Organization and McKinsey & Co. to develop reform proposals, each of which was presented and discussed at a two-day conference held in September 2008 (Thompson, 2008). At this

conference, focused on the principles of harmonious society[1] and global evidence, international experts summarized the disadvantages of China's existing healthcare system and recommended various fundamental guidelines for reform to the Chinese government, including that the government: (1) must take the primary responsibility for financing preventive care as a public good and fund healthcare if equity is a priority; (2) shift its high spending for hospital services to primary care because a primary care focused system would be most cost-effective for China and enhance public health most effectively; and (3) regulate brand name pharmaceuticals and medical devices because of their monopoly. The Task Force then drafted a policy proposal guided by these recommendations, which was subsequently transmitted to the State Council (Yip & Hsiao, 2014; W. Hsiao, personal communication, July 21, 2021).

After the 2008 conference, a basic consensus regarding the role of the Chinese government in national healthcare policy was reached between the two camps: that – the Chinese government must play a significant role in financing basic healthcare services and provide preventive and primary care services for its population. Further, these preventive and primary care services should be delivered via a network of township health centers, village health posts, and community health center. However, the two camps still debated the delivery of hospital services; the pro-government camp believed the most effective way to provide hospital services was through a large network of public hospitals directly funded by the government, whereas the pro-market camp argued that the government should only play a purchaser role in a publicly-run social health insurance system and further that privatizing a public hospital system was the most

[1] Harmonious Society is a socioeconomic concept and political slogan that President Hu and Premier Wen promoted to recognize the social injustice and inequality emerging in Chinese society as a result of unchecked economic growth.

effective way to produce high-quality, efficient healthcare services (Yip & Hsiao, 2014). As of the end of 2014, this debate between the two camps remained unsettled.

4.9 Conclusion

The net consequence of China's market reforms beginning in the late 1970s was a dismantling of the national system of healthcare insurance, delivery, and public health promotion that had been developed under Mao. In Deng's market-based era, government subsidies to hospitals dropped from 30% of revenues in the 1980s to less than 8% by 2000. Hospitals, clinics, and doctors were required to support themselves through the provision of expensive medicines, tests, and services (Burns & Liu, 2017). They had to rely on rising out-of-pocket costs from their patients, which resulted in a lower quality of healthcare due to incentives to over-treat (e.g., test, procedures) and over-prescribe (e.g., IVs, antibiotics), as well as the removal of incentives and funding to conduct health promotion and prevention activities. Excessive prescribing of antibiotics also contributed to growing drug resistance among the population and the rise of superbugs. Over-prescribing may have also fostered greater patient distrust of physicians' motives, consequently leading to additional problems like under-compliance and under-diagnosis of chronic disease (Eggleston, 2014).

Even though economic growth after 1978 increased the wealth of the Chinese population at large, healthcare costs outpaced growth in GDP, therefore leaving the population to finance the majority of healthcare spending out-of-pocket. The out-of-pocket share of health spending reached 60% by 2001. Between 1980 and 2005, disposable income rose 21-fold for urban residents and 16-fold for rural residents, and GPD per capita rose 27-fold; by contrast, national health spending per capita rose 40-fold and out-of-pocket spend rose 102-fold. A hospitalization could thus cost an individual their entire annual income. Not only was healthcare less affordable

to individuals, it was also less affordable for the country. During the 1980-2003 period, healthcare spending rose 45-fold, while government spending on healthcare rose only 20-fold (Burns & Liu, 2017). This meant greater cost shifting to the private sector and, especially, to individuals: out-of-pocket spending as a percentage of total spending rose from 21% to 56% during this period (Burns & Liu, 2017: 54-55). Not surprisingly, high healthcare costs became the top concern for residents of China, per their responses in national health surveys.

China's population grew increasingly dissatisfied with the costs of healthcare, low access to care, and the poor quality of facilities and medical personnel in rural areas. According to one analyst, "by the mid-2000s, medical care, education, and social security became the "three new mountains" that burdened Chinese people, reminiscent of the old "three mountains" (imperialism, feudalism, and bureaucrat-capitalism) used by the Communist Party to justify its social revolution that led to the founding of the People's Republic in 1949.

In recent years and under new political leadership, the Chinese government has turned from Deng's market-based policies and priorities and sought to develop community health centers to promote primary care and reserve district hospitals for inpatient care. The national government has faced a huge challenge in this regard, as the country's doctor-training program have for years produced specialists but no primary care physicians. This challenge should be solved by new political leaders – Xi Jinping in next decade.

CHAPTER 5

REFORM OF THE CHINESE HEALTHCARE SYSTEM BEFORE AND POST 2009

5.1 Introduction

In response to chronic issues with quality and access of healthcare in China, the Chinese government launched an ambitious, systematic, and universal reform of the healthcare system in 2009. President Hu explicitly stated that the goal of the reform was to provide "safe, effective, convenient, equal, and affordable" healthcare services to every person in China by 2012 (Yip et al., 2009). Over the next three years, the Chinese government invested an estimated 850 billion RMB ($124 billion USD) in five specific areas of healthcare with the central government funding 40% of the reform efforts: (1) expanding basic health insurance coverage; (2) primary care facilities construction, pharmaceutical market reform, public health services improvement, and public hospital reforms (Yip et al., 2009 & Zhang et al., 2018). These five initiatives – though successful to some degree and in some ways – have also resulted in unintended negative consequences for China's healthcare system.

5.1.1 Expansion of Basic Healthcare Insurance Coverage

The first of the five initiatives under the Chinese government's 2009 healthcare reform plan focused on expanding healthcare insurance coverage. As a result, annual government subsidies for insurance increased from 80RMB per capita in 2008 to 200RMB per capita by 2011 (Burns & Liu, 2017:58). By the end of 2011, three basic health insurance schemes covered 95% of China's total population: Urban Employee Basic Medical Insurance (UEBMI) (covering 45.8 million people), Urban Resident Basic Medical Insurance (URBMI) (covering 221 million people), and New Rural Cooperative Medical Scheme (NRCMS) (covering 832 million people)

(Yip & Hsiao, 2015). Moreover, in 2016, the central government announced the merger of NRCMS and URMBI into Urban-Rural Resident Basic Medical Insurance (URRBMI) for the purpose of expanding the risk pool and reducing administrative costs (The State Council, 2016).

Although insurance coverage increased to 95% of China's population in 2011, the country's issues providing accessible and affordable healthcare have not been successfully alleviated. A significant factor contributing to this problem is the lack of annual caps on patients' out-of-pocket spending. In 2011, out-of-pocket spending per capita was RMB 1643.2 ($252 USD), representing about 35.5% of total health expenditure (NHFPC, 2012). A fairly high percentage of this out-of-pocket spending is for prescription drugs. According to a survey of Chinese citizens released by the independent Horizon Research Consultancy Group in October 2013, 95% of respondents noted that it was expensive to seek healthcare, and 87% stated that healthcare costs were higher than they had been four years earlier. Twenty-seven of respondents reported opting not to be hospitalized at times, with 74% of this group attributing the choice the high cost of inpatient care.

Yet, while some patients have opted out of certain treatment due to high cost, the expansion of healthcare insurance in China has generally resulted in increasing demand for healthcare. The average occupancy rate of the country's hospital beds surged from 74.7% in 2008 to 88.5% in 2011, with the average length of stay in hospitals increasing from 8.6 days to 10.3 days during the same period (The State Council, 2019; NHFPC, 2012). Responding to the same 2013 Horizon Research Consultancy Group survey, more than 57% of respondents stated that it was difficult to see a doctor, compared to only 20% who stated that seeing a doctor had become easier than it was four years earlier.

Despite the government's expansion of healthcare insurance coverage, the negative consequences of increased out-of-pocket spending for patients, higher demand for healthcare, and longer duration of hospitalization resulted because the insurance reforms did not include any reform of provider payments. This left intact the country's old system of fee-for-service payments, thus directly leading to the increased healthcare provider-induced demand for services and over-utilization of healthcare services. Ultimately, this neglect in planning meant the problems of rising over-utilization of healthcare services and cost of such services were likely to persist, continuing to erect barriers of accessibility and affordability to healthcare in China.

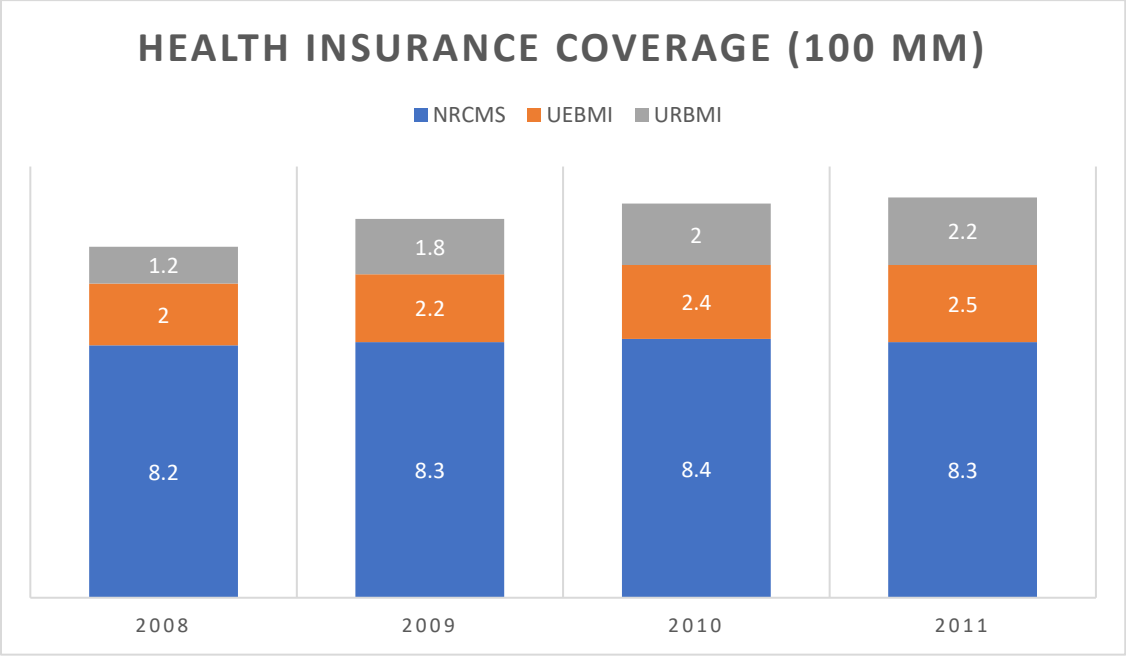


Figure 1: Expansion of Insurance Coverage, 2008 – 2011

Source: Ministry of Health, National Statistics Bureau, The Central People's Government of the People's Republic of China

Hospital Bed Utilization Rate (%)				Length of Stay in Hospital (Days)			
2008	2009	2010	2011	2008	2009	2010	2011
74.7	77.7	86.7	88.5	8.6	8.6	10.5	10.3

Figure 2: Hospital Bed Utilization Rate and Length of Stay in Hospital, 2008 – 2011

Source: National Health and Family Planning Commission of the People's Republic of China, National Statistics Bureau, The Central People's Government of the People's Republic of China

5.1.2 Expanding Infrastructure for Local Medical Networks

The second initiative under the Chinese government's 2009 healthcare reform plan focused on expanding healthcare infrastructure at the local level and establishing local medical networks. The central government believed that constructing this healthcare infrastructure would build and replenish the country's long-absent primary care system, in turn serving the broader goal of providing effective, convenient, and affordable healthcare for the Chinese population. To carry out this initiative,

The central government invested 63 billion RMB ($10 billion USD) from 2009 – 2011 to build approximately 2,000 county hospitals and 29,000 Township Healthcare Centers (THC), upgrade or expand the country's 5,000 existing THC, and build and upgrade 3,700 urban healthcare service centers and 11,000 Community Health Stations (CHS) (USCBC, 2011).

In rural areas specifically, these reform efforts included placing two family physicians in each THC to serve local populations and stimulate the demand for local treatment. To reduce self-referrals to county hospitals and encourage reliance on local THCs, the government also increased the rate of reimbursement for services provided in THCs to 70% and reduced the reimbursement rate for county hospitals. However, merely raising reimbursement rates for THC services did not result in increasing utilization of them by local populations. Instead, a large number of rural residents chose village clinics over the THCs because of lower prices and their

proximity. Moreover, rural residents continued to self-refer themselves to county hospitals rather than THCs when they were suffering from "serious" diseases, because of the belief that they would receive higher-quality healthcare services at the county hospitals.

