

# Challenges and Progressions towards Universal Health System and Healthcare System in China: A Literature Review

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**Abstract:** Universal health coverage (UHC) desires to deliver affordable and equitable access to preventive, curative and rehabilitative health services for the public. Chinese governments have emphasized the concept of health for all and have undertaken health system reform. This review will explore the strengths and weaknesses of China's health system based on six building blocks of the health system. Up-to-date studies have analysed governance, health services, health delivery, financing, information system and access to medical technology and products. Chinese health system assists health expenditure and expand insurance coverage in recent years. An increasing amount of health programmes aim to improve the accessibility of health services for people in remote China. However, medical practitioners with low education level in county hospitals ineffectively deliver health services. The lack of health technology has worsened the health conditions in economically disadvantaged areas in China. China's health system reform is in progression with improvements in policy reform, insurance coverage, technology development and health financing. Health service, workforce and delivery are significant issues in remote areas of China. It is not enough to deliver free health programmes, residents in rural areas are required to raise health awareness and modify the misconceptions on health.

**Keywords:** Universal health coverage, Health system, Health services, Health workforce, Governance, Health Equity, Primary health care

## 1. Background

Universal health coverage (UHC) is a desire for the population to access the health services they need without experiencing financial hardship due to payment for healthcare <sup>[1]</sup>, advancing equity, health outcomes and financial wellbeing <sup>[2]</sup>. WHO has defined UHC as a range of promotional, preventive, curative, rehabilitative, and palliative services consistent with Sustainable Development Goals (SDGs) launched in 2015, aiming to promote global health <sup>[1]</sup>. UHC also targets to provide an equal and human rights-respecting universal health plan that allocates health services based on personal needs <sup>[3]</sup>. *The Lancet* Commission on Investing in Health (CIH) supports that UHC is beneficial for poor populations to access services and provide financial protection <sup>[2,4]</sup>. Currently, UHC works in synergy with global health security, primary health care and health systems, but lacks considering the relationship between UHC and public health <sup>[4,5]</sup>. Even though UHC incorporates promotional and preventive health services, it focuses on providing individual services rather than public health services. Public health provides more valuable health interventions than curative services, suggesting that strengthening UHC related to public health would promote equitable health benefits to the public <sup>[4,5]</sup>.

The aim of UHC is not only to improve the population's health status but also to enable adults to employ and have a stable income, as well as provide education opportunities for children, resulting in fewer people in poverty <sup>[1]</sup>. UHC contributes to the low expenditure on health services and thus prevents individual financial hardship, which assists people to "enjoy the highest attainable standard of health" <sup>[1]</sup>. Achieving the goals of UHC requires a health financing system that is financially secured and health systems that function properly <sup>[1]</sup>. World Health Report 2012 revealed that more than 80 countries have requested technical assistance from WHO for modifying the health financing system with objectives of raising sufficient funds and spreading the financial risks across populations through prepayment and pooling <sup>[1]</sup>. Healthcare services delivery primarily covered in health systems guarantees access to integrated healthcare services, the provision of essential medications and technologies for diagnosis and treatment, and adequate financial funding for health promotion services <sup>[1]</sup>.

A growing number of low- and middle-income countries (LMIC) are introducing and implementing the UHC strategies. Although various approaches to achieving UHC as “no one size to fit all” proposed by WHO [6], LMIC share the experiences of implementing health coverage from different political backgrounds. Chinese health system reform strategies have more remarkable effects compared to LMIC pursuing universal health. Chinese health system planned to provide affordable and equitable access to health services for the population until 2020 [6, 7], which is aligned with WHO stating that “health for all” is “one of the basic rights of every human being, without distinction of race, religion, political belief, economic or social condition” [1]. Over the past 45 years, China’s growth in health funding has contributed to lifting more than 85 million people out of poverty, achieving the Millennium Development Goals (MDGs) in 2015 and increasing Chinese life expectancy [6, 8].

