



Systematic Review

The status and challenges of primary health care in China[☆]

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ABSTRACT

This article systematically reviews the development of primary healthcare (PHC) in China over the past 45 years, using data from the “China Health Statistics Yearbook” for 2010–2012, the “China Health and Family Planning Statistics Yearbook” for 2013–2017, and the “China Health Statistics Yearbook” for 2018–2022, along with 2023 World Bank data on infant mortality rate, maternal mortality rate, and average life expectancy for China and upper middle income countries. The development of PHC in China is divided into four stages, and the achievements included the gradual improvement of the PHC network, universal coverage of basic medical insurance, and the expansion of basic public health services in scope and funding. There has been a steady increase in family doctor contracting percentages and continuous improvement in the health status of women and children, ranking key health indicators of China among the top of upper-middle-income countries. Current challenges include imbalanced infrastructure development in PHC, a declining proportion of medical insurance funds, lack of vitality in operational mechanisms, and low salary levels and imperfect incentive system. This paper summarizes the international experience relevant to primary health care and proposes future development strategies in China.

The World Health Organization (WHO) is supporting in developing primary healthcare (PHC), considering it a crucial means to achieve universal health coverage, Sustainable Development Goal 3 (SDG3), and health security.¹ PHC in China has a long history with distinct features, exemplified from the early 1950s to the late 1970s by the tertiary prevention network, “barefoot doctors”, cooperative medical systems, and the integration of traditional Chinese and Western medicine—distinctly Chinese experience at the time.² This article reviews the development of PHC in China since 1978 (reform and opening up), summarizing over 45 years of progress and achievements. It analyzes the current challenges faced by PHC, draws lessons from international experiences, and proposes future strategies for development.

Development history and achievements of primary health care in China

Development history of PHC in China

PHC is based on practical, scientifically sound, and socially acceptable approaches and technology. It is made universally accessible to individuals and families in the community through their full participation and at a cost that the community and the country can afford to maintain

at every stage of development.³ In China, PHC has been nearly synonymous with rural health services. From the early 1950s to the late 1970s, a tertiary prevention network at the county, township, and village levels was progressively established in China. It trained “barefoot doctors” suited to the socio-economic conditions and health care needs of rural areas at that time and developed a rural cooperative medical system. These three aspects were once hailed as the mainstays of China’s rural health services, providing rich practical experience for implementing PHC in developing countries. While rural health service was being developed, urban PHC also achieved significant results, although with support systems and service methods differing from those in rural areas, reflecting the characteristics of China’s urban-rural dual social health governance.

In 1978, WHO and the United Nations Children’s Fund (UNICEF) issued the Alma-Ata Declaration. In the same year, China’s socio-economic landscape entered a critical phase of ‘reform and opening up’, presenting both significant opportunities and challenges for health care system and PHC in China. Since then, the evolution of PHC in China can be divided into four stages: (1)1978–2000: The era of “Health care for All,” focusing on providing basic health services accessible to the entire population. (2)2000–2009: Comprehensive implementation of the rural PHC development outline. (3)2009–2018: Coordinated urban and rural

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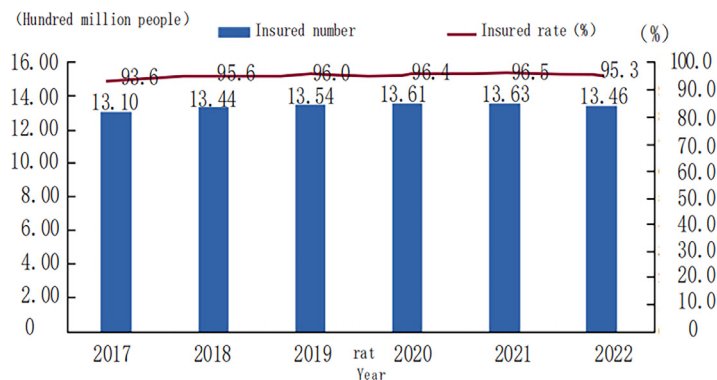


Fig. 1. The number and participation rate of China’s basic health insurance from 2017 to 2022.

efforts to establish a basic medical and health system as part of deepening health care reform. (4)From 2018 to the present: Comprehensive advancement of the Healthy China initiative, with ongoing deep reforms to continuously improve the quality of PHC.