The central government's investment into expanding infrastructure for local medical networks also included purchasing equipment for the local healthcare facilities, hiring general practitioners to serve provinces in central and western China, and subsidizing medical school tuition for students who committed to practicing in these rural areas (Cheng, 2012). These investments aimed to improve China's healthcare infrastructure by ameliorating the disparities in China's medical workforce between rural and urban areas (USCBS, 2011). As part of these efforts beginning with the 2009 reform, China's Ministry of Health (MOH) has taken measures to attract healthcare personnel to rural regions, where job incentives are typically lower than urban areas, such as providing subsidies to improve on-the-job training of clinicians and managers in township and village clinics and to increase the qualified healthcare workforce in rural areas. By 2011, the central government aimed to subsidize the employment of 3,000 licensed physicians in township clinics and waive tuition fees for students who would like to work in township clinics after graduation, with the goal of employing at least one licensed physician in every township clinic by the end of 2011 (USCBS, 2011).

5.1.3 Building an Essential Drugs List

The third initiative under the Chinese government's 2009 healthcare reform was to develop an Essential Drugs List (EDL), essentially a list of commonly used medicines that would be sold at controlled prices, aimed at reducing the cost of prescription drugs patients treated in primary care facilities. The list covered drugs that treat between 60% to 80% of the most common diseases, which could increase healthcare accessibility for the populations living in

poorer, rural areas. All drugs on China's EDL are covered by the country's three public insurance schemes, meaning patients must only pay low percentage out-of-pocket costs. As a result of this reform initiative, 307 cost-effective drugs were added to China's EDL in 2012 (Burns & Liu, 2017:58). By the end of 2018, the list contained 685 drugs (417 chemicals and biological products and 268 Chinese patent medicines) (NATCM, 2018; He et al., 2018). Moreover, the 2018 EDL officially shifted coverage from a "basic" model to a "comprehensive" one by including some pediatric drugs and cancer drugs for the first time.

Further, to reduce the burden of prescription drugs on patients, the central government initially mandated that THCs prescribe only drugs on the EDL and eliminate the previously charged 15% markup on said drugs.

Local governments were required to establish funds to compensate THC's lost revenues of drug sales. However, neither local governments nor THCs complied with these mandates. Local governments instead retained their funds for their own operating budgets, and THCs continued selling drugs at marked-up prices to fund their operations. The lack of compensation from local governments incentivized THCs to accept kickbacks from manufacturers and prescribe higher-priced drugs that were not included on the EDL. There is an evidence shows that local facilities induced healthcare demand for their inpatient services to offset their lost revenue (Yi, 2015), even though they used roughly three quarters of the 307 drugs on the EDL (Yin et al., 2015).

5.1.4 Improving Public Health Services

The fourth initiative under the Chinese government's 2009 healthcare reform was to improve public health services by increasing public health funding per capita from 15RMB to 25

RMB (Burns & Liu, 2017:59). Improvements to public health improvement specifically included establishing individual healthcare records, providing vaccines and screening programs for disease prevention and early diagnosis, managing both communicable and non-communicable diseases, and promoting health education (The Lancet, 2015).

5.1.5 Reforming the National Public Hospitals System

The fifth and final initiative under the Chinese government's 2009 healthcare reform was to reform national public hospitals systems in five specific ways (Guo, 2011): (1) increase access to healthcare services by improving the capacity of public hospitals and healthcare delivery services in both rural and urban areas; (2) prioritize building county hospitals (3) establish a referral system between primary care providers and urban public hospitals and encourage urban hospitals and county hospitals to assist urban community hospitals and rural township hospitals (as these healthcare facilities are regarded as primary care facilities); (4) improve the quality of healthcare to improve patient satisfaction by standardizing training for resident physicians, standardizing patient treatment, promoting electronic clinical pathways, and controlling the medical costs for patients of diagnosis and treatment; and (5) extend alternative payment models to hospitals to incentivize the provision of lower-cost care services.

However, these five reforms have been slow to produce their intended results of increasing access to and affordability of healthcare in China, because hospital executives naturally resisted the efforts. Generally, hospital executives in China are senior physicians in hospitals who are nominated and appointed by the Organization Department of the CPC. Often, these physicians lack managerial training and only have short tenures in their executive roles, thus giving them little motivation to pursue long-term systemic reform (Carr, 2011). Efforts to

separate government operation from hospital management in China have therefore been largely unsuccessful to date, as have efforts to change the revenue models of public hospitals.

Although the Chinese government sought to reform the country's healthcare system in these five specific areas, issues with accessibility and affordability of healthcare in China remain. The main reason for continuing issues is insufficient funding for hospital. While two-third of the government's investment in reforms were allocated to increasing the number of providers, leaving only 10% for public hospital revenue. Hence, health insurance benefits are lacking, and the government has not invested enough to strongly influence how public hospital operate. To deal with these remaining challenges, the government then shifted its focused to improve the country's primary care system, especially building primary care facilities. In addition, the patchwork insurance coverage offered through UEBMI and URBMI created several new issues, including dual coverage, government overpayment of subsidies, duplicate information systems and staffing, and lack of portability of services across geographic settings (Hu et al., 2013). These unintended consequences of the 2009 reform efforts have ultimately led the Chinese government to focus on improving the overall organization of the nation's healthcare system.

5.2 Improving the Organization of China's Healthcare System

Many actors participated in discussions surrounding reform of China's healthcare system in 2007healthcare system reform discussion in 2007, and each playing a different role and having unique responsibilities within the system (see **Figure 3**). For example, the Ministry of Health (renamed the "National Health and Family Planning Commission" in 2013 and the "National Health Commission" in 2018) supervises the public hospitals and public health services; the National Development and Reform Commission (NDRC) determines the costs of healthcare services and medicine; the Ministry of Finance (MOF) oversees the government's financial

support to and investments in healthcare and provides the insurance subsidies; the Ministry of Human Resources and Social Security governs two urban insurance schemes (UEBMI and URBMI); the Ministry of Civil Affairs supervises medical aid for the poor; and the Ministry of Commerce oversees drug wholesaling and distribution(Yip et al., 2008). This complicated multi-sectoral system of both cooperation and competition over the governance of China's healthcare system ultimately limits the system's functionality and results in an uncoordinated, fragmented system that will likely continue to result in increased costs and unpredictable quality of healthcare.

Agency	Responsibility
National Development and Reform Commission	• Set economic policy, including prices for drugs and services • Generate five-year plan and budget
National Health and Family Planning Commission (Formerly the Ministry of Health and the State Population and Family Planning Commission)	• Manage healthcare system – oversee hospitals and clinics • Provide universal access to basic health services • Maintain public health • Oversee reproductive health of women
Ministry of Finance	• Produce annual healthcare budget • Monitor financial performance in accord with five-year plan
Ministry of Labor (now Human Resources) and Social Security	• Manage state medical insurance programs • Set prices for essential medicines • Manage civil servants, including those in healthcare sector
State Commission Office for Public Sector Reform	• Oversee management of government departments at national and provincial levels • Establish division of labor between State Council-level ministries and provincial bureaus • Supervise reforms at national and provincial levels
Ministry of Education	• Oversee medical schools
Ministry of Civil Affairs	• Maintain safety net (e.g., healthcare access) for the poor in rural areas
Legislative Affairs Office of the State Council	• Draft the rules established by the reform small group • Coordinate activities of departments and ministries • Narrow discrepancies and resolve

	disputes
State Council Development Research Center	• Government think tank that initiated the reform process
China Insurance Regulatory Commission	• Supervise and manage the private health insurance market
China Food and Drug Administration	• Ensure drug safety • Incorporated into the MOH in 2008
State Traditional Chinese Medicine Administration	• Oversee TCM practitioners and TCM research
State-Owned Assets Supervision and Administration Commission of the State Council	• Oversee and manage SOEs
All-China Federation of Trade Unions	• Represent the Chinese labor force

Figure 3 Organization of China's Healthcare System

Source: Drew Thompson. 2009. "China's Health Care Reform Redux," in Charles Freeman (Ed.), China's Capacity to Manage Infectious Diseases: Global Implications (Washington, DC: Center for Strategic & International Studies): 59-80

As recently as 2018 did the State Council re-structure the central government's healthcare system (Tikkanen et al., 2020). To meet the central government's mission to deliver basic healthcare to every citizen, local governments are required to engage in the healthcare system and, specifically, are responsible for organizing and providing basic healthcare services for their local populations (see **Figure 4**).

Following this 2018 reorganization, China's central government remains responsible for national health legislation and policy (Tikkanen et al., 2020). National and local healthcare agencies and authorities must oversee healthcare quality and safety, price control, equitable care, clinical guidelines, provider payment schedules, and health information technology. Further, under the 2018 reorganization, the responsibilities of various governmental agencies include the following:

- The National People's Congress (NPC) oversees healthcare policies, technically speaking. Many healthcare policies and changes are designed and enacted by the State Council and the Central Committee of the Communist Party. These changes are treated as law (Tikannen et al., 2020);

- The National Health Commission (NHC) remains the main national health agency in China's healthcare system and responsible for formulating national health policy. In addition, its responsibilities include supervising public health, medical care, and emergency and family planning services as well as motivation the advancement of medical and healthcare reform. The NHC also oversees the China Center for Disease Control and Prevention (Tikannen et al., 2020);
- Established in 2018 pursuant to the reorganization, the National Healthcare Security Administration (NHSA) replaced the Ministry of Human Resources and Social Security and the Ministry of Health to oversee China's three basic medical insurance programs. In addition, this agency oversees state-backed China Healthcare Security programs, including catastrophic medical insurance, maternity insurance program, the pricing of pharmaceutical products and health services, and medical aid programs (Tikannen et al., 2020);
- Also established in 2018 pursuant to the reorganization was the State Administration for Market Regulation (SAMR). This agency is responsible for market regulation matters which were once divided up among the General Administration of Quality Supervision (GAQS), Inspection and Quarantine (IQ), and Food and Drug Administration (FDA). The agency is now responsible for drug approvals and licensure;
- The National Development and Reform Commission and the Ministry of Finance remains responsible for overseeing healthcare competition among health care providers and for providing funding for healthcare subsidies and healthcare insurance;
- Local government (of prefectures, counties, and towns) are allowed to have their own health commissions, departments, or bureaus, and these offices administer disease control

and prevention efforts. Nationally, the China Center for Disease Control and Prevention works with local health centers by giving technical support (Tikkanen et al., 2020).

China's central government has undertaken efforts to reorganize the country's healthcare system and is broadly working to improve intersectoral coordination and cooperation of the many involved agencies. The central government aims to build an effective system of high-quality healthcare system to ensure the provision equitable, accessible, and affordable services by 2030.

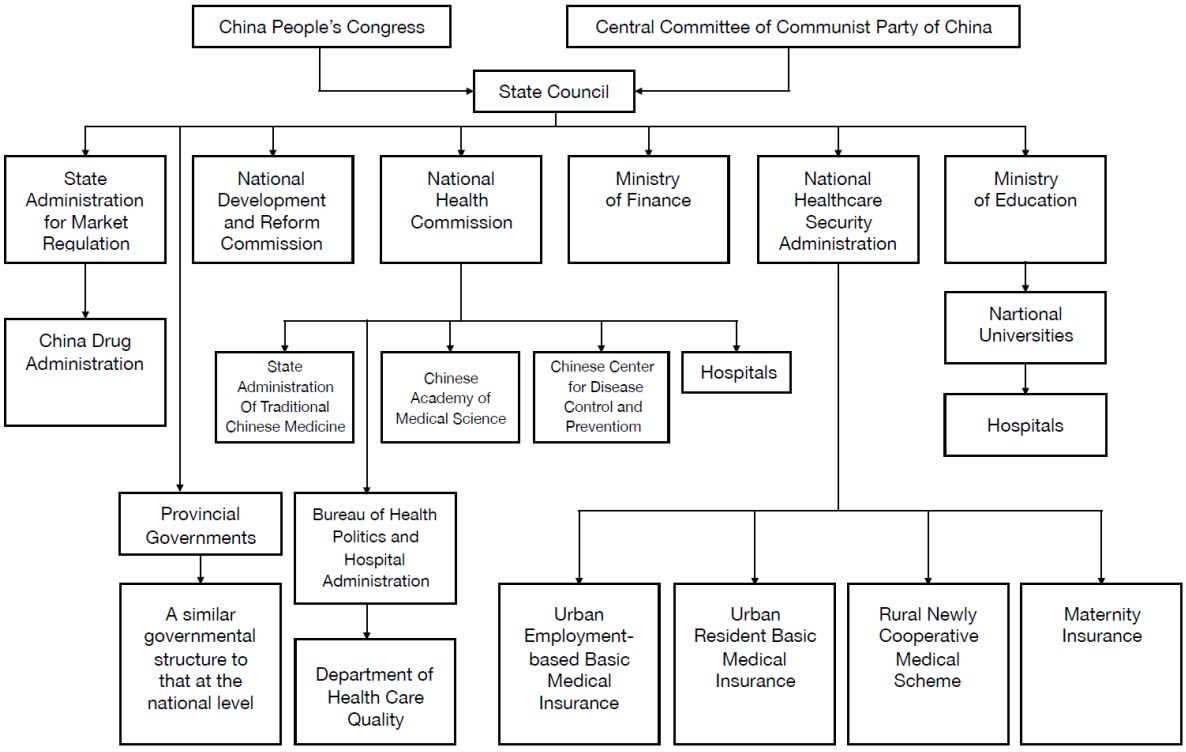


Figure 4 The Organization of Health System in China

Source: China People's Congress, National Health Commission, National Development and Reform Commission, National Healthcare Security Administration; The Commonwealth Fund, 2020

5.3 Primary Care Reform and Remaining Issues

One of the most significant undertakings of China's 2009 healthcare reform was to shift from a model of hospital-centric focused care to a more balanced model with stronger primary care, to serve the overarching goal of providing Chinese citizens with universal, equitable access to high-quality healthcare (WHO, 2015). However, primary care in China is constrained by the fragmented healthcare system following 1978, as well as weak ratings of patient trust and satisfaction with community healthcare provisions, the availability of high-quality primary care physicians, and inadequate primary care workforce.

