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Review

Evolution of primary care in China 1997–2009

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ABSTRACT

Primary health care, once the cornerstone of China's health system, has been neglected in the country's market-oriented system. Recent primary care reform was designed to improve access, quality and efficiency of health service use, but the results are unclear. The government is dramatically increasing funding for community health services, but there is concern about maximizing the impact of this investment. This paper draws on policy analysis, literature review, and a secondary analysis of two case studies and two surveys to review the structure of community health services and public reaction to them. Our results suggest that despite several years of primary care reform, current performance remains poor. The capacity of providers is low, services are not felt to be affordable, and patients report concerns about safety, all contributing to low utilization of community health facilities. We argue that the minimum skill set for community health service providers should be clearly defined to focus training efforts as should the role of community health facilities within the health system. Moreover, a quality and accountability framework for community health service is needed so that increased funding can produce a strong foundation for China's health system.

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1. Introduction

Primary health care is the cornerstone of any health system and yet it has been neglected in many low and middle-income countries, plagued by low health human resource capacity and underinvestment [1]. Extensive reviews of the literature have shown that strong primary

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health care improves population health, and reduces the socio-economic gradient in health [2,3]. Specific benefits of primary health care include improved access to essential services, higher quality of care, greater focus on prevention, early management of health problems, and increased appropriateness of care [2]. This is particularly important for rapidly industrializing countries like China.

China is a lower middle-income country with a GDP per capita of $6600 at purchasing power parity, a population of 1.3 billion [4], and a booming export market with over $1.5 trillion US in foreign reserves [5]. China once had a strong primary health system that was a model for other nations, but after market reforms in 1978, there was a shift in funding from rural to urban facilities and from community health service to specialized hospital based care, with a mandate for health institutions to generate a large portion of their operating revenue. This led to a proliferation of specialists, and excessive use of drugs and high-technology diagnostic tests [6]. Along with the collapse of cooperative medical insurance, these policies had a disastrous effect on access to care and utilization [6–8], given the lack of health insurance coverage, a high level of out-of-pocket payments and poor quality of care [9]. China has now been through almost 30 years of rapid growth since then, but social development has lagged behind economic development. To address widespread public dissatisfaction with the health system, the government has dramatically increased health spending. In 2006, health spending in China was 4.7% of GDP, with government spending accounting for 18.1% of the total [4]. Health spending increased by more than 50% in 2006 [10], with a planned $124 billion US dollars government investment in 2009–2011, doubling the average annual governmental expenditure compared to 2008 [11].

Current reforms aim to position community health services as the foundation and entry point for the health system, which is being supported by new policies and increased government investment. Urban and rural health systems in China are distinct and are being reformed separately, with policies generally promoting use of primary care services and improving financial protection. Much has been written about rural health reform [12,15,16], but there is little published evidence to date on the evolution and impact of community health services in urban areas from early pilots in the late 1990s until now [13]. Much of the existing literature focuses on insurance and financial protection [14], but the focus here will be on multiple dimensions of performance in primary care. This paper draws on policy documents, national statistics and secondary analyses of case studies and previously unpublished national surveys conducted by the authors for the Chinese Ministry of Health between 1999 and 2007. This paper will review the evolution of community health service in urban China in the last decade to explore the implications of increasing funding for community health services.

Establishing community health services (as primary health care services are often called in China) as the foundation of the health system requires a viable model of care, supportive policies, a network of facilities, trained primary health care professionals, financial support or insurance coverage to promote access, and public satisfaction and confidence in these services. These elements will be covered in four sections. The first section describes influential models of community health service from the beginning of primary care reform in the late 1990s. The next section details the policies regarding primary care from 2002 until now. This is followed by a description of the current structure of community health services nationally. The last part assesses the performance of primary care based on patient knowledge, utilization and satisfaction with the current community health services in China. Overall, this provides a picture of the current state of primary care in urban China and identifies areas for policy development and investment.

2. Early models of community health services in China

In 1997, the central government suggested that pilot studies of community health service delivery be conducted to explore and test new models [17]. From 1999 to 2001, China set development goals, the specifications of health facilities and the responsibilities of community health services. In this context, there was a profusion of community health service pilot projects. From 1999 to 2002, two independent evaluations of community health center pilot projects using detailed case studies were conducted. One was in Zhong Guan Cun district in the northwest of Beijing and the other in Yulin district in Chengdu, Sichuan province. This section will use the main results of this evaluation to describe early models of community health service in China in terms of access, comprehensiveness, and coordination of care [18]. Since most community health resources are based on existing staff and facilities working in hospitals, these cases describe the viability of transforming community hospitals into community health centres.