Achievements of PHC in China

PHC infrastructure in China has gradually expanded. By the end of 2022, China boasted approximately 37,000 hospitals, 979,800 primary care facilities, and 12,400 specialized public health institutions. Primary care facilities, including community health centers/stations, township health centers, village clinics, outpatient departments, and clinics, accounted for 94.9 % of all medical institutions.⁴ Over 68.0 % of community health centers/township health centers met the national “high-quality service in primary care” standards.⁵ Additionally, 90.0 % of families could reach the nearest primary care facility within 15 min.⁶

Various types of basic medical insurance cover the vast majority of urban and rural residents. China has established a multi-level medical security system that includes universal basic medical insurance, supplementary health insurance, and medical assistance. By the end of 2022, the number of individuals covered under basic medical insurance reached 1.346 billion, maintaining a stable coverage rate of over 95 % from 2018 to 2022,⁴ essentially achieving universal basic medical coverage (Fig. 1).

The quantity and quality of PHC staff have been gradually improved. In 2022, the PHC workforce reached 4.5506 million in China, marking a 62.24 % increase from the 2.8322 million recorded in 1985. Since 2011, when China began to establish a general practitioner system, it has significantly accelerated the training of these professionals. The number of qualified general practitioners (GPs) rose from 109,800 in 2012 to 463,000 in 2022. The ratio of trained GPs per 10,000 people climbed from 0.81 to 3.28, and the number of GPs who are working in the PHC settings per 10,000 people increased from 0.65 to 2.77 (Fig. 2). In 2022, the proportion of practicing (assistant) physicians with a bachelor’s degree or higher in community health centers and township health centers reached 58.8 % and 33.6 % respectively, an increase of 1.3 percentage points and 2.3 percentage points from 2021, and an increase of 28.1 percentage points and 24.8 percentage points from 2009, respectively. The quality and capability of the health staff in village clinics have greatly improved, with more than 80.0 % having a junior college degree or higher. The number of practicing (assistant) physicians in village clinics increased from 107,200 in 2010 to 252,000 in 2022, and the proportion of practicing (assistant) physicians among rural doctors increased from 9.4 % to 28.1 %. Including those assigned by township health centers, this ratio reached 44.0 % (Fig. 3).

Expansion of basic public health service content, funding, and coverage has been increased in China. Since 2009, China has been providing residents with an increasingly comprehensive package of basic public health services, expanding from 9 categories to 12 categories of