First, China's fragmented healthcare system has directly resulted in low rates of use of country's existing primary care system. In the years following the nation's open-market reforms in the early 1980s, fiscal decentralization, commercialization of medical services, and underfunding of the primary care sector, a large number of government-run primary care centers closed or turned to more profitable healthcare sectors like pharmaceuticals and high-tech diagnostics (Wagstaff et al., 2009). Tying physicians' compensation to their revenue-generating ability in this way led to the overprescribing of high priced, often unnecessary medical tests (Ramesh et al., 2013). As a result, these economic and health system reforms resulted in the deterioration of primary care physician-patient relationships in China.

Following the period of market-driven reforms, the Chinese government began to focus on improving the country's fragmented healthcare system and on prioritizing public leadership and investment in primary care services, but primary care service utilization remains low. In 2007, a primary care physician in China saw an average of 13 patients per day, and only 14% of all healthcare visits took place in primary care facilities (Bhattacharyya et al., 2011). One of the main reasons for this underutilization is the public's general lack of knowledge regarding

primary care services. In fact, only 59% of residents knew about the existence of primary care facilities in their own communities (Bhattacharyya et al., 2011).

Second, primary care facilities are underused in China because the capacity of community-based primary care providers (PCPs) is low. Compared to the workforce in secondary and tertiary hospitals, a large number of PCPs in China are less educated, resulting in lower quality services. According to a survey, only 31.8% of health workers in China's community health centers have a bachelor's degree or greater and this figure is even lower in township health centers (Bhattacharyya et al., 2011) Moreover, only 0.7% of doctors in village clinics have bachelor's degree or greater, while 78.3% have less than a technical school education (Shi et al., 2013). As the community health centers (CHCs) and village clinics are the first contact point for China's urban and rural population respectively, less-educated healthcare workers may not be able to provide high-quality primary care. As such, a lack of trust in primary care providers is prevalent throughout China, and especially in larger cities, where patients have more access to secondary or tertiary healthcare services and primary care facilities are most underused.

Third, the lack of primary care physicians is another barrier to the development of a robust primary care system in China. During the Maoist era from 1949 to 1976, most generalist physicians were trained in vocational schools, then later in the Barefoot Doctor program, playing an important role in delivering basic healthcare in rural areas. However, subsequent economic reform resulted in a more urban-centered, hospital-based, and specialty-oriented medical workforce, ultimately leading to the shortage of primary care physicians. A significant factor is that primary care physicians are the lowest paid of medical personnel in China and have the lowest social standing of all specialties in China. Although the healthcare workforce supply in

China has significantly increased following the 2009 healthcare reform, the workforce remains insufficient to satisfy the vastly increased demand for healthcare services (Cheng, 2012) (see **Table 1** comparing the number of general practitioners per 1,000 population and the number of nurses per 1,000 population in OECD countries versus China). By the end of 2019, the number of general practitioners (GPs) and nurses per 1,000 population in China was 0.26 and 3.18, respectively (China Health Statistical Yearbook, 2019). These rates are at the very low end of the number of GPs (0.31 to 2.83 per 1,000) and nurses (3.38 to 17.88 per 1,000) in countries that are part of the Organization for Economic Co-operation and Development (OECD) (OECD. Stat, 2021). Therefore, investment in training primary care physicians with the broader goal of improving primary care system in both urban and rural areas remains a central part of China's current and future efforts for healthcare reform (The Lancet, 2015).

Country	General Practitioner	Nurse
China	0.14	2.01
Australia	1.53	11.52
Austria	1.64	7.87
Canada	1.21	9.48
Denmark	0.69	16.3
Germany	1.69	12.96
Korea	0.60	5.61
Mexico	0.77	2.62
Netherlands	1.54	8.4
New Zealand	0.94	10.39
Norway	0.87	16.67
Spain	0.75	5.14
Sweden	0.64	11.15
Switzerland	1.11	17.36
United Kingdom	0.80	8.26
United States	0.31	N/A

Table 1: Number of General Practitioners and Nurses per 1,000 Population in Select OECD Countries, 2014 or Neatest Year, and China, 2015 (General Practitioners) and 2013 (Nurses)

Source: Data for OECD countries from OECD Health Statistics 2015. Date for the number of general practitioners per 1,000 population for China from Chen Zhu, vice chairman of China's National People's Congress and former minister of health; and that for nurses per 1,000 population from OECD Health Statistics 2015.

To address these problems, the Chinese government implemented a two-part reform in 2009. First, the government made large investments in building primary care infrastructure and training primary care personnel. The government's greatest accomplishments have been in increasing the number of primary care facilities that patients can access. Between 2008 and 2012, the number of community health centers (CHC) increased from 24260 to 33562 (China Health Statistical Yearbook 2012, 2012). The average number of general practitioners per 10,000 people increased from 1.38 to 2.61 between 2015 and 2019. The average number of physician assistants per 1,000 people and the average number of nurses per 1,000 people also increased from 2.21 to 2.21 and 2.36 to 3.18, respectively between 2015 and 2019 (China Health Statistical Yearbook 2015, 2015; China Health Statistical Yearbook 2019, 2019). As the government build and renovated community healthcare facilities and trained more primary care professionals, which incentivized patients to see doctors at primary care facilities. The number of outpatient visits increased from 1.71 billion to 2.03 billion from 2015 to 2019. A primary care physician sees an average of 16.5 patients per day and 23.3% of all visits take place in primary care facilities (China Health Statistical Yearbook 2019, 2019).

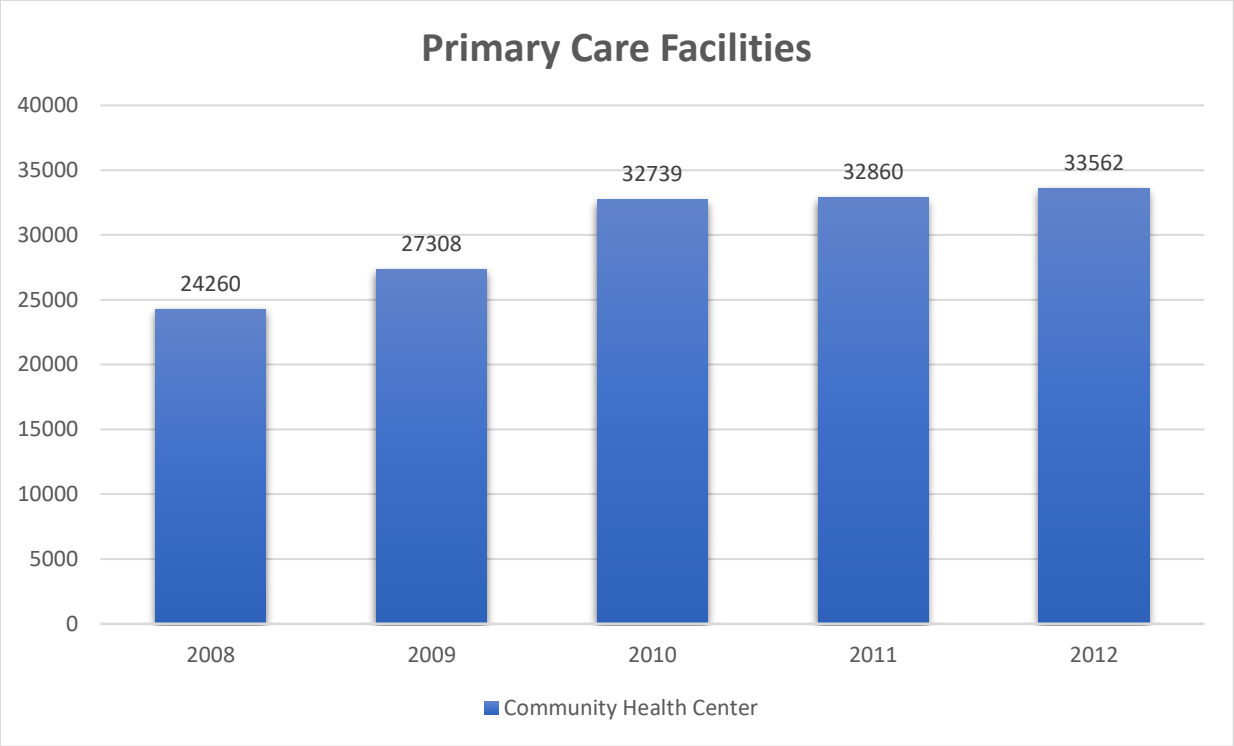


Figure 5: Number of Primary Care Facilities in China From 2008 to 2012

Source: China's Health Statistical Yearbook from 2008 to 2012

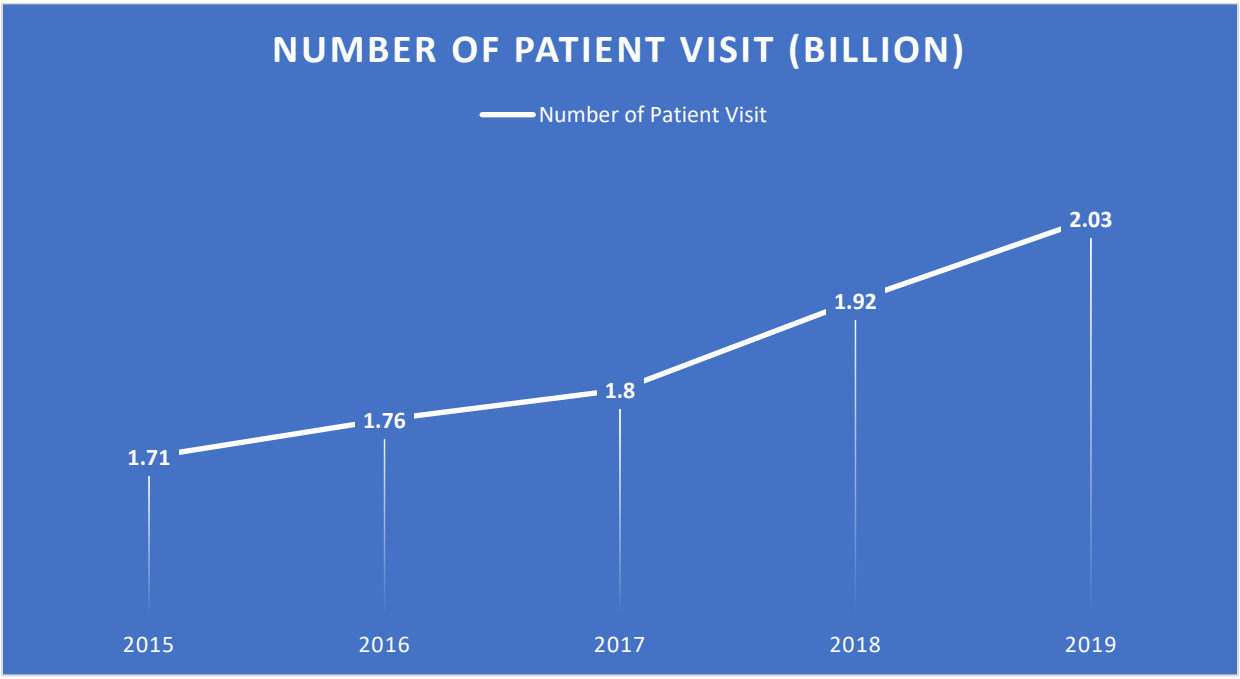


Figure 6 Number of Patients Visits Per Year, 2015 – 2019

Source: China's Health Statistical Yearbook

Second, the 2009 healthcare reform also focused on changing the primary care facilities' financing model away from reliance on prescription and medical procedure revenues. Building Essential Drug Lists (EDL) and "Separating Revenue from Expenditures" (SRE) are the main policies in this reform (World Bank, 2010). By the end of 2018, the EDL contained 685 drugs, which consist of 417 chemicals and biological products and 268 Chinese patent medicines (NATCM, 2018; He et al., 2018). These drugs were covered by the public insurance schemes, which reduced prescription drugs cost that patients had to pay in primary care facilities.