The People’s Republic of China (PRC) occupies about 9.6 million km<sup>2</sup> with the most population of 1.4 billion in 2021 [6], the urban population stands for 58% of the total Chinese population [6]. It is difficult to provide efficient health services to a large number of populations. In remote areas of China, the prevalence of “barefoot doctors” in the 1970s who were non-professional health workers provided preventive and basic health services [9] contributed to the growth of life expectancy from 35 to 68 years and the reduction of infant mortality from 200 to 40 per 100,000 newborns [9], despite storage of medical resources. However, public health and preventable services were no longer a priority for economic development in China in the 1980s, leading to the elimination of free rural clinics and low-cost health services [9, 10]. From 1978, the Chinese health system supported the transformation from public to private funding, restructuring of public hospitals into commercial enterprises, ownership of healthcare management by local governments and an introduction of pricing policy for medical facilities [6, 11]. Therefore, medical resources expanded and medical technology developed. However, the local government spent less on health services resulting in expensive health services and a decline in insurance coverage [11, 12]. Chinese government initiated a new phase of health system reform in 2009, achieving basic healthcare coverage for all Chinese population, focused on healthcare services, medical services, health insurance, and pharmaceutical supply in 2020 [6]. However, there were significant disparities in health services and individual health conditions between urban and rural residuals. In addition, insufficient health funding drove public health service providers into market competition, led to the growth of healthcare costs and compromised the equity of healthcare service [6, 13].

This review will reflect on the presented literature and analyse the weakness and progressions of the Chinese health system based on six building blocks of the health system and discuss recommendations for future Chinese healthcare development.

## 2. Methods

### 2.1 Search strategy and selection criteria

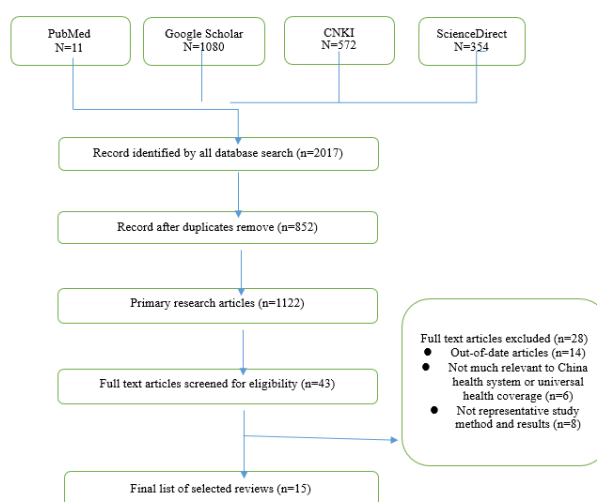


Figure 1: This diagram indicates the study selection procedure on challenges and progression towards the development of universal health coverage and health system in China.

Papers published in Chinese or English language from 2010 onwards were retrieved on PubMed, Google Scholar, CNKI (China National Knowledge Infrastructure), and ScienceDirect to identify the six

building blocks of the health system (service delivery, health workforce, health information system, access to essential medicines, financing, leadership/governance) in China. Keywords used for searching were “China”, “Universal Health Coverage”, “health system”, “health services”, “health workforce”, “governance”, “low- and middle-income countries”, “reform”, “equity”, “primary healthcare”, “financing”, “essential medicines”. The date of the last search was 28 May 2023. Papers are not conducted in China, concerned with UHC and the health system, or published prior to 2010 excluded from the literature selection. Studies must be published on the professional database for ensuring the validity and reliability of study results, excluding drafts and work-in-process. Quantitative studies, such as surveys, questionnaires, and interviews, need to describe at least 1,000 populations. Studies with unsystematic methods are also excluded.

11 studies from PubMed, 1080 from Google Scholar, 572 from CNKI, and 354 from ScienceDirect were selected. Studies and reviews that are not meeting the inclusion criteria and duplicates are excluded. 43 studies were eligible and then excluded 28 studies due to out-of-date, irrelevant to the Chinese health system and universal health coverage and not having representative study methods and results. Consequently, 15 studies have been selected (Figure 1).