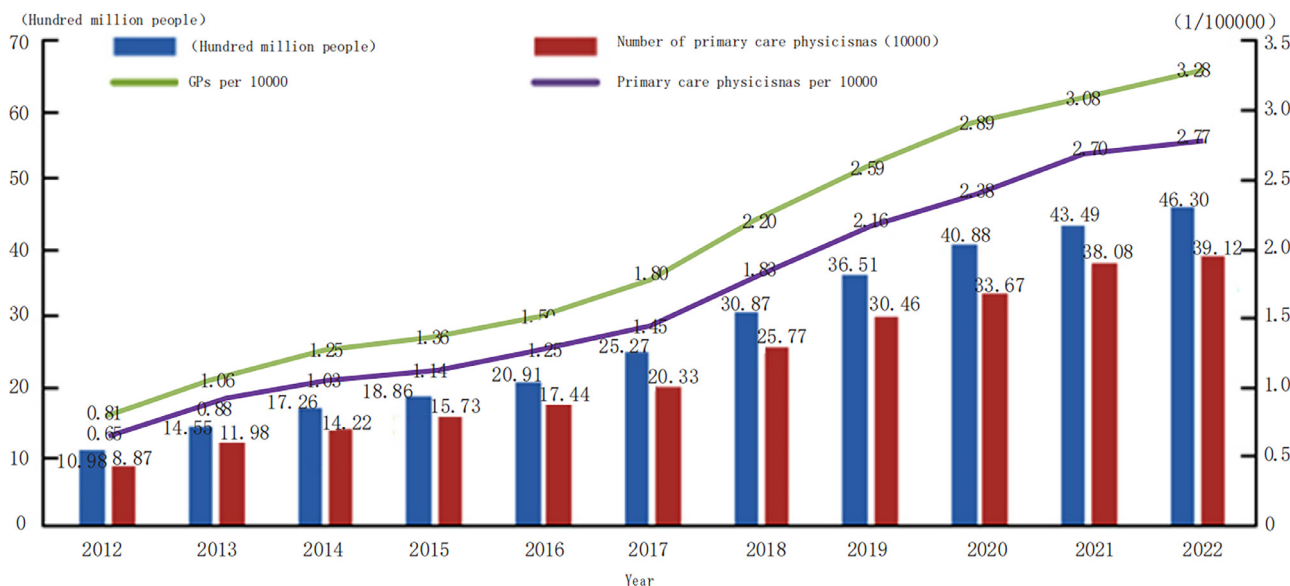


Fig. 2. The total number of general practitioners and the number of general practitioners per 10 000 population in China from 2012 to 2022.

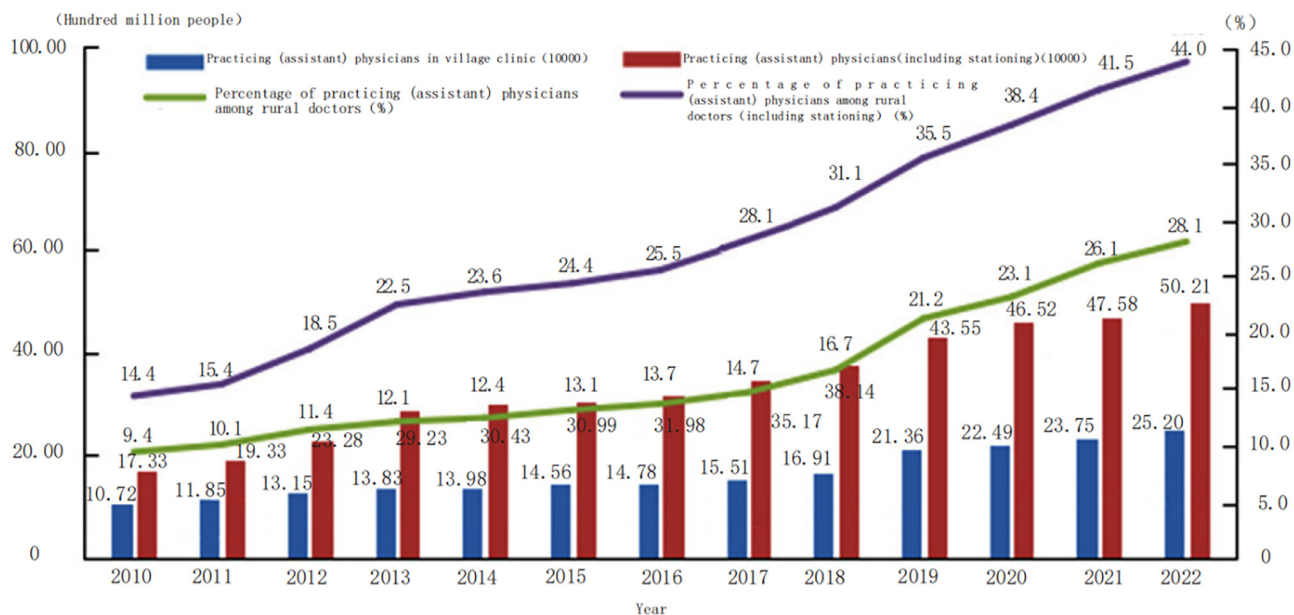


Fig. 3. The number and rate of practicing (assistant) physicians in village clinics in China from 2010 to 2022.

basic public health services and adding 17 major public health services projects. The per capita fiscal subsidy has risen from 15 Yuan (CNY) in 2009 to 84 CNY in 2022. The number of hypertension patients under management increased from 14.8 million in 2009 to 112.36 million in 2022, and the number of diabetes patients managed grew from 4.64 million to 37.92 million,⁷ marking an almost eightfold increase in the management of chronic diseases since 2009. The systematic management rate of children under three years old increased from 77.2 % in 2009 to 93.3 % in 2022, and the prenatal examination rate for pregnant women improved from 92.2 % to 97.9 %, demonstrating continuous expansion in the coverage of basic public health services.