The SRE required the primary care facility to turn over all revenues, including pharmaceutical prescribing and medical services revenues, to the local healthcare financing bureau. In return, the primary care facility will receive a global budget and the opportunity for performance-based bonuses, encouraging more patient-centric care. The separation of primary care revenue from pharmaceutical revenue is still in its early stages. However, just as in the EDL drug reform, properly implementing SRE will require local governments to find a funding source sufficient to replace revenues from pharmaceuticals. In the absence of a sufficient funding source, physicians may engage in other revenue-enhancing behavior such as soliciting bribes or refusing to see time-intensive patients such as those with noncommunicable diseases (NCDs).

CHAPTER 6

STRENGTHENING THE HEALTHCARE WORKFORCE TO IMPROVE PRIMARY CARE IN CHINA

The current primary care workforce in China needs to be strengthened to enable primary care facilities to effectively coordinate the flow of patients and workers within the entire healthcare system. However, myriad barriers remain before this progress can be made: the education system for the healthcare workforce, workforce composition, compensation and perverse financial incentives, headcount quota system, and workforce mobility still pose great challenges that must be addressed.

6.1 The Chinese Healthcare Labor Market: Trends and Challenges

6.1.1 China's Healthcare Professional Education System

The healthcare professional education system in China has experienced substantial changes in recent decades. In 1998, the Ministry of Education merged individual medical schools into universities, and this has led to China having the world's largest undergrad, graduate, and professional development medical education system. From high school, students can directly enroll in clinical medicine courses for three years (to earn a vocational diploma – serve as physician assistants), five or six years (to earn a master's degree – serve as community health workers), or eight years (to earn a medical doctorate – serve as specialists) (Hou et al., 2014). Graduates normally directly proceed to work in a hospital or primary care facility after graduation. The total number of healthcare workers in China increased from 6.2 million in 2011 to 12.9 million in 2019, 39.2% of whom hold bachelor's degrees or above and 59.7% of whom have received vocational school training (2019 China Health Statistical Yearbook, 2019). By the

end of 2019, there are 3,869,916 physician assistants, 3,210,515 physicians, 4,445,047 nurses, and 483,420 pharmacists (2020 China Health Statistical Yearbook, 2020).

While this trend may seem like a net positive, this recent and continuing massive increase in China's professional healthcare education system also raises important concerns. Because of job security, social status, and parental wish, more and more students choose medical school (Yang et al., 2021). The upsurge in medical school enrollment has resulted in a poor student-to-teacher ratio, which contribute to a decline in educational quality and a shortage of clinical internship slots (Daermmich, 2013). In China in 2018, roughly 93,000 students studied clinical medicine in China across 186 schools. Due to the allocation of educational resources per school, the quality of medical will be negatively affected by high enrollment (Wang, 2021).

Second, the lack of cooperation between the Ministry of Education, now in charge of the country's professional healthcare education system, and the National Health Commission (NHC) has led to medical education being unable to meet labor market needs for primary care. National and provincial education departments oversee medical education in China. The health department is responsible for the general residency and professional development training programs. Despite efforts from the central government, (i.e., "Medicine-Education Cooperation"), more effort is needed to improvement coordination between the medical education system and medical care system (Wang, 2021). In some provinces, medical training is slow in responding to external demands, training modes are inflexible, and curriculum in medical schools focuses narrowly on biomedicine, medical technology, and clinical practice, with very little exposure to primary care and community-based care (Hou et al., 2014). The main reason is that primary care is a relatively new discipline to medical school in China, very few of them have departments of general practice (Wong et al., 2017); additionally, serious shortage of qualified teachers in

primary care also results in the curriculum design does not include primary care training (Morikawa, 2020). In response to these concerns, the State Council issued a policy directive in 2018, "Opinions of the State Council on Reforming and Improving the Training and Incentive Mechanism for General Practitioners (GPs)," which requires medical schools to expand their programs to train more qualified GPs. In 2020, the directive was updated to require that medical schools enroll 20% of total medical students into general practice program (5-year medical school plus 3-year family medicine residency training), and to encourage teaching hospitals to create general-practice departments to meet the target of two to three GPs per 10,000 population in 2020 and five by 2030 (The State Council, 2018). This ambitious plan seeks to force the medical schools and teaching hospitals to upgrade their training plans even though they are not necessarily ready or qualified to train qualified GPs.

6.1.2 Imbalances in China's Primary Care Workforce Composition

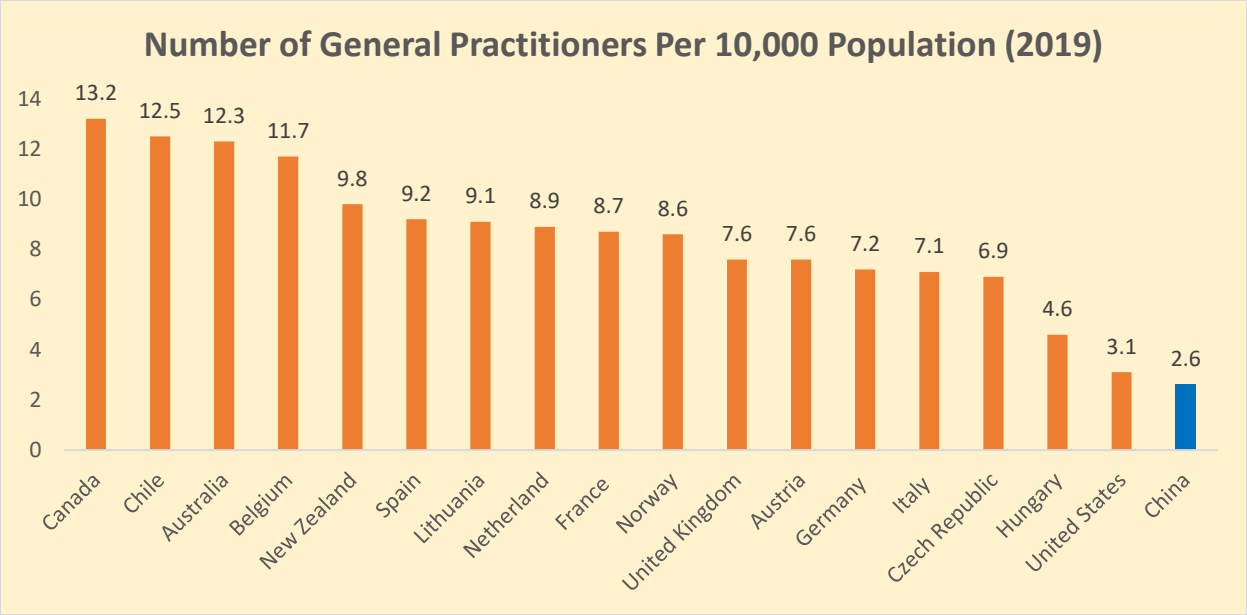
In the next decade, China will need more a robust primary care workforce to meet the challenges caused by increases in population, aging, and shifting disease patterns. Although the number of physicians and nurses has increased in general in China by approximately 5% over the past 10 years (China Health Statistical Yearbook, 2020), this will likely be insufficient. China will need to address the primary care workforce shortage to fulfill its primary care system goals (Yip et al., 2010).

In primary care, GPs treat many types of routine health concerns and answer questions about patients' infections, chronic conditions, or medicines. By the end of 2018, GPs and doctors in primary care constituted only 4.8% and 2.5%, respectively, of all licensed physicians in China. In contrast, the percentage that are generalist (without general internal medicine) in the 34 Organization for Economic Co-operation and Development (OECD) in 2013 was 29%. It was 47%

in Canada and 29% in the UK, compared with 4.8% in China (Dalen et al., 2017). By the end of 2019, the number of GPs per 1,000 population in China was 0.26 (2019 China Health Statistical Yearbook, 2019). This rate is the very low end of the number of GPs (0.31 to 2.93 per 1,000) in countries that are part of the OECD (**Figure 7**) (OECD. Stat, 2021). To address the gaps, the State Council implemented a policy that would require 2-3 GPs per 10,000 population and increase to 5 GPs per 10,000 population to reach the level of U.K.'s practice – one GP per 2,000 population (The State Council, 2019). To meet its 2030 target of 5 GPs per 10,000 population, China needs at least 400,000 GPs – a figure more than double the country's current licensed GP workforce (2019 China Health Statistical Yearbook, 2019).

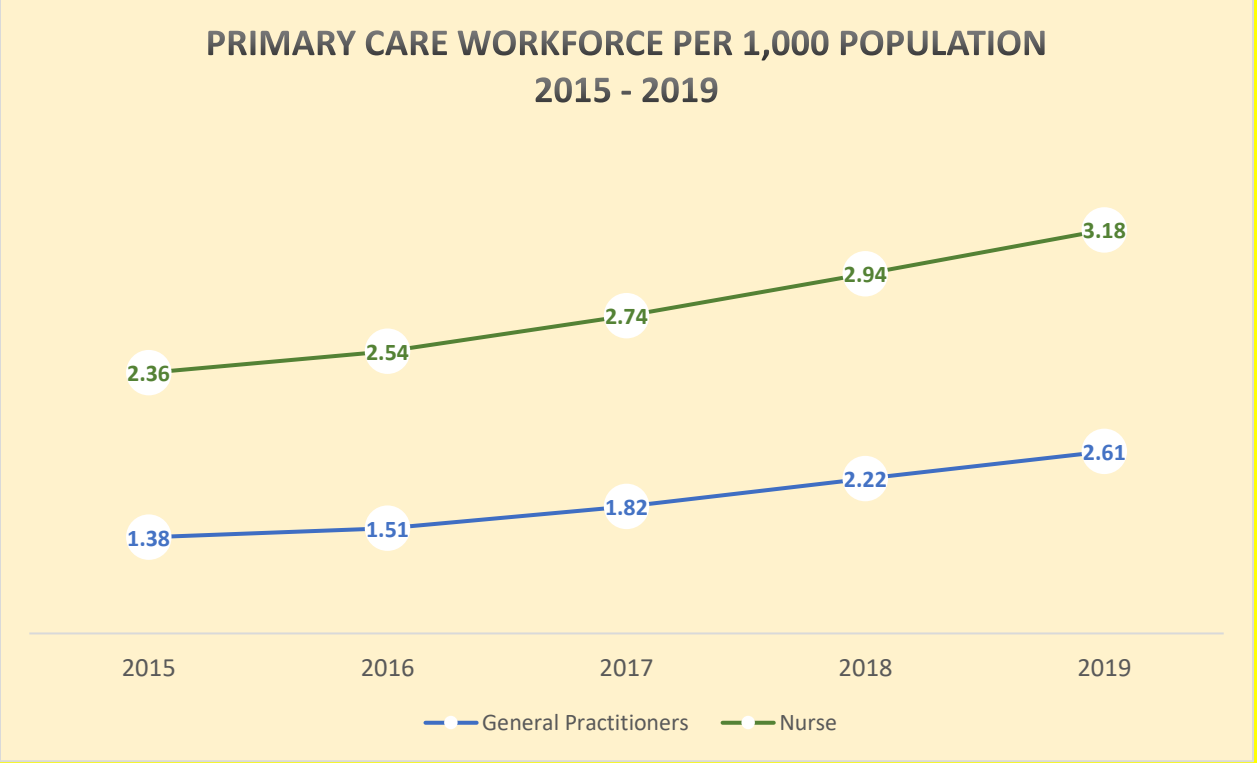
In primary care, nurses hold numerous roles, including giving medications/immunization, education patients, planning care with a team, providing care in triage and over the phone, working under a licensed physician, and more. China's number of nurses per 1,000 population increased from 2.36 in 2015 to 3.18 in 2019 (**Figure 8**) Yet, the number of nurses per 1,000 population is also significantly lower than that in OECD countries such as the United Kingdom (8.2) and Canada (9.98) (OECD. Stat, 2021).