### 3. Results

*Table 1: List of studies for universal health coverage (UHC) and health system in China 2010-2021.*

	Study/sources	Challenges	Opportunities
1	10 years of health-care reform in China: progress and gaps in Universal Health Coverage [14]	Gaps in quality of care, control of non-communicable diseases, health delivery.	Improvements in health care accessibility, health financing and help people in poverty.
2	Engaging sub-national governments in addressing health equities: challenges and opportunities in China's health system reform [15]	Income disparities, weakness in health financing and delivery.	Increased health expenditure of government expenditure, improved governance, and financing of public health delivery.
3	The development and reform of public health in China from 1949 to 2019 [16]	Have new opportunities to public health, such as NBSPHP for priority	Poor integration among service items and IT systems, lack of health professions.
4	Quality of primary health care in China: challenges and recommendations [17]	Suboptimal education and health training for primary health care practitioners, poor regulation on payment system, and insufficient continuity of care.	Strengthening primary health care system for prevent chronic diseases.
5	Universal Health Care Coverage in China: Challenges and Opportunities [18]	Local governments focus on economic development, rather than health care delivery. Disparity in rural and urban areas makes governments difficult to sustain resources for health care system.	Improve the policy making for public satisfaction. Increased health finance support for health sectors as developing economics in China.
6	COVID-19 and healthcare system in China: challenges and progression for a sustainable future [19]	Medical reimbursement, willingness of clinicians and hard to drug delivery. Online healthcare is not integrated into medical education.	Utilization of high technology, such as 5G and cloud computing to adopt innovative and advanced system. Health system integrated with new forces is essential for unknown infections in the future.
7	Geographical tracking and mapping of coronavirus disease COVID-19/severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic and associated events around the world: how 21st century GIS technologies are supporting the global fight against outbreaks and epidemics [20]	Inability to protect personal privacy, restriction of freedom and low public satisfaction.	GIS with real-time mapping of population travel data, tracing and mapping super-spread trajectories. Providing effective epidemic monitoring and response.
8	Health Care in China: Improvement, Challenges, and Reform [21]	Insufficient use of healthcare resources, not good use of disease management guidelines, inadequate health care insurance system and medical care system.	Rapid growth in economy and social development increased the health care demands and expenditure.
9	Health system reform in rural China: Voices of health workers and service-users [22]	Fast growing medical costs, imbalance of services between outpatients and inpatients, loss of autonomy for doctors. Flow of patients into county hospitals at a greater cost.	Salary reform for health workers, transparent drug procurement, rural health workers feel remunerated.
10	Assessment of Medical Service Pricing in China's Healthcare System: Challenges, Constraints, and Policy Recommendations [23]	Providing excessive diversity and specification of medical services, and price inelasticity of patients' demand. Inadequate capability of medical institutions and administrations.	Have advanced performance-based payment to medical staff in public hospitals and constructing a Sound Information Disclosure Mechanism.
11	Towards universal health coverage: lessons from 10 years of healthcare reform in China [6]	Chinese health system reform has achievements in health insurance system, public health service system, medical service system.	Chinese health system needs improve political support, health financing and a strong primary health care system.
12	China's Healthcare System and Reform [24]	Have an uneasy balance between market-driven approach and governmental regulation.	Have considerable attention on chronic illness, public health and long-time care and economic security for elderly population.
13	Strengthening public health services to achieve universal health coverage in China [25]	Policy is less associated with quality of public health services and management of NCDs.	Policies have improved insurance coverage and disparities between low- and high-income areas.
14	Controlling cost escalation of healthcare: making universal health coverage sustainable in China [26]	Requirements for control demands for health care.	Improvements in financial inputs to health insurance systems, the cost of healthcare system, and total health expenditure.
15	Insurance status, inhospital mortality and length of stay in hospitalised patients in Shanxi, China: a cross-sectional study [27]	The lowest adjusted inhospitable mortality rate observed in urban employee-based basic medical insurance. Little focus on disparities in health outcomes among health insurances.	UHC in China improve the access to healthcare services. Policymakers adjust the reimbursement policies of some expensive treatments.