There is a steady increase in family doctor contract coverage in China. Since 2016, China has actively promoted ‘family doctor contract services’, gradually establishing continuous, convenient, comprehensive health services that cover the entire lifecycle and encompass all essential elements. Moreover, family doctor teams, primarily based in primary care facilities, provide a range of services including home visits, long-term prescriptions, referral green channels, family bed services, and medical insurance reimbursement benefits, ensuring contracted residents receive tangible benefits. By the end of 2022, China had established 441,000 family doctor teams, an increase of 10,000 from the previous year, further enhancing the service supply capacity. The coverage rate for key populations reached 80.1 %, marking a 4.8 percentage point increase from the previous year.

Women’s and children’s health situation has continuously improved in China. A maternal and infant safety system centered on reducing maternal and infant mortality rates was implemented in China. This system includes pregnancy risk screening and assessment for expectant mothers, management of high-risk pregnancies with specific plans, enhanced treatment for critical maternal and neonatal cases, real-time reporting of maternal death cases, and regional accountability through discussions and notifications. These measures have created a comprehensive management strategy for maternal safety.⁸ Through relentless efforts, the maternal mortality rate decreased from 31.9 per 100,000 in 2009 to 15.7 per 100,000 in 2022. The infant mortality rate dropped from 13.8 ‰ in 2009 to 4.9 ‰ in 2022. These improvements position China among the top ten high-performing countries globally in maternal and child health.⁹

China ranks highly among upper-middle-income countries in key health indicators. In 2021, China’s life expectancy at birth was 78.21 years, surpassing the average for upper-middle-income countries by

3.52 years (74.69 years). The infant mortality rate was 5.1‰, significantly lower than the average of 9.6‰. Additionally, the maternal mortality rate in 2020 was 23 per 100,000, far below the average of 61 per 100,000 for upper-middle-income countries.¹⁰ These traditional health outcome indicators show that China exceeds the average levels observed in upper-middle-income countries.

GPs play a pivotal role in PHC. Throughout various stages of development in PHC, primary care staff have been assigned different roles and responsibilities, each with varying levels of competence. By the late 1990s, China began to develop its workforce of GPs, positioning the discipline as a second-level clinical subject. The functional role of GPs is to provide patient-centered, preventive, coordinated, and continuous professional medical services outside of hospitals. GPs are crucial for managing the biopsychosocial aspects of PHC.¹ They are the primary providers of basic medical and public health services, playing a key role in expanding the coverage of basic public health services, enhancing the quality of contracted services, and improving the health of women and children.

Current challenges of PHC in China

PHC is not an isolated system but rather one that evolves with societal, economic, political, and disease burden changes. This is embodied, by the heterogeneity of international experiences between countries, as well as non-replicability of practices in the history of a country. The macro context of PHC is undergoing unprecedented changes. Currently, the increased health literacy and demands among urban and rural residents, accelerated aging and declining birth rates, high prevalence of chronic diseases, and the epidemic of old and new infectious diseases are putting significant pressure on health service structural resources. These trends highlight the indispensable role of PHC in responding to public medical needs, addressing the challenges of declining fertility and deep aging, managing multiple chronic diseases, and enhancing and maintaining the quality of life. PHC plays a crucial role in the screening, detection, and management of infectious and non-communicable diseases.