FIGURE 7 Number of General Practitioners Per 10,000 Population in China, 2019



Source: China Health Statistical Yearbook 2019, and OECD Health Statistics 2021

FIGURE 8 Number of Primary Care Workers Per 1,000 Population in China, 2015-2019



Source: China Health Statistical Yearbook 2015-2020

Second, another central tension is the uneven distribution of healthcare workers. Although the government encourages healthcare workers to practice in community-level settings or rural areas, healthcare professionals in China are still heavily concentrated in cities because they offer more attractive compensation levels and permanent Hukou ("China Household Registration") provides more advantageous education and medical resources for healthcare workers' families (W. Hsiao, personal communication, July 21, 2021). One interview found that close to 50% of primary care practitioners and registered nurses left primary care to work in higher-level healthcare institutions (Interview 2, 2021). The urban-rural ratio of healthcare workers per 1,000 people was 2.35 in 2018. This means that urban region has 2.2 more physicians and 2.8 more nurses than rural regions (China Health Statistical Yearbook, 2019).

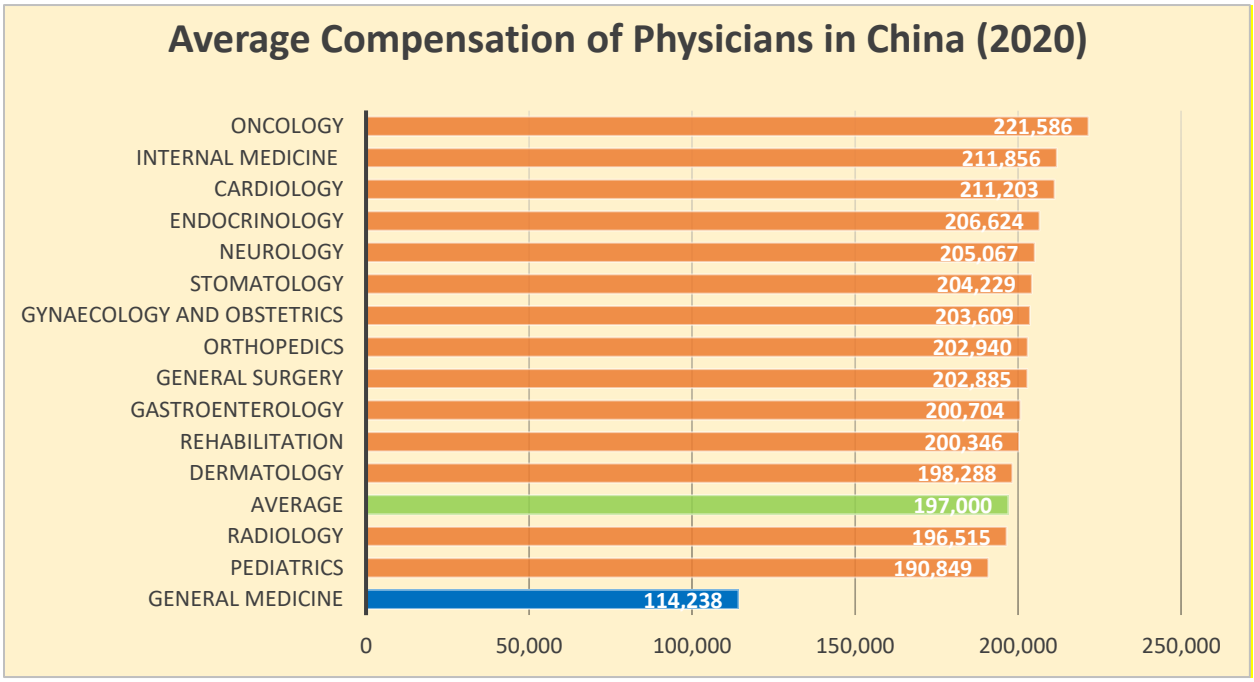
Another facet of this issue is that primary care professionals working in rural primary care settings are under-educated compared to those in higher-level facilities and more urban regions, even though their job titles are doctors. In 2018, 32% of the primary care professionals in China's urban areas primary care facilities had a bachelor's degree or above compared to that of only 14.9% in rural areas. In community and township health centers, the majority of primary care workers only have post-high school training and secondary school training (W. Hsiao, personal communication, July 21, 2021; L.Y. Shi, personal communication). Overall, primary care facilities continue to have difficulty recruiting and retaining qualified healthcare professionals. This could be a key reason why many patients go directly to hospitals and skip receiving care in primary care settings.

6.1.3 Poor Compensation Levels and Perverse Financial Incentives

Poor compensation for primary care professionals in China is one of the key factors that help explain the persistent shortcomings in the nation's healthcare workforce at the primary care

level. Within the healthcare workforce, there is a wide variation in earnings, with GPs specifically earning the least (**Figure 9**). Average earnings in China's GPs rank the last among all doctors, at only 58% of the average annual compensation for physicians in the country.

FIGURE 9 Average Compensation of Physicians in China (RMB), 2020



Source: JOBMD.CN 2021

Note: General Medicine compensation based on the data – 95,800 in 2018 and calculated by annual 9.2% increase in the healthcare sector.

The compensation structure for physicians in China further contributes to the nation's unsatisfactory healthcare system. On average in 2018, the basic salary accounted for 15.6% of a physician's total compensation, allowances for 12.3%, and performance bonuses for 47% – which is 20% higher than the amount of basic salary and allowances (163.com, 2021). In response to these perverse compensation structures with higher bonuses, physicians often manipulate their patients' demands for in-hospital medical services, like admissions and

specialized procedures, to their own advantage. The perverse compensation structure also incentivizes doctors to increase the utilization of unnecessary tests, overprescribe expensive branded antibiotics on which they can obtain commissions, seek informal payments from patients (“red envelopes”), and perform private practice (“moonlighting”) to supplement their incomes. All these things can negatively influence the quality of care that is given.

Compensation is also varied across public hospitals at different levels. Earnings in first-tier city public hospitals are significantly higher than in second-tier, third-tier, and fourth-tier city hospitals. The average compensation in first-tier hospitals is 1.7 times that of second-tier hospitals (JOBMD.CN, 2021).

The large earning differences between public hospitals workers, GPs, and specialists are irreconcilable with the government’s focus on strengthening primary care. Low compensation makes it difficult for primary care facilities to recruit and retain good, well-qualified healthcare workers.

6.1.4 Restrictive Headcount Quota System

China’s healthcare workforce is managed by a policy framework that follows the healthcare sector governance structure—a headcount quota system. The headcount quota system is supervised by the State Commission Office for Public Sector Reform that is supervised by State Council, which is a restrictive human resources management arrangement system that defines the total number of healthcare personnel assigned to a healthcare facility. Filling open positions in healthcare facilities depends heavily on local fiscal capacity and local government’s willingness to develop the healthcare sector. Quota-based employees enjoy permanent employment, partial social security benefits, consistent incomes, and pensions. Healthcare

facility managers are often hesitant to fire these workers with a lifetime guarantee of employment.

In China's current quota system, for community health centers (CHCs), staff quotas are no fewer than three licensed GPs and one public health specialist per 10,000 residents, with a GP to nurse ratio of one (The State Council, 2006). Staffing quotas for township health centers (THCs) is generally about 1% of the total population in a geographical area; the actual number is more flexible because it can be calculated based on the ease of transport to the THC, and it depends on the fiscal capacity of the local government. This quota standard is re-evaluated and re-set by the local Organization Department every 5 years (NHC, 2018).

Under China's current quota system, the Local Commission Office for Public Sector Reform (LCOPSR) determines the quotes and sometimes restricts the creation of new quotas. The lack of autonomy held by healthcare facilities means they may not be able to hire new, needed staff. Likewise, the LCOPSR is responsible for recruiting new workers. However, the LCOPSR typically sets standardized qualifying examinations, recruitment processes, and evaluation standards that cannot fully match the health sector's unique needs.

The quota system has not been able to keep up with the pace the healthcare needs of China's population nor to sufficiently adapt to the ever-growing demand for healthcare services. Many issues related to quotas have been reported from healthcare providers across the country. For example, headcount standards for maternity and childcare were formulated in the 1980s and never updated (World Bank, 2019). Additionally, the restrictive quota system worsens the nation's current shortage of GPs and their workload. One GP who works in a second-tier city's GHCs in 2021 reported that she works at least 60 hours a week on average and sees 40 – 50 patients a day (Interview 1, 2021). The remainder of her time is taken up with tedious,

nonclinical paperwork and responding to patients via social networking platforms such as Wechat (China's equivalent of WhatsApp). Beyond overloading GPs, this causes the quality of healthcare to decrease and the possibility of conflict between GPs and patients to increase. The shifting needs of community healthcare centers cannot be met by headcount standards in China.

To respond to the significant quota shortages, healthcare facilities hire additional healthcare workers who are not within the quota. A recent survey of health facilities in 10 provinces conducted by the National Health Commission and Shandong University in China found that 15% of the employees in CHCs, with 11% in maternity and childcare institutions, and 8% in THCs who are not quota-based (World Bank, 2019). These employees have different contracts that provide lower compensation and no pension. The healthcare facilities have to pay these temporary healthcare workers' salaries and benefits out of their own revenues, even though these healthcare workers are not well qualified. This adds pressure on the healthcare facilities to generate extra revenue and simultaneously encourages them to overprescribe drugs and overuse diagnostic tests.

6.1.5 Entry into and Limited Mobility Healthcare Market

Law in the People's Republic of China of Licensed Doctors requires physicians, assistant physicians, nurses, and rural village doctors to obtain both a Qualification Certification (医师资格证) and a Doctor's License (医师执业证书). Healthcare professionals who qualify can take the national qualification examination. If they receive a successful score, they are given a physician, nurse, or pharmacist certification. These certified healthcare professionals can then apply for a license from the local Healthcare Commission, which authorizes healthcare professionals to deliver healthcare services in a particular healthcare facility.

Once healthcare professionals obtain these two certifications, they are qualified to work in healthcare facilities. The current recertification process in China is rather relaxed, thus it leaves little incentive for qualified healthcare professionals to improve their medical skills. Current regulations specify that nurses need to update their licenses every two years and that licensed doctors need to attend in-service training every two years (World Bank, 2019), but doctors do not have any specific requirements regarding recertification. Because the re-licensing process is not based on quality assurance measures, healthcare professionals normally do not comply. Although the entry-level of healthcare professionals is high, the very relaxed follow-up training policies ultimately contribute to low-quality healthcare services and patients' dissatisfaction.

Current healthcare labor laws further restrict the mobility of healthcare workers in the nation, thus impacting the supply of healthcare workers in the nation. This happens because doctor's licenses in China are linked with a specific healthcare facility where the healthcare professionals will work. The majority of licensed doctors work at public hospitals, which poses another obstacle for recruitment at primary care institutions.

To deal with this issue, the central government passed a new law regulating doctors in 2021 that allows a physician to practice in two or more clinics if they obtain permission from both their original healthcare facility and local Healthcare Commission. The physician must also agree to legal contract regarding liability allocation with all their places of employment (Xinhuanet, 2021).

Despite its promise, this regulation may have low participation rates and therefore not achieve its intended results because of physicians' workload, risks, and benefits. Due to high patient volume at public hospitals, physicians cannot manage a second place of employment.

According to a 2017 survey conducted by the Chinese Medical Doctor Association (CMDA), physicians in tertiary public hospitals averaged 51 hours per week, and fewer than 25% of physicians have taken their annual leave (Sohu, 2017). Further, due to the dual practice, the original healthcare facility where the physicians register is not responsible for protecting the physicians in medical disputes. Instead, physicians are accountable for any medical care accidents or disputes; this may further affect their career in the future. Physicians' income, benefits, title, pension, and research and training opportunities are linked to their place of employment under the current quota-based system. As a result, the physicians may be afraid that dual or triple practice will negatively impact their performance bonus and opportunities for promotion and clinical research and training.

6.2 Recommendations for Healthcare Workforce Reform

Primary care services in China are facing a workforce crisis. A sufficient, well-functioning healthcare workforce is essential to help China reach the national strategy known as "Healthy China" because this workforce can deliver affordable and effective high-quality healthcare at all levels to satisfy the population's healthcare demands and expectations.

Numerous countries that value and prioritized primary care have made unprecedented efforts in improving policies in educating, deploying, managing, and regulating the healthcare workforce in support of primary care. Examples include the UK's National Health Service (NHS), which placed GPs as the first point of contact for people with a physical or mental health problem, generating over 1.3 million GP consultations every day (NHS, 2021). Canada has a more balanced primary care-specialist physician ratio than the U.S. (Starfield, 2010). Other OECD countries, like Sweden and Australia, etc., have also implemented national-level strategies to improve primary care workforce and services. For example, by successfully

managing primary care physicians, the average length of primary care physician consultations in Sweden is 22.5 mins – the longest primary care physician consultations around the world (Irving et al., 2017).

To deal with the current issues regarding the healthcare workforce in China, it is necessary to understand how these representative countries have settled on a unique mix of policies and healthcare service delivery systems to provide primary care services and identify what features of their systems could be adapted within the context of China to improve its current system. The concrete recommendations for China, to be outlined next, are based on the review of these selected countries (e.g., Brazil, United States), which serve as a means to generate insights about the policies and practices that can help strengthen the healthcare workforce in primary care settings.