This literature review explored the challenges and progressions towards universal health coverage and health system development in China based on the 15 existing articles. A summary of objectives, challenges and strengths for each study is shown in Table 1.

### 3.1 Governance

China's ten-year progression of health system reform has two phases of insurance expansion and infrastructure development from 2009 to 2011 and health service delivery reform from 2012 onwards [14]. Chinese government doubled health expenditure during the first phase of health system reform for funding health subsidies and primary health care (PHC) facilities [14]. While expanding and increasing the utilisation of social health insurance (SHI) coverage, no protection against financial risk due to poor management of the healthcare delivery system and profit-driven health system in China [14]. Specifically, China's health system was hampered by bureaucratic politics and conflicting policies regulated by multiple governing ministries [14]. Health workers' compensation was tightly related to profits of healthcare sectors, therefore medical practitioners overprescribed expensive medicines and tests rather than focusing on disease prevention and treatments [14, 22].

Chinese government initiated the reform of public hospitals and PHC-based integrated health delivery system in 2012, aiming to address inefficiencies of health delivery and eliminate conflicting pricing policies [14]. Chinese government authorised county and city hospitals to implement a Zero-Markup Drug Policy [14], specifically by increasing service fees for health providers and decreasing diagnosis fees. To compensate for the lost revenue from drugs and financial imbalance during the reform period, governments increased the fiscal subsidies for health sectors and hospitals increased the fees for diagnostic tests and PHC [22, 26]. However, policies were not implemented effectively due to difficulties in governing urban and rural hospitals as many hospitals in China.

In 2018, China's national healthcare governance was reorganized with the establishment of the National Healthcare Security Administration (NHSA) [23], which is responsible for managing the Urban Employee Basic Medical Insurance Programme, the Urban-Rural Resident Basic Medical Insurance Programme, Medical Assistance Scheme for low-income families [23] and for determining the price for health facilities and medicines. China's National Health Commission is continuously responsible for regulating the healthcare delivery system and additionally responsible for elderly care and tobacco regulation [16].

### 3.2 Financing

The Chinese government issued a new health insurance scheme in 2012, planning to improve the insurance benefits and unify the health insurance schemes [15]. China's central government and sub-national governments increased the number of vertical public health programmes from 10 to 44 and raised the budget from RMB 1.03 billion (US 146 million) to RMB 22.01 billion (US 3.11 billion) [15]. Health sectors have paid for public health programmes associated with hepatitis B, folic acid deficiency, fluorosis, cervical and breast cancer, cataract treatment, and rural water sanitation [15]. The national government also paid for programmes that attempted to fill the gaps between urban and rural health systems, which consist of three types:

- (a) programmes for providing subsidies for hospital births for rural pregnant women; vaccination programmes; the above six public health programmes; nine-year compulsory education support [15];
- (b) payments for social protection, targeting health insurance schemes and cash transfer schemes for people in poverty or population with specific needs [15]; and
- (c) infrastructure investment, such as water and food sanitation and rural road construction [15].

Approximately 50% of national government earmarked transfers are spent on health insurance costs, 30% on the infrastructure of health facilities, and 10%-16% on public health services [15]. Health facilities infrastructure, especially rural and PHC facilities, reduce the healthcare disparities between urban and rural areas [25]. Health delivery, health insurance enrolment and healthcare accessibility improved significantly after increasing health financing for promoting the health care programmes nationally [25].