The role of PHC is more evident and crucial now than ever. However, PHC system faces challenges related to the insufficient quantity and quality of structural resources, with pronounced disparities among regions, urban and rural areas, and social classes. Issues such as inadequate allocation of health insurance funds, inactive operational mech-

anisms in community health service centers/township hospital, and a lack of attractiveness in primary care positions hinder the high-quality development of PHC. These structural and operational challenges must be addressed to ensure that PHC can fully realize its pivotal role in the health system.

Imbalance in infrastructure development of the PHC system

China's approach to guiding the development of PHC by a top-down nominal required, contrasting with other countries' central management. Unlike centralized control, The Central Government of China has decentralized PHC responsibilities of investment to the local governments. The 2018 notification from the General Office of the State Council on the "Reform Plan for the Division of Governmental Financial Responsibilities and Expenditure Responsibilities in the Healthcare Sector"¹¹ clearly assigns the construction and development of primary care facilities to local jurisdictions. Due to imbalanced socio-economic development across regions, this decentralization has led to significant disparities in the investment and development of infrastructure in primary care. In rural and less developed areas, the infrastructure development is notably lagging. For instance, some township hospitals do not meet the basic standards set for "Quality Services in Primary Care," such as in terms of building area. There is a shortage of rehabilitation and integrated medical and nursing care beds, and the availability of essential medical equipment like DR machines, ultrasound machines, ventilators, and automatic biochemistry analyzers needs to be strengthened.

Decline in proportion of PHC funds, need for strengthened financing

The share of resources allocated to "higher-level" (i.e. tertiary) medical services continues to outweigh that dedicated to PHC. The proportion of medical insurance funds consumed by tertiary hospitals has been rising, while funding for primary care services has been decreasing, exacerbating the "top-heavy" phenomenon. National Health and Finance annual reports from 2012 to 2022 indicate a consistent decline in the percentage of medical insurance fund revenue at government-operated community health service centers/township hospitals, falling from 15.7 % to 12.0 %, a decrease of 3.7 percentage points. This decline results from a combination of the rapid development of public hospitals drawing resources away (a "siphoning effect"), and constraints faced in PHC, such as constraints imposed by total medical insurance fund budget targets, differential payment rates for the same diseases in different settings, and delays in incorporating services like family doctor contract services, home-based medical care, and rehabilitation nursing into the medical insurance system. Current medical insurance management strategies, primarily focused on reimbursement ratios, deductibles, and inpatient services, no longer meet the real developmental needs of primary care facilities.

Lack of driving forces in PHC operations and insufficient salary incentives

According to the Health and Financial Annual Report data from 2022, the annual salary for staff at national community health service centers and township hospitals was 96,000 CNY. This figure is lower than the 161,000 CNY for staff at public hospitals and below the national average salary for urban non-private sector employees, which was 114,000 CNY in 2022.

Several factors contribute to the lack of vitality in primary health care. For example, in some regions, community health centers and township health centers operate under a "two-line budget system," where all revenue from basic medical services must be remitted in full, while recurrent expenditures necessary for basic medical and public health services are approved and fully allocated by financial authorities.¹² This system often results in a lack of operational dynamism due to insufficiently detailed management.

Insufficiency and quality concerns of GPs in China, low attraction of general practice positions

As of 2022, China had 463,000 trained GPs, accounting for only 10.4 % of the total number of practicing (assistant) physicians, which is significantly lower than the OECD average of 23 %.¹³ Not all of these trained GPs are actively engaged in general practice services, and even those who are full-time in clinical primary care facilities. Currently, general practitioner workforce primarily consists of individuals who have transitioned from other clinical specialties in China, with only about 10 % being "5+3" trained GPs (from 2015 to 2019, approximately 45,000 residents were enrolled in general practice training programs¹⁴). Compared to international general practice training standards, China's "5+3" training predominantly occurs in general hospitals, which does not adequately prepare trainees for PHC roles in the community. The compensation for GPs is constrained by the overall salary levels in primary care facilities, which are typically lower than those for specialists with similar qualifications. The lagging development of the general practice discipline, limited or narrow career advancement paths for GPs, and the low compensation are major reasons for the low attractiveness of general practice positions.