There are two categories of community health service facilities in China: community health centres (CHCs) and community health stations (CHSs), which are smaller and designed to improve geographic access, covering areas further away from CHCs. In Beijing, Zhong Guan Cun Hospital, a secondary hospital, transformed one of its wings into a CHC with three affiliated CHSs located elsewhere in the district. In Chengdu, the Yulin Maternal and Child Health hospital, a primary hospital with 10 beds, was transformed into an independent CHC. Medical and nursing staff from internal medicine and other departments were given 12 months of part-time training in family medicine and then dispatched to work in the CHC or the CHSs.

The Zhong Guan Cun CHC was registered with social health insurance and thus most services could be reimbursed, giving a high degree of financial access. The high rates of coverage were exceptional given the centre's location near a large number of state owned enterprises and government facilities. The Yulin CHC was not registered with social health insurance initially, but CHCs were welcomed by health districts, and it was registered by the end of the three-year study. As for temporal accessibility, the Zhong Guan Cun CHC was open from 8 am to 5 pm on weekdays and a half-day on weekends with 24-h access to the hospital emergency room. The Yulin CHC was open 7 days a week, 24 h a day. In both CHCs, patients were given their personal doctors pager number. Wait times were variable

in both CHCs, but all patients came as walk-ins without appointment and waited less than 30 min. Both clinics were in high density areas, with most patients within 1 km of the CHC. Both clinics also offered home care for the frail elderly, which was provided at the patient's request. There were many other clinics and hospitals in the districts where the pilot projects were situated and most people in the catchments area were not registered with the CHC, so these centres did not represent patterns of care for the entire district.

Comprehensiveness, "the provision, either directly or indirectly, of a full range of services to meet patients' health care needs" [19], is a key feature of primary care, and was a stated goal of community health services. However, these models did not require individual physicians to provide comprehensive clinical care like general practitioners in many Western countries [20]. In Zhong Guan Cun, all of the physicians were from internal medicine departments, and despite the training they received, they only felt comfortable dealing with internal medicine problems after 3 years in the CHC. Patients with pediatric, surgical and obstetric problems went directly to their respective specialty departments in the hospital. On the other hand, Yulin had a broad mix of specialties and was able to handle basic pediatric, minor surgical and obstetric issues. Physicians arranged to shadow each other within the clinic to learn more about each other's specialties and broaden their respective skill sets, creating more of a multi- and trans-disciplinary model of care. Public health services, such as health education, management of patients with chronic diseases were also provided in both CHCs. Both the Zhong Guan Cun and Yulin CHCs had signed reciprocal referral contracts with local tertiary care hospitals, however they found that in practice they referred to the hospital but did not receive information (or patients) back. However, both CHCs did establish relationships with local neighborhood committees to administer health education activities and home care in the community. In conclusion, early models of community health service delivery in China had acceptable temporal and geographical access, but comprehensiveness and coordination of services were poor. These required changes beyond the facilities involved in these pilot studies, with broader policy changes to support the development of primary care.

3. Key policies regarding community health service in China

The growing interest in the development of community health services is reflected in the increased investment and leadership of government to support the public goals of this sector. This is a gradual change from the previous market-oriented policies in health care. In 2002, the Chinese government recommended building a network of clinics, constructing and converting facilities, training professionals and registering with health insurance to facilitate the development of community health services [21]. In 2003–2005, the Ministry of Health and related government departments launched a nationwide assessment of demonstration districts of community health services. In total, 108 districts representing the whole country were selected as exemplars to be studied and imitated by other districts, and the implementation of relevant policies of community health service was further strengthened. The main problems met during this period included insufficient funding, variation in structure, low human resource capacity, poor quality, and low utilization and the recurring complaint *kan bing nan, kan bing gui* (seeing a doctor is difficult, seeing a doctor is expensive) [22].

To address these problems, the State Council of China made additional policies in July 2006. Community health services were proposed as the cornerstone of the entire health system, coordinating with hospitals and disease prevention institutes. The community health service network was to be built with existing health resources. Community health centres were to be mostly publicly funded, while community health stations could have different types of ownership. The government would subsidize the development of community health services in terms of basic construction and public health services. Community health facilities could apply to register with social health insurance, and care in community health centres would have a reduced copayment compared to hospital outpatient care. In order to increase the supply of appropriately trained community health professionals, systematic measures regarding basic medical training, in-service training, four-year GP residency training programs, and continuing medical education were proposed. Traditional Chinese medicine was proposed as a required service in community health facilities [23].