Precedent from other countries demonstrates that sufficient political backing and investment can greatly increase or improve primary care coverage. To ensure that this healthcare is not only adequate in numbers but also quality, it is necessary to promote primary care performance review and assessment at all levels of healthcare workers' careers, from basic healthcare education to consistent professional development throughout their careers.

After a thorough analysis of existing literature on this topic, four strategies to achieve such a workforce and professional culture have been identified. These include: 1) transform the healthcare professional pathway into one that better supports primary care workers; 2) improve the workforce composition and capability into one that meets the demand for primary care services; 3) revise the compensation system into one that offers desirable incentives for high performance; 4) change the headcount quota system into one that promotes a more adaptable labor market for healthcare and effective healthcare worker management.

6.2.1 Transform the Healthcare Professional Pathway into one that Better Supports Primary Care Workers

More Supportive and Improved Professional Pathway for Primary Care Workers

The government, healthcare workers, and the general public must be encouraged to rethink their perception of primary care to understand and treat it as valuable as specialty doctors. Agreement among these parties will improve the status of primary care workers and facilitate a more non-hierarchical view of how healthcare workers at different levels and in different roles work together to provide patient care.

A more competitive and supportive professional development pathway is crucial to building and keeping a primary care workforce. To create such a thing, first, the government should look at the UK's use of primary care as a gatekeeping device that directs the flow of patients into primary care first, and then GPs decide whether specialty or hospital care is needed. This gatekeeping structure has several benefits: advances GP's status among other doctors, increases the status of primary care, improves the efficient utilization and quality of healthcare services.

Over time, gatekeeping will become the standard across the country, which will then better allow for residents to sign with a family doctor. Starting in 2019, the Chinese government encouraged residents to acquire a family doctor. While over 30% of people are registered with a family doctor by 2017 (Shang et al., 2019), the number of family doctors remains low, as were the number of well-qualified gynecologists and pediatricians (Dai et al., 2021). To address the current lack of family doctors, gynecologists, and pediatricians at secondary or tertiary hospitals

could temporarily offer telehealth visits to the local populations and help train family doctors in primary care.

Some studies have shown that poorly trained healthcare workers are associated with delayed diagnosis and unfavorable outcomes (Greenfield et al., 2016). For instance, Richards (2009) documented that earlier diagnosis and appropriate treatment within 5 years of cancer diagnosis could avoid 5,000 – 10,000 fewer deaths in England (Richards, 2009). Another study found that European countries with robust gatekeeping structures have regularly had a lower cancer survival rate because of the diagnosis is inconsistent (Vedsted & Olesen, 2011).

Adopting this gatekeeping structure in China would mean addressing the issue of primary care workers in China having low levels of education and qualification. In 2018, only 25% of primary care doctors in CHCs and 42% of those in THCs centers had less than the required degree for a licensed assistant physician, i.e., a junior medical college degree. However, these numbers have improved since 2010, when 41% of primary care doctors at CHCs and 60% of those at THCs held less than a junior medical college degree (NHFPC, 2018). This improvement is likely an effect of the 2011 nationwide reform of graduate medical education (State Council, 2011), which prioritized education and training for family doctors. Since that took effect, there are three times as many qualified family doctors in China (100,000 to 300,000) (NHC, 2019). Despite the increase from 4% in 2011 to 13% in 2018 of qualified family doctors relative to the total number of doctors in China, there remains a shortage. The lack of qualified family doctors has resulted in over 20% of CHC and THC doctors being unlicensed (Li et al., 2017; Li et al., 2020).

Offer Professionalization Opportunities and Increase Payment to That of Other High-status Specialties to Advance and Attract Primary Care Workers

To create a more attractive and skilled primary care workforce, more career paths and incentives must be established for GPs, nurses, mid-level workers, and community healthcare workers. Further, the status of general practice must be advanced to match that of other specialties with regulated practice standards. In the Jiangsu and Sichuan provinces, there are pilot runs for a distinct accreditation system for rural assistant physicians and a distinct professional title-promotion system for primary care workers. These pilots should be assessed and potentially piloted more across the county (World Bank, 2019).

To achieve the aim of increasing payment to primary care workers, while China has devoted much more funding to primary care through a public health subsidy program, the country would need to allocate a substantial additional amount. One option is the government redistributing its yearly incremental health insurance financing toward primary care. Notably, China is reforming its health insurance policies to match a coverage plan like that of other countries by using subsidies. It is common for countries with universal healthcare to provide widespread coverage of preventive and primary care services, typically on a standardized copayment or high reimbursement rate model. In China, in 2015, the per capita subsidy increased from RMB 320 to RMB 380, and the per-person contribution went from RMB 90 to RMB 120. In turn, patients may be more likely to utilize outpatient services from primary care providers, thereby decreasing the overuse of hospitals and freeing up more funding for primary care.

6.2.2 Improve the Workforce Composition and Capability into One that Meets the Demand for Primary Care Services

Broaden the Skill Mix of the Primary Care Workforce and Establish Alternative Cadres of Healthcare Workers to Strengthen Primary Care Delivery

Broadening the skill mix in primary care to incorporate alternative cadres of healthcare workers from different disciplines, such as paramedicine, nursing, dietitian, nutritionist, and environmental health, embed into roles traditionally ascribed to GPs will present an opportunity to increase the resilience of the primary care workforce in China. Introducing new professional groups of nurse practitioners, physician associates, clinical assistants, and assistant doctors to support primary care teams will be cost-effective and efficient because these supportive multidisciplinary teams will reduce the demand on GPs and potentially benefit the delivery of healthcare services.

For instance, to improve primary care service delivery, one of the UK's target goals has been to introduce certain new professional and multidisciplinary groups in its primary care system. In England in 2019, the British Medical Association and the NHS proposed a England five-year plan that includes allocating 20,000 slots for allied health professionals, and supporting primary care by widening the scope of practice for allied health workers (Barker et al, 2021). These added professional groups have reduced GPs' workload and helped deliver medical care to homebound patients. Ambulance service clinicians, such as paramedics, have been playing a new role in making home visits to consult with patients who have less severe health concerns and issues. As such, ambulance service clinicians may be ideally placed to facilitate primary care home visits, which might reap potential benefits like easier access to home visits, less use of transportation for emergency services, longer, consultation visits (Booker, et al., 2019; Mahtani et al., 2018; Mason et al., 2007). This shift would also dramatically decrease of GPs' caseload and thus give GPs more time to manage other patient groups with complicated needs.

In addition to introducing new professional cadres, hiring non-clinical physicians to meet the growing needs and complexity of individuals and the local community to augment primary care team's ability is also important. Depending on need, members of this extended primary care team can include community healthcare workers (CHWs), behavioral health specialists, pharmacists, and social workers.

Community Healthcare Workers

Community healthcare workers (CHWs) is a cost-effective alternative to provide greater access to primary care and reduce costly hospital care. Brazil's Family Health Strategy (FHS) is a representative example that focuses on the use of CHWs. Like the Barefoot Doctors program in the 1960s, Brazil's FHS using strategically composed health teams to provide basic health and preventative care. These teams consist of a physician, nurse, nurse assistant, and four to six CHWs (Wadge et.al, 2016). Each team serves a geographic area covering 3,000 to 4,000 people, with a maximum of 150 families per CHW (Wadge et al., 2016).

The majority of CHWs are young women and are recruited to work in their own communities. To become a CHW, the minimum requirement is having completed secondary education, but 67% of CHWs have a higher education degree. While the federal government funds municipalities to pay CHWs at the minimum wage, additional pay and benefits are established at the local level.

In Brazil, CHWs are trained for three months and employed by municipal health authorities. Compared to physicians and nurses, the scope of CHWs' practice covers numerous primary care services, like public health screenings, triage, chronic disease management, and child growth monitoring, and referring patients with more complicated issues to the appropriate

professional (Macinko & Harris, 2015). They also spend their time at the community clinic, communicating regularly with nurse physicians, adding notes to medical records, and running health education sessions. These CHWs provide primary care within their territory, make house visits at least one time per month, and establish trust between communities and the health system (Lotta et al., 2020).

In response to the shortage of primary care workers, China may consider the possibility of integrating alternative cadres of primary care workers, especially CHWs, into the current primary care system. Overall, CHWs are unique in that they offer individualized and wholescale support in areas of social support, advocacy, coaching, and using the health system navigation (Seervai, 2020). To achieve this holistic approach, CHWs first begin to know patients for who they are as people, not medical histories. This includes identifying and fulfilling social and behavior needs that may impact one's health status of use of healthcare services. The use of CHWs could be adopted in China because not only can they revolve some low-level problems, like ensuring monitoring patient medication use or responding to patients via social networking platforms such as Wechat or Microblog, but also perform a wide range of tasks like routine home visits to improve chronic disease control and promote healthy behavior.

CHWs could also support immunization programs, conducting PCR tests for people during the COVID-19 pandemic, monitoring nutrition, and supporting child development and family planning. CHWs could perform these tasks in a variety of ways no matter their skill level. CHWs hold great potential to support their local community by focusing on the social determinants of health that may increase one's risk and severity of COVID-19 infection (Peretz el al., 2020). The pandemic should also motivate the government to give CHWs a greater role in the primary care system. This was the case during a COVID-19 lockdown in Shanghai; CHWs

partnered with community organizations to seek out and support socially isolated COVID-19 patients. Last but not least, China's aging population may also enforce the government to expand its tiered delivery approach from three to four tiers and provide health care and social support to elderly residents in their homes (Yip et al., 2019). The value of CHWs stems from their local knowledge and daily contact with families (Lotta et al., 2020). This proximity to communities is significant for noncommunicable diseases (NCDs) surveillance, risk communication, diseases prevention, and health education.

Integrating new primary care cadres and CHWs into primary care services may pose a number of challenges to the current healthcare system. The first challenge in adopting alternative cadres is the professionalism and accreditation of CHWs. Primary care practitioners struggle to satisfy the population in China mainly because healthcare personnel's health literacy in primary care practice is low, which was currently queried by the public. The government should develop evidence-based approaches to make sure the new primary care worker-CHWs are safe and effective and convince the population to accept their new roles. It calls the government's attention design an effective CHWs programs that include payment, supervision structure, appropriate caseload limits, holistic support approaches, community-clinical integration, and recruitment guidelines. The government can also look towards Brazil's FS model, especially how it recruited based on the community, and also use evidence from the UK (home visit practitioner) to adapt the role to China's primary care. Well-trusted and knowledgeable community members with a capacity to build strong relationships should be the targets for CHW. In China's context, the people who are currently working in neighborhood committees should be considered as the strong candidates contributing to developing CHWs because they share a common sociocultural

background and life experiences with the people in community and they understand the community and family context that affect the person seeking care.

The second challenge is ensuring sustainable and appropriate political stewardship and sufficient resourcing. CHWs require advocacy, stewardship, and direction from political leaders, local officials, and regional secondary and tertiary healthcare providers to be considered an integral part of health sector activities. Healthy China 2030 has focused on national efforts on shifting from treatment to prevention (Chen, et al., 2019) and recognized the value of primary care personnel in delivering effective care at a lower cost. This strong political will and momentum is expected to compel local governments to create and sustain an enabling environment for CHWs programs. Adequate resourcing is also crucial. Along with the increase of primary health service capacity, secondary and tertiary healthcare providers may see the greatest benefits through reduced hospitalization as they need to transfer more patients downward to primary care level facilities. An appropriate reimbursement model like a global budget that provides fixed payments to all providers on the geographical, organizational, and political periphery will offer greater financial certainty for secondary and tertiary providers. It will also dissuade the incentive to order more procedures than necessary, and these providers will have a greater incentive to explore cost-effective care and adopt preventive care which can be performed at the primary care level.

Third, China must develop strategies to integrated new healthcare workers within existing primary care teams and management; management that often neglects factors of CHWs. In integrated settings, the role of CHWs will be able to provide certain additional healthcare services like screening and immunization to prevent hospital admissions. However, if the CHWs program is conducted with ill-defined ownership and accountability, CHWs make perform tasks

that other primary care team members current performs. The overlap in the performance of primary care tasks among multiple providers will lower clinic efficiency. To ensure the appropriateness of task assignment in primary care, a careful, attentive, and sustained management of healthcare personnel is one of the most crucial factors.

Early implementation can be deployed in western provinces in China. Due to their greater needs, areas with more socially and economically marginalized people benefit more from the implementation. For instance, the poor region therein may have a sufficient number of GPs or nurses because the local authority ensures to meet the national guideline, but an insufficient number of other healthcare providers (i.e., dietitian, lab technicians); this hinders the ability of healthcare workers with varying scopes of practice to provide effective care. In addition, most of the western region in China consists of rural areas and small healthcare support programs. These programs are often effective because CHWs and the community itself perform supportive and supervisory roles. This allows the community to have greater control over how healthcare operates in their region and thus they are better suited to meet their unique community needs.