Need for better community engagement, integration of prevention and treatment, and public participation in PHC

Incorporating health considerations into all government policies and community activities is a core principle of PHC. PHC extends beyond mere medical services; it is intricately linked with all governmental policies, all relevant community resources, and extensive public participation. There remains significant scope for better integration of PHC and the Healthy China initiative across all levels of government. Some policy contradictions, such as those between tobacco production and cancer prevention initiatives like smoking control, still need to be addressed with a health-oriented approach. Within the health system, the challenge of integrating therapeutic and preventive services, medical and public health services, and managing responses to emergencies or pandemics demands rigorous top-level design. The integration of PHC into community life and the involvement of community resources in PHC are both lacking in sufficient community capital. People are not yet ready to actively participate in PHC activities that concern both themselves and their communities.

Future strategies for high-quality development of PHC in China

China requires a more robust PHC system to provide high-quality, safe, integrated, and affordable health services, with a problem-oriented approach to define the development directions for primary health care in China.

Increase PHC investment and establish sustainable financing mechanisms

As highlighted in the Alma-Ata Declaration 45 years ago, the government has a fundamental responsibility for the health of its people. This irreplaceable responsibility for PHC first manifests in the structural quality of care. It involves consistently increasing the share of financial investments in PHC within the total health spending, fostering the development of basic medical and health human resources, enhancing the infrastructure and equipment suitability of primary care facilities, and strengthening information systems and evidence-based practices in PHC. Economically, it is essential to adjust medical insurance policies with a focus on primary care, implement global budget and surplus retention policy for medical consortiums, and boost the allocation of medical insurance funds to primary care. Efforts should also be made to adjust the pricing of primary care services, ensuring that appropriate primary care services are included in the medical insurance reimbursement list.

Comprehensive measures to continuously strengthen the capacity of primary care services

Human resources are the cornerstone of all elements within PHC. The training curriculum for PHC needs reform to enhance the performance of staffing and training for primary care personnel, with a goal of achieving minimum competency standards. It is essential to engage in continuous professional development and quality improvement programs, balancing standardization of education with individual development opportunities. Intensive efforts should be made in continuous professional development and quality improvement programs, considering both standardization of training and individual development. Utilizing urban medical consortiums, specialty alliances, and integrated county medical consortium, targeted assistance and team-based assistance should be promoted, along with establishing joint clinics, joint wards, expert studios, and personnel dispatching to push health resources to the primary care. Digitally enabling primary care services and advancing the application of medical AI in diagnostics and health follow-ups in primary care should be further explored.

Stimulate vitality in primary care, enhance the quality and efficiency of primary care services

Empower primary care facilities with management and fiscal autonomy to stimulate their initiative. Refine performance wage policies in primary care and strengthen performance management, expanding the sources of compensation for primary care facilities. Implement the “two permissions” policy, establish dedicated allowances for GPs and ensure their salaries are comparable to those of clinical physicians in local public hospitals under similar conditions, thereby increasing the attractiveness of general practice positions.

Improve service methods and quality, enhance public health satisfaction

Innovate service concepts and models to enhance the quality, individualization, precision, and accessibility of primary care services; improve the quality of primary care services. Provide comprehensive, continuous, and life-cycle-wide primary care services to all citizens, aiming to improve their satisfaction with health outcomes.

International insights on PHC in China

Focusing on the primary care to promote high-quality development of PHC

High-quality development of PHC is about providing the most equitable, accessible, safest, and cost-effective basic medical and health services to the public. Clearly, achieving high quality in PHC does not necessarily involve high-tech or expensive services. Insufficient coverage of primary care services is a global challenge, but the nature and extent of these deficiencies vary. It's estimated that the majority of essential interventions (90%) for universal health coverage could be delivered using a PHC approach, and up to 75% of the projected health gains from the Sustainable Development Goals could be achieved through PHC.¹⁵ In May 2023, the 76th World Health Assembly emphasized “orienting national health systems towards PHC as a foundation for universal health coverage, health security, and improved health outcomes”.¹⁶ Establishing a health and medical system in China that is fundamentally based on primary health care is currently a national priority.