In 2007, the President and Premier of China emphasized the importance of development of community health services, signaling, for the first time, the highest level of support for this area. In 2009, China's framework for health reform positioned community health services as the first point of contact with the health system, responsible for common clinical problems and public health, and improving health equity [24]. Over this period, China developed policies regarding finance, administration, human resources, health insurance, and the price of community health services. Furthermore, a large network of community health facilities has been constructed. The number of community health facilities nationwide tripled from 2001 to 2008, and the number of community health professionals has also risen (Table 1). Chinese Health Statistics shows that the proportion of cities having community health facilities that offer services to residents has increased from 80.4% (2006) to 90.6% (2008), and that a national network has been established.

4. Current structure of community health service in China

In this section we describe the current structure of community health service in China by focusing on key inputs (facilities, human resources and finance) and outputs (scope of services) using national data [25]. In 2007, a national census of community health centres was commissioned by the Ministry of Health, providing the most comprehensive picture of community health service to date. It involved 3 questionnaires distributed to 32 provinces, autonomous regions, and municipalities directly

Table 1
Community health facilities, professionals and volume of visits (2001–2008).

	2001	2002	2003	2004	2005	2006	2007	2008
N of CHS facilities	11,700	8211	10,101	14,153	17,129	22,656	26,472	29,127
N of CHS professionals	–	–	–	78,122	95,868	131,535	149,747	185,080
Volume of visits in CHS facilities (billion)	–	–	0.074	0.097	0.122	0.177	0.226	0.257
Volume of visits in hospitals (billion)	–	–	1.213	1.305	1.387	1.471	1.638	1.782
Proportion of visits in CHS facilities (%)	–	–	6.10	7.43	8.80	12.03	13.80	14.42

Source: China Health Statistics (2001–2009).

Table 2
Average staff per community health facility.

Provider	Average staff per unit	
	Community health center	Community health station
Physician	18.1	3.5
Nurse	13.1	2.4
Public health worker	3	0.3

Source: National Census Report on Community Health Service Facilities in China (2007).

under the Central Government. The response rate in the 1255 districts where the survey was distributed was 100% for all three surveys [26]. In 2008, there were an estimated 8903 community health centres (CHCs) and 20,224 community health stations (CHSs) which were newly constructed or converted from small, street-level hospitals. The majority of community health facilities were owned by government, with only 9% of CHCs and 28% of CHSs having private ownership. Twenty-nine percent of CHCs were affiliated with hospitals, while 58% of CHSs were affiliated with CHCs. Every CHC covered a catchment area of 38,000 residents on average, which met requirements of the central government (30,000–100,000 residents per CHC) [27]. Because many community health facilities were converted from hospitals, some still had beds for observation. In total, 46% of community health facilities had beds, about nine on average, while 38% of CHSs had beds, with three on average.

Community health centres tend to be large, with an average staff size of 18.1 physicians, 13.1 nurses and three public health workers (Table 2). The smaller community health stations have an average of 3.5 physicians, 2.4 nurses and 0.3 public health workers. The ratio of doctors to nurses in community health services overall was 1:0.69, as compared to a ratio of 1:0.77 for the entire health system [28]. Thus community health services are predominantly provided by doctors. Training levels, as shown in Table 3, were generally quite low. Only 26% of physicians completed a full 5-year medical program, while 65% have 3 years of training out of high school and middle school. Nurses are overwhelmingly from the technical and junior college level, with only 2% having bachelor's degrees. Since it is a new discipline, most general practitioners (GP) are currently practicing specialists or technicians who are retrained, with more than 60% of doctors having no GP training from an in-service program because these are only available in provincial capitals [29]. Though primary care was previously provided by barefoot doctors with limited training in a few areas of health care, the model of comprehensive care by a GP is very new. In China, there were two general practice (GP) training programs which independently started in 2000 and 2001. One was a four-year GP residency training projects, and the other was a GP training-in-service program [30]. The number of programs has since grown, but they are limited by a lack of teaching of practical skills [30].

In 2007, only 57.3% of community health facilities were recognized by social health insurance, which means that in a large proportion of districts, people with social health insurance could not be reimbursed if they sought care in a CHC. The proportion of CHCs recognized by social health insurance was higher than CHSs, which was 86.6% and 48.2%, respectively. In addition to the uneven insurance coverage, China has only taken limited steps to increase use of community health services. The health insurance policies of some jurisdictions such as Baoan district in Shenzhen require patients to seek care first in CHCs before being reimbursed, but this is still a marginal phenomenon [31]. The more common practice is to have differential reimbursement rates for care in CHCs as compared to hospitals, but rates vary by insurance system and jurisdiction. The Urban Resident Basic Medical Insurance provides outpatient coverage for specific fatal or chronic conditions, with coverage for inpatient care ranging from 30% to 85%, with wealthier cities offering more than poorer regions [14]. However, outpatient coverage by the Urban Employee Basic Medical Insurance can be quite high. In Beijing the reimbursement rate is 90% in CHCs and 70% in hospital, while in Guangzhou, the rates are 90% and 80%, respectively [32,33].