### 3.3 Health Workforce

A lack of grassroots health workforce in rural areas of China has become a major issue in developing China's health system. Doctors and nurses are unwilling to be employed in most grassroots health sectors and hospitals in remote China, therefore hindering the development of an effective health workforce in economically disadvantaged areas [16]. Consequently, the State Council published a plan in 2018, which stipulated 2 to 3 general practitioners for every 10,000 inhabitants by 2020, then developed 5 general practitioners for every 10,000 inhabitants by 2030, to be delivered through recruitment and training of

health professionals in rural areas of China<sup>[14]</sup>.

Low PHC workforce mostly exists in rural China, yet low education levels and qualifications for health providers are a national issue. In 2018, 25% and 42% of PHC doctors and nurses in community health centres and township health centres respectively had qualifications under the college level<sup>[21]</sup>. Despite the Chinese governments focus on health training since the 2011 health system reform, qualified family doctors occupied a small percentage of all PHC doctors in China, approximately 18% in 2018<sup>[17]</sup>. This issue is worse in community and countryside health centres, where around 20% of doctors are unlicensed<sup>[17]</sup>. Additionally, Chinese health institutions have published a number of medical and health guidelines, but no authoritative guidelines for common diseases issued<sup>[17]</sup>, resulting in a substantial gap in the health training of PHC healthcare workers.

### **3.4 Service delivery**

Failure to integrate the basic public health services and essential medical services in China is reflected in low integration among health services package, and the inability to incorporate the service delivery between general practitioners and public health workers when regulating non-communicational diseases (NCDs)<sup>[24, 26]</sup>, so the efficiency of the Chinese health system and service delivery were impacted.

The Chinese government issued the National Basic Public Service Specification 2017<sup>[16]</sup> containing 55 items in 14 categories, such as vaccination, mental health care, elderly health management, NCD management, and health promotion. Besides the health records for the whole population, maternal, children and elderly health management was lack of separate records<sup>[16]</sup>. Information technology (IT) systems are varied and out-of-date in some Chinese provinces which contributes to incompatible electronic medical record systems in PHC<sup>[16]</sup>, leading to barriers to information sharing across institutions and regions. For instance, departments used different and isolated tracking systems to monitor environmental public health<sup>[16]</sup>, leading to a lack of information sharing and knowledge gaps between environmental sectors and public health sectors in China<sup>[24]</sup>.

China's essential health service delivery system mainly concentrates on physical health, ignoring mental health associated with social, environmental, and ethnic factors. Cross-sectional health programmes that integrate health sectors with non-health sectors, such as transportation, agriculture, and education, are required to deliver physical and psychological health among Chinese populations<sup>[24, 26]</sup>.

### **3.5 Access to Medical Products and Technologies**

Since the SARS outbreak in 2003, national and local governments have strengthened the disease prevention system and health surveillance system<sup>[16]</sup> by implementing National Basic Public Health Service Programme (NBPHSP) and National Expanded Programme on Immunization. Two programmes covered completely free vaccines in 2005, then increased 6 free vaccines to 14 for preventing 15 diseases, such as smallpox and neonatal tetanus in 2007<sup>[16]</sup>. In 2008, vaccinations of BCG, DAT, Pertussis and Tetanus, Polio, Measles, and Hepatitis B were covered in immunisation programmes<sup>[18]</sup>. Despite the universal vaccination coverage had been improved, for instance, neonatal vaccination was predicted to prevent about 30 million chronic hepatitis B carriers<sup>[17]</sup>, vaccination coverage for DAT, Pertussis and Tetanus in poor areas of China was lower than the average level<sup>[18]</sup>.

Chinese governments and health sectors support the establishment of online hospitals for providing online medical services in response to public health emergencies. Internet hospitals such as WeDoctor and Alibaba Health are platforms of approved telemedicine services through the internet for consultation, treatment, diagnosis, and prescriptions<sup>[19]</sup>. During the Covid-19 epidemic, internet hospitals relieved the overcrowding and insufficient health staff in physical hospitals<sup>[19]</sup>. In addition to reducing the risk of cross-infection, online hospitals balance the distribution of health resources. Patients from rural areas can access to the same medical services as those from urban areas<sup>[19]</sup> at a low cost. Additionally, doctors in online hospitals address mental health issues and provide both psychological and physical health recommendations for overcoming geographic hinders<sup>[19]</sup>.