Pharmacists

Another key player in primary care is pharmacists; they work to provide efficient and effective medication-based treatments that is also safe and cost-friendly. Pharmacists will play an even greater role in coming years in response to the growing aging and chronically ill populations in China (WHO, 2015). Primary care teams and pharmacists can work together to avoid medication mismanagement and disjointed care services. This is a major issue. For instance, in the U.S., non-optimized medication therapy is a major cause of illness and death—over 275,000 preventable deaths (Buschman, 2018). The cost of non-optimized medication therapy is roughly $528.4 billion annually in the U.S (Buschman, 2018).

As those effects suggest, pharmacists have a unique knowledgebase, one that is essential to help patients through the entire medication use process, including creating an individualized plan, goal setting with the patient, and follow-ups. As such pharmacists can enhance the capability of primary care teams to prevent and manage disease and other conditions. There are numerous ways to involve pharmacists in primary care, such as in medical provider and community pharmacy relationships or telehealth services.

Despite the promise of involving pharmacists into primary care more, there is a lack of pharmacists in China who are qualified to make this transition. All secondary and tertiary hospitals must employ 3-5 clinical pharmacists, per the *Provisions on the Administration of Pharmaceutical Affairs in Medical Institutions*, but they often cannot meet this quota (Wan et al., 2022). The shortage is even dire in primary care settings.

Behavioral Health Specialist

Mental health is increasingly becoming a more pressing issue for the primary care system in China to address. The COVID-19 pandemic spurred growing rates of mental illness and other mental health conditions, especially in healthcare workers and patients (Ju et al., 2020). A survey of over 12000 Chinese citizens on the psychological toll of the pandemic on Chinese citizen reported that 53.8% of participants experienced moderate to severe psychological effects from the pandemic (Wang, 2020). Currently, mental health prevention and treatment is supported by the behavioral health workforce, which includes certified/licensed expert providers, case coordinators, and peer advisors. Behavioral health issues are also overseen by the primary care system because addressing the identification, diagnosis, and treatment of mental and physical health needs can promote more effective and competently holistic care (Anderson et al., 2015;

Foy et al., 2019; Hodgkinson et al., 2017; Miller and Druss, 2013; Miller et al., 2014; Reiss-Brennan, 2014; Reiss-Brennan et al., 2016; Wissow et al., 2016; Xierali et al., 2013).

China's pandemic-related mental health support programs should be expanded are not enough in the long-term and these services should be better interested into primary care settings in order to reach communities in need (Ju et al., 2020). Behavioral Health Specialists (BHSs) are well-equipped to offer more robust mental health services since they are killed in educating patients, patient communication, evidence-based practices, and coordination with primary care workers (Skillman et al., 2016). BHSs could engage in more training, education, and practice alongside primary care team members in order to enhance their capacity to support patients with comorbid mental and physical conditions and provide the needed treatment and management plan. Such a plan may include the use of evidence-based practices from psychotherapy and pharmacotherapy to treat mental and/or chronic conditions.

The increasing shortage of BHSs and other types of behavioral health workers currently prevent the widescale merging of behavioral health into primary care. For instance, there are only an estimated 30,000 to 40,000 counseling psychologists in China (CNR, 2019), and a mere 2.19 psychiatrists (registered) and psychiatric nurses per 10,000 people in China (Liang et al., 2018; Que et al., 2019). This issue partially stems from the absence of an official accreditation, registration, and licensing system (Yao et al., 2020; Xiang et al., 2012). Even if these workers were available, there is still the issue of funding. High out-of-pocket costs combined with low insurance coverage prevent many people from seeking mental health care and also poses barriers to bringing behavioral health into primary care (Xu et al., 2021).

In tandem with those above issues, there is a lack of clear direction to create a sufficient behavioral health integration model in China. China may learn from the U.S.' Veteran Affairs

who found that, after integrating behavioral health into primary care, primary care providers had difficulty serving smaller populations (Cornwell et al., 2018). Others who have attempted to describe such an integration model have stressed that behavioral health workers would need to first undergo more professional development and related education (Ramanuj et al., 2019; NASEM, 2020).

Social Workers

To achieve whole-person scale in primary care settings, social workers are critical for supporting patients beyond their medical histories and needs. Social workers may screen and evaluate patients, suggest behavioral changes, identify their social needs, assist them in accessing healthcare and other resources necessary for health like housing and food (Cornell et al., 2020). People with greater or more complex needs can benefit from social workers because they can develop manageable care plans that do not require people to enter hospital or nursing care. The obstacle to welcoming more social workers into primary care is regarding pay: public insurance programs do not cover services rendered by social workers. Therefore, public health funding in China may be an alternative source to fund social workers. One means of addressing this obstacle is to increase awareness of the multilayered value of social workers in healthcare, and how social workers can even improve health outcomes in primary care (Cornell et al., 2020; Rehner et al., 2017). Increasing awareness can motivate the changes needed to enable more whole-person care by giving social workers a more prominent and funded role in primary care.

New Primary Care Team Size

New primary care teams will vary in size and composition depending on various factors, including the degree and scope of their patients' social and health needs (L.Y. Shi, personal

communication, December 1, 2021); the status of available healthcare workers and community networks; and the quality of the institutional data measures used to distribute resources to various types of patients. These factors work together. No matter the complexity of population's needs, small teams that lack coherent structure or large teams without proper leadership are likely to be unable to meet the demands for whole-person primary care. Poorly composed and inadequately resourced primary care teams may also suffer from issues in communication, interpersonal relations, and a mismatch between their goals and that of patients, families, and communities.

Team size may be decided in various ways. Of these, a key strategy is to identify everyone in a given population, profile their needs, and assign each person to a primary care team. The panel is then assessed and changed accordingly on a regular basis (Bearden et al., 2019; McGough et al., 2018). This flexibility allows the primary care team to realize the team size needed to fit the panel depending on their needs. For instance, consider the Southcentral Foundation (SCF) Nuka System of Care in Alaska. Their panel ratio is roughly one team to 1,500 patients. SCF has a department that is responsible for overseeing empanelmentation, including patient transitions and navigating the switch, among other tasks (Gottlieb, 2013, PHCPI, 2019). In Turkey, primary care clinicians take a geographical approach to empanel patients. This promote universal access, and patients are allowed to change their provider later (PHCPI, 2019). Lastly, Costa Rica also takes a geography-based empanel mentation approach, assigning each person to an integrated health team, each of which is responsible for 4500 patients (Pesec et al., 2017).

In China, the team composition and panel size may vary to fix context. For a community of 10,000 people with a high elderly population, the primary care team may require more social workers because they are adept at delicate caseloads. Another community, also with 10,000

people, but more social needs, may demand a primary care team with more CHWs, BHSs, and other types of social support specialists. Despite the numbers in these examples, the ideal panel size is typically under 2,000 people. This enables more efficient work distribution and workflow and better patient-team member matching (Altschuler et al., 2012; Brownlee & Van Borkulo, 2013). In fact, as of 2016, there is greater capacity for China to motivate primary care workers to engage in the family doctor contract service (FDCS), and this could further promote the quality of primary care services and standards.

Implement Local-specific Training Programs to Retain Primary Care Workforce

It is common for healthcare workers from rural backgrounds to practice in rural areas after graduating from healthcare professional training. As such, decentralizing these training programs, particularly remote and rural areas, and recruiting local students may help more evenly distribute the healthcare workforce. In 2017, this strategy was introduced in Norway and dubbed the Finnmark model. This model puts emphasis on student participation, local community engagement, and community education. The goal behind this model was to develop students' cultural awareness and to use generalists as models (Olsen, 2022). In another example, the University of Toronto founded a family medicine residency program in an understaffed region just outside of Toronto. The program proved a success since a large proportion, about two-thirds of graduates of this program in its early years remained working in the region and expressed their satisfaction (Whittaker et al., 2019). Similarly, numerous Chinese provinces have built training programs to attract and educate medical students specifically to work in primary care and rural areas. Take Jiangxi province for an example. From 2015 to 2018, this province began started recruiting 200 high school graduates into three-year general medicine training programs. Not only did these students not have to pay tuition, but the provincial government also

gave them a financial subsidy (an annual RMB 5,000). These students are required to serve as general practitioners in rural THCs at least 6 years after completing their studies.

Regarding workforce qualifications and training, policies may need to adjust to the particularities and needs of a given local context. Rural THCs, for one, may have trouble recruiting and retaining primary care workers who have the standard eight years of training (five at medical school and three in residency). Urban hospitals may be more attractive to those highly qualified workers. For THC employment, reducing the qualifications to five years (three in medical school with vocational degree and two in residency, namely physician assistants) could prove helpful for building a sustainable physician workforce for THCs (W. Hsiao, personal communication, July 21, 2021).

Healthcare professional education and training must be revised to enable the current workforce to meet the demands of primary care. This change would include: 1) remodeling medical curricula to prioritize primary care capabilities; 2) modifying medical training program to include more experience with community-level, primary care, and team-based care; 3) connecting on-the-job service training with recertification.

6.2.9 Revise the Compensation System into one that Offers Desirable Incentives for high Performance

Increase the Portion of Primary Care Workers' Base Salary Relative to Performance Bonuses in Their Overall Compensation

Increasing the salary and addressing the pay structure of primary care workers is central to necessary to achieve high-quality primary care services. Primary care cannot be easily compared to other healthcare sectors; it has a unique potential to provide widescale

improvements in population health. Despite recent improvements, primary care workers are not paid at a competitive rate. In 2017, urban primary care saw a rise from 25% to 45% rise in share of direct government subsidies, and rural primary care saw one from 23% to 37% (Ma et al., 2019). Given the increased primary care funding, primary care workers were paid 2.5 times more on average, from $3910 in 2010 to $8272 in 2017 (Ma et al., 2019). Their total income is largely dependent on the amount of revenue they can produce for the healthcare facility where they work. For a typical GPs in urban community health center, her base salary composes a mere 24% of her entire income, and the rest composed of allowances (22%) and performance bonuses (54%) in 2019 (Interview 1, 2021). The National Health Development Research Center also conducted a national salary survey, and the inputs of public hospital primary care workers provide a notable comparison point for the primary care workers in community health center pay structure. Secondary and tertiary urban hospitals use a pay structure that is more disproportionate, with base salary at 14%, allowances and subsidies at 14%, and performance bonuses at 74%. The bonuses are connected to the hospital's total revenue.

Indeed, there are benefits to a mixed payment structure (fixed pay + performance-based pay). China and its healthcare workforce may better benefit from a compensation system that does not so heavily depend on hospital service revenue for determining and increasing bonuses, base pay, and allowances. The base pay is typically below 30% in China, which is significantly less than the norm found in most other countries, over 50%. As such, there is need for changes that lead to the allocation of adequate resources and incentives for primary care. For one, the Chinese government needs more effective data collection and assessment tools in order to first realize how money is being spent and to what ends. In tandem, the government could use this

information to cut unnecessary budgets and increasing the overall spending going to primary care, especially to the primary care workforce.

Align Base Wage Increases with Labor Market Trends to Promote Ongoing Recruitment

A primary care career would be more desirable and competitive in China if primary care workers were paid similar to those in well-respected specialties. Most all countries that prioritize primary care have correspondingly increased the compensation of this workforce. In Canada and the UK, for instance, GPs hold a more comprehensive role and are thus often paid more than specialists. This move improved the long-term supply of GPs. Brazil, Turkey, the UK, and more have overturned or ended the large difference in compensation between specialists and primary care physicians (World Bank, 2019).

China will need to increase primary care salaries in correspondence to shifts and needs of the overall labor market in the country. The data below presents the pay of primary care workers:

- UK: NHS salaried GPs earn between $70,656 and $ 106,625. GPs who run their own practices will usually earn more. GPs earn 3.1 times the average national salary (NHS, 2022)
- Canada: family GPs are paid twice as much as that of the top 10% population of highest income around the country (World Bank, 2019)
- China: general practitioners are paid less than 30% of the nation's top 10% average income level (World Bank, 2019).

Connect Income to Overall Performance Assessment & De-connect It from Revenue Production

Numerous countries in Europe contract GPs as independent vendors, attracting them by offering salary bonuses based on performance (Kringos et al., 2013). Another tactic is countries like Australia, Canada, and the UK incentivizing GPs to work with nurses in providing primary care. In the Sanming region of the Fujian in China, one can observe a successfully revised compensation structure (Appendix 2).