Providing sufficient funding for PHC to promote equitable access

To meet the health goals set in 2015, countries are required to increase their spending on PHC by at least 1 % of Gross Domestic Product (GDP).¹⁷ An overreliance on hospitals to provide primary care services is a significant reason for inefficiency in many countries.¹ Allocating healthcare resources to capability improvement of primary care services

is crucial for China to achieve its goal of universal health coverage.¹⁸ With the rise of non-communicable diseases, population aging, and the emergence of new and old disease epidemics, China needs to increase investment in primary health care.

Building people-centered, community-based services

Constructing people-centered services is an effective method to reduce fragmentation in health service systems and improve the quality of medical services. In 2015, the World Health Organization advocated for the integration of medical services, suggesting that health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation, and palliative care should be merged into a seamless, lifelong healthcare model.¹⁹ In 2014, the UK restructured primary care and community services through its sustainability and transformation plans by creating integrated care communities that reduced reliance on hospital services.²⁰ Thailand enhanced PHC by establishing regional medical group and the allocation of funds to attract financial and human resources to the primary care and rural areas.²¹ In China, the integrated county medical consortium and the high-quality development of family doctor contract services are critical for future development. International insights show that element integration and labor division are concurrent strategies in service system management, both of which are indispensable. Emphasizing a people-centered approach requires balancing integration and specialization, under the premise of meeting the needs and needs, let the service system get the most possible efficiency and benefits.

Strengthening PHC workforce with a focus on GPs

The development of general practice as a human resource in health care depends on significant and deep changes within the medical education system. From the outset of undergraduate medical education, helping students to understand general practice, as well as the medical ethics, morals, and societal responsibilities, is the most valuable experience of many countries in the successful development of general practice. During the undergraduate phase, medical students should experience general practice before general hospital or specialty, ensuring substantial coursework is dedicated to general practice. After completing 2–3 years of standardized residency training to ensure that GPs have sufficient clinical experience, they should proceed to a 3–4 year community-based general practice training program. This training should occur within the community, helping trainees meet the minimum standards necessary to independently provide general practice services. Supporting GPs with ongoing professional development after their training is also essential. Many countries increase the number of positions for general practice training and encourage foreign doctors to engage in general practice to mitigate shortages. In the Netherlands, France, and Canada, over 40 % of residency training positions are allocated to GPs.¹³ The UK has shifted the focus of health care services from hospitals to the community, establishing effective training, motivation, and regulatory mechanisms for GPs, coupled with a gatekeeper mechanics, to ensure the effective delivery of PHC.

Medical schools in various countries promote team-based learning to enhance the abilities of PHC professionals to work and collaborate within community teams. While these practices may not be wholly replicable in China, they offer valuable insights for enhancing the training and quality of GPs in China, establishing incentive mechanisms for their training and employment, and expanding public health and nursing personnel to strengthen the multidisciplinary primary health care workforce.

Limitations and future research considerations

The research is based on archive literatures and statistical data from health yearbooks, with discussions enriched by the researchers' exten-

sive experience in PHC and general practice. In view of the length, the author cannot detail the development of PHC in China. Constrained by the characteristic of yearbook data, it was not possible to perform further analysis of PHC related data; Therefore, the structure and process of PHC are roughly formulated, and an in-depth analysis of their structure and process needs to be studied in future topics. Currently, the data from the yearbooks primarily reflect old-fashioned health indicators, without including metrics on disease burden, quality of life, or service experience. The authors aim to address these gaps in upcoming research, especially through data from health service studies, to provide a more comprehensive understanding of primary health care impacts.

Declarations

Not applicable.

Authors' contributions

Conceptualization, Q.J.; Writing—original draft, Q.J.; Writing—review and editing, Q.J., Z.Y. and Z.L. All authors have read and agreed to the published version of the manuscript.

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Not applicable.

Consent for publication

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Availability of data and materials

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Declaration of competing interest

The authors declare that they have no competing interests.

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