Physical hospitals utilised artificial technology (AI) and 5G for service delivery and sanitation in isolation wards. AI-couple point-of-care (POC) is used to screen patients' health conditions and prevent virus<sup>[19, 20]</sup>. AI detected the pandemic virus in 20 seconds with 96% accuracy, which was faster and more efficient than 15 minutes of manual testing<sup>[17, 19]</sup>.

### 3.6 Information System

Chinese government promoted a geographic information system (GIS) during the SARS-CoV epidemic and seasonal influenza periods, showing real-time mapping of disease cases, disease transmission, predictive risk mapping, and information about disease dynamics<sup>[20]</sup>. In 2020, an app, Close Contact Detector, was launched by the National Health Commission of China and China Electronic Technology Corporation to inform people if they have had close contact with infected people in the past two weeks<sup>[20]</sup>.

GIS effectively detects health conditions, but primary healthcare sectors such as rural clinics have not built a Residents Health Record System and an Electronic Medical Record for clinical healthcare to facilitate patient referrals from rural clinics to secondary and territory hospitals<sup>[17]</sup>. Moreover, National Basic Public Health Service Programme was not integrated with clinical care delivery, making hinders to use health data for effective clinical practice<sup>[17]</sup>.

## 4. Discussion

China is committed to achieving universal health as a long-term goal, following the statement of WHO to provide an affordable and equative health service to the public. Chinese governments have improved health governance, health financing, service delivery, workforce, medical technologies accessibility and information system through health system reform, but disparities in health care services between urban and rural areas exist.

First, China's health system reform governed the close relationship between health workers and medical policies, regulated the prices of medical facilities and medicines, and improve the responsibility and efficiency of medical services. China's health system was poorly managed during the early reform period, so not addressing the variance in prices of medicines and the low revenues of rural hospitals. NHSA was subsequently established to manage the national health insurance and prices of medical products, with a particular focus on rural health insurance. Second, health financing was increased for expanding health insurance programmes and public health programmes. Chinese governments proposed strategies and programmes for pregnant women in rural areas, people in poverty, and rural construction. Third, the Chinese State Council has emphasized the employment of health professionals to work in rural areas to increase the health workforce in remote areas. However, low education level for healthcare staff is a national issue. So, rural hospitals and health sectors require authoritative and qualified primary health care staff and rural health staff need to strengthen practical health training. Fourth, public health services and public health services are not integrated, and health sectors have different information systems, leading to a lack of information sharing. Fifth, national universal health care covers free vaccinations which treat 14 diseases to improve vaccination coverage in the whole country but is low in poor areas of China. The establishment of online hospitals alleviates too many patients in physical hospitals and patients in remote areas access to the same medical services as patients in urban areas. Sixth, Geographic Information Systems and Close Contact Detector are widely used during epidemic periods to provide real-time information about virus transmission.

Presented literature has suggested that the Chinese health system is progressing, but health care in rural areas is unequal and inefficient. Rural areas lack of medical workforce with high education levels, lack of advanced technology and low accessibility of health services. The effects are minimal Despite Chinese governments implementing health care programmes in remote areas. Rural residents are poorly educated so that a lack of scientific health information. They have low household incomes and fewer job opportunities, so health is not a priority. Additionally, they may not understand new technology, such as online hospitals. Culture has solidified their mind, so remote residents are hard to accept new health knowledge.

Reforming the health system in China to achieve universal health coverage is a long duration and tough work, especially reforming the healthcare delivery system in remote areas. Developing health technology, increasing access to health programmes, and improving health policies are necessary. Building trust between health workers and residents in remote areas for promoting health services and monitoring health conditions are required. Therefore, developing universal health services in remote areas not only provide financial subsidies and free medical programmes, but also change their misconceptions about health for accessing equative health services.

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