Australia is a strong example for China, as its healthcare system suffered from a fee-for-service until 1998 when the government implemented the Practice Incentive Payment program. This program offers incentives in three areas of concern and needs: care quality (especially for diabetes, cervical cancer screening, asthma, and indigenous people), rural area support, and improving patient volume capacity (Cashin et al., 2014).

As countries continue to test out new ways to motivate healthcare workers through pay incentives, compensation systems have grown to be more multifaceted in recent decades. These test runs have led to countries often applying a mix of payment schemes (e.g., fixed salary, performance bonuses, fee-for-service, etc.). Thus, in countries like Canada and France that largely run on a fee-for-service structure, other methods like performance bonuses and capitation (Belgium and France) are being added to encourage better care. The UK has adopted a pay-for-performance structure to motivate higher quality services. And countries like Finland and Sweden have added capitation and fee-for-service devices in addition to GPs being on a salary system.

To take a closer look at Canada, over the past decade, it has introduced alternative payment incentives and structures for physicians who prior were largely on a salary system. From 2004 to 2013, the number of physicians on a fee-for-service payment method decreased from 51% to 38%. More GPs operate on a mixed payment method than specialists (46% vs 37%).

Research has found some positive changes associated with mixed payment methods in Canada, particularly for preventive care, teamwork, and staffing and retention in regions with little population density (Wranik & Durier-Copp 2010). The new payment methods, however, have also increased payments and strained the finances of Canada's health system. Collective bargaining and public support have, together, rallied to increase the compensation of physicians. Likewise, physicians have had success acquiring higher salaries during healthcare worker shortages, which upset the public as users of the healthcare system and therefore motivated their support for higher wages for physicians.

6.2.13 Reform the Headcount Quota System to Advance the Primary Care Labor Market & Worker Management

Key to improving Chinese primary care workforce management, advancing hospital autonomy, improving primary care labor market flexibility, and supporting performance-centered financing policies is the widescale reform of the headcount quota system. In fact, the Chinese government is taking steps to undertake this reform. To achieve this reform, four related steps, at least, are needed:

Grant Managers Independence on Human Resources Matters

In order to end distinctions between workers with a quota post and those without, healthcare facility managers need the autonomy to address human resources matters and direct their staff not on quota but position. Every worker would agree to a uniform work contract with a healthcare facility. The contract would outline the authority, scope, functions, and responsibilities, scope, and accountability of the position in question.

While the government would retain the role of determining the types and grades of positions, healthcare facility managers would make decisions regarding position hiring and dismissal (if one fails to fulfill a contract), grades, technical credentials, and professional titles for their staff. Further, they would be held accountable for position-based recruitment, deployment, evaluation, wage setting, and training. The government would assess managers and hold them responsible for the overall staff performance of their health facility.

It is common for OECD countries to have both a centralized salary setting process and a decentralized recruitment process. Of these countries, 14 bestowed hospital managers with recruitment duties but set public hospital medical staff compensation at a national or subnational level (Buchan et al., 2014). Whereas in Australia and Portugal, public hospitals conduct recruitment and later obtain approval for hires from the central or subnational government (Buchan, 2015). In other countries, such as Italy and Greece, central or subnational governments undertake public hospital staff recruitment.

The medical staff directly bargain with public hospitals over work contracts in 19 OECD countries. Although this trend may be due to country-specific factors, and public hospitals are not necessarily deciding wages themselves. Notably, the three countries with hospital autonomy regarding wage levels (Poland, Sweden, and the U.S.) also have hospital-level contracts (Buchan, 2015; WHO, 2019).

Disconnect Licenses to Practice from Employment Facility

If China were to disconnect a physician's license to practice from their employment facility, this may improve the mobility and distribution of primary care workers. This change would be smooth in part to China's 2009 Physician Dual Practice Policy. This policy allows

physicians in the Guangdong province to work at any number of facilities as long as they have a shared understanding with each facility and record this information with their local health bureau. This policy is limited to that province and middle-level or above physicians.

Physicians being able to work at multiple facilities may affect the quality and quantity of care they can provide to the public, particularly being private sector jobs are often higher paid and have better working conditions. In several countries where this is allowed, doctors sometimes move their patients from a public hospital to private practice. In 2010, as such, Turkey made it illegal for doctors to work at multiple practices (except for university-based doctors) and increased public healthcare sector salaries.

Other countries place restrictions on the number of facilities and which type (public vs private) that doctors can work at simultaneously. The effectiveness of these interventions will differ by context, needs, resources, and the government's role.

Disconnect Primary Care Workers' Benefits from Both the Quota System and Healthcare Facilities

The mobility of primary care workers would be further improved by disconnecting their employment benefits from the quota system and their place of employment. In fact, this reform is in-progress since recent reforms disconnected pensions from the quota system and healthcare workers' place of employment.

Currently, a primary care worker's benefits are tied to the status of their employment at a given facility. As such, they lose their benefits if they leave their job. Previously, if they left their job, they would lose their pension too. Removing these constraints would increase the mobility of workers as they could carry their benefits and pension with them to another job.

Eliminating and Replacing the Headcount Quota System

In the long run, the headcount quota system must be eliminated in order to achieve sufficient management of the healthcare workforce and for doctors to become independent practitioners. To even enable such a massive change, other related reforms would first need to occur, particularly to the pension system, post-management system, title-promotion system, the government's monetary contributions, and the administration of clinical research and in-service training prospects (WHO, 2019). While these changes will take time, numerous test run programs have emerged.

State Commission Office for Public Sector Reform would need to be replaced, perhaps by professional associations, in several of the human resources management functions. Around the world, professional associations hold active roles in governance, frequently determining standards and assessing quality through licensing and accreditation processes. It is also common for professional associations to advocate for patients and represent members in creating legislation and strategies to set compensation. In this light, they could step in to oversee title promotions and ongoing professional development.

Increasing the role of professional associations in healthcare workforce governance may not be a perfect solution, as they could pose tensions with the wider healthcare system or aims in a given country. This was the case in Brazil when a professional medical association hindered reforms to expand nurses' scope of practice. China will need to think carefully about the role of professional organizations if they are to have a greater role.

CHAPTER 7

CONCLUSION

In the past, China has led the way in primary care and public health, particularly in rural area, in recent years it has tried to join more advanced countries in providing universal insurance coverage. A host of factors and interventions caused a dramatic reduction in mortality rates and overall improvement in health status. These include the Barefoot Doctors program, community or employment-based health insurance, and strategic public health campaigns, all of which worked in union with increased incomes, lower poverty rates, and improved living conditions. China's population enjoys a health status comparable to other nations with a robust economy (Guo, et al., 2019). As of 2019, in China, the average life expectancy is 77 years old, maternal mortality is 18.3 per 100,000 livebirths, and mortality of children under 5 years is 6.1 per 1,000 livebirths (Yip et al., 2019).

The hospital centrism and fragmentation of the 1970s and 80s continues to have aftershocks and negatively impact on primary care today. Chinese policymakers have taken notice and thus policies in the early 2000s health system reform projected the importance of primary care services delivered by community and township health centers, and village clinics in coordination with the rest of the healthcare system. Following this, a growth in community health services, in combination with improved NCMS and URBMI coverage and reimbursement, further affirmed the significance of primary care services.

Primary care has indeed gained more government attention in the last decade. The government released an official report, "Opinions of the Communist Party of China Central Committee and the State Council on Deepening the Health Care System Reform" in 2009, and this report expressed the government's commitment to primary care, regional health

improvements, and smoother organization of the health system at all levels (WHO, 2019). Following that report, more refined interventions have been made to promote the robustness of primary care. Of these, policies were introduced to construct more community-level health centers and devote more funding to training primary care professionals. The reforms, overall, shifted the very idea of primary care by stressing continuity of care and primary care as the patient's first point of contact in the health system.

Over the course of 2009 to 2012, the Chinese government devoted $19 billion to enhancing healthcare at the community level. This funding went to constructing and enhancing thousands of village clinics, and township and community health centers. The country has also invested in advancing the information systems of community level health centers and began to test run the general-practice model, a refined patient-referral system, and vertical integration. To complement, there are thousands of new primary care professionals as a result of newly implemented training programs. Existing primary care professionals have become more skilled as well, resulting from new, technical cooperation partnerships among hospitals and village clinics.

While there indeed has been progress, efforts to advance primary care have stunted in numerous ways. One, it is difficult to recruit and keep quality healthcare workers in community level heathcare centers. The current salaries and incentives cannot compete with that of health centers and hospitals in more urban areas. Second, current policy on hiring and budgets prevents the potential for a larger, better paid primary care workforce. Third, local governments have few incentives to work towards an integrated, re-organized primary care system. Current financial arrangements have spurred more competition between providers and motivated a greater capacity

for the quantity and complexity of care. This leaves little room for the much-needed cooperation and coordination.

As mentioned above, China is not just attempting to reform primary care; it is aiming for a widescale improvement in population health. The Healthy China 2030 plan is built on the notion that the nation can only achieve its economic and social goals by having a healthier population. The Healthy China 2030 plan takes a wide-angle approach to health and well-being beyond healthcare, attending to things such as disease prevention, nutrition and exercise, environmental health, and equitable resource access.

Healthy China 2030 is off to a strong start as the country turns towards an integrated model of primary care services. Healthy China 2030 will also enact major changes on how the healthcare workforce is trained, utilized, organized, and managed. In other countries, healthcare workforces that provide effective primary care have several shared qualities that China can learn from. This international experience demonstrates the importance of a more refined scope of practice and function, which can be used to organize the healthcare workforce organized; training workers in more relevant and broader skills and expertise; a variety of specialization-based teams; equitably distributing the workforce across each level and type of care; adopting fitted and desirable incentives; and advancing performance management mechanisms. To enact such changes in China as part of healthcare reform, the institutional, economic, and management frameworks organizing the healthcare workforce would need to change as well.

A well-trained and sufficient primary care workforce is critical to reaching the goal of Healthy China 2030. Towards this end, primary care needs could be better optimized, and their members could work more fully to their strengths and scope of practice. In particular, primary care teams would be enhanced by adopting the unique skills and knowledge of patients, their

families, primary care physicians, and community level healthcare workers. However, there is currently no universal or standardized framework for designing primary care teams, even though there is promising evidence that integrated team care is effective.

In sum, both long- and short-term changes in the healthcare workforce are needed to achieve a more effective and robust healthcare system in China. For the workforce, a broad but well-targeted reform is needed, including at the level of education, recruitment, distribution, assessment, payment structure, and management. The suggestions detailed here could support China's goal to improve the health system overall, as well as access to it, to ultimate make China a more modernized and healthier nation.

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APPENDIX 1

1. A General Practitioner in Second-tier City in China (personal communication, August 1, 2021)
2. A Hospital Dean in Tertiary Hospital in Second-tier City in China (personal communication, September 10, 2021)
3. A Professor of Health Policy & Management in China's University (personal communication, August 11, 2021)
4. A Senior Officer in National Health Commission in China (personal communication, October 6, 2021)
5. Leiyu Shi, Professor of Health Policy and Management, Johns Hopkins University (personal communication, December 1, 2021)
6. Sean Sylvia, Assistant Professor of Health Policy and Management, University of North Carolina – Chapel Hill (personal communication, August 16, 2021)
7. Shenglan Tang, Deputy Director of Duke Global Health Institute, Duke University (personal communication, August 20, 2021)
8. William Hsiao, K.T. Li Professor of Economics, Department of Health Policy and Management, Harvard University (personal communication, July 21, 2021)
9. Winnie Yip, Professor of Global Health Policy and Economics, Harvard University (personal communication, August 26, 2021)

APPENDIX 2

Sanming's Comprehensive Public Hospital Compensation Reform

In 2013, Sanming prefecture (Fujian Province) introduced comprehensive public hospital compensation reform with three major components:

1. New governance structure: The government appoints and pays hospital directors, and the directors are responsible for managing the hospital's daily operations. The government sets and uses yearly performance aims and tasks to assess hospital directors' performance.
2. New standards & requirements for hospital salary budgets: Since the Chinese government ceased the dependence on revenue generated from lab tests, physical exams, and pharmaceutical sales (including a zero-markup policy), three criteria have been introduced to distribute the sum of funds that can be used for salaries in each hospital in Sanming. These criteria include 1) The facility's labor-based medical services revenue, discounting lab tests, physical exams, and medical supplies; 2) Salaries that align with different types of hospitals' capacity to produce labor-based service revenue; 3) How highly the director performs per government assessment.
3. New salary structure: Every hospital staff member's salary is comprised of 1) Base salary determined by technical grade, seniority, and authority level/position; 2) Pay for what and how many services provided (e.g., number of outpatient exams, accounting for the complexity of patient diagnosis) 3) Bonuses relative to patient satisfaction rates, malpractice issues, extra hours worked, and emergency medical aid.