Community resident committees have provided input on establishment of community health facilities, and help organize community-based activities such as health education delivered by CHCs [23]. A seamless reciprocal referral system between community health facilities and tertiary hospitals has not been established, as community health facilities refer patients to the hospital but only rarely

Table 3
Level of training of community health service staff.

Provider	Bachelor's	Technical college	Junior college	No formal education	Unclear
Physician	26%	38%	27%	4%	5%
Nurse	2%	23%	66%	5%	4%

Source: National Census Report on Community Health Service Facilities in China (2007).

receive information or patients back [34]. This is in part because of the current system of health finance, where hospitals need high volumes to cover their operating expenses and are in competition with CHCs to attract patients. However, hospitals will give some technical support such as training to CHC technicians in accordance with the existing policy [34].

Primary health care in urban China is defined as the delivery of comprehensive, continuous, and convenient episodic and preventive health care services to families in the community. PHC uses community resources to provide residents health education, family planning and rehabilitative services. The mandate of the CHCs is to keep people healthy and target women, children, seniors, and those with disabilities or chronic illness [27]. According to the latest national census of community health service, currently all community health facilities offer preventive, diagnostic and curative medical care. In addition 84% of community health facilities have personal health assessments for community residents, but their impact is limited by incomplete information, and lack of use for clinical or planning purposes [35] as they are separate from patient charts, which are held by patients rather than facilities.

Case management services for patients with chronic diseases such as hypertension or diabetes are offered by 76.6% of CHCs. Good health outcomes have been achieved through systematic case management of patients in some districts [36,37]. Other services offered by most community health facilities include health education (82%) and immunizations (77%). Chinese medicine is offered by 22% of CHC physicians and 41% of those in CHS offer traditional Chinese medicine [38]. The majority of patients (86%) reported they used Chinese medicine services after being sick, which often included medical care and preventive services using Chinese patent drugs, compound Chinese medicine, acupuncture, massage, and cupping [38].

5. Utilization, knowledge, and satisfaction with community health services

Despite its stated role as the first point of care, utilization of community health services remains low. China Health Statistics (2007) shows that the average annual volume of basic medical care of each CHC reached 40,000 visits and every physician saw 13 patients per day, with 4132 visits annually and 15 patients a day for each CHS. Although the number of visits to community health facilities has doubled in the past 5 years, this only accounted for 14.4% of all visits in 2008 (see Table 1). There are many potential reasons for low utilization, but awareness of services and public trust are likely to be key factors.

From 2004 to 2005, a public survey was conducted in 112 "model" communities across China with a total of 2240 patients, representing high performing areas according to provincial administrators [39]. This survey found that 59% of respondents were aware there were community health facilities in their communities but that only 31% of them had used one of these facilities. This survey also included questions regarding the convenience, comfort, affordability and safety of community health services. Respondents reported that services were convenient (93%) but only 42% felt they were comfortable. Just over one-quarter (28%) reported that community health services were affordable, suggesting that financial access to these services remains limited. Similarly, only 35% of patients felt that community health services were safe, underlining a very low degree of confidence in the quality of this care. Lastly, low overall satisfaction (48%) suggests that these services do not meet the expectations of current users.

6. Discussion

China has developed viable models of community health services, constructed a network of facilities, and produced a general policy framework during the period of health care reform from 1997 to 2009. Early pilot projects demonstrated that existing primary and secondary hospitals could be converted into viable community health facilities. In the last decade, the number of community health centres has grown; the proportion of facilities recognized by health insurance has increased, and the scope of services expanded. After a period of market-driven reforms, the Chinese government has also asserted public leadership and investment in community health services, but the performance of community health services needs improvement if it is to truly become the cornerstone of China's health system. Community health facilities have had limited impact on coordination and comprehensiveness of care to date. Moreover, low levels of community health service utilization, where a GP sees an average of 13 patients per day and only 14% of all visits take place in these facilities, suggests they are not yet the first point of contact with the health system. Survey data suggests the low rates of use despite perceived convenience are likely due to lack of confidence and knowledge about the provision of services by GPs as well as low satisfaction with these services.

There are at least four factors contributing to low levels of patient confidence and satisfaction with community health services. First, the capacity of community health service providers is low, with one quarter of general practice physicians and only 2% of nurses having bachelor's level training; The majority of doctors have not received in-service training in general practice. Second, public knowledge of community health service is low, with 41% of residents not knowing about the existence of community health facilities in their own communities and much less their scope of services. This is consistent with other studies demonstrating limited public awareness of community health services [40]. Third, there is a lack of evidence-based practice guidelines to support providers in offering appropriate services, particularly as they expand their scope of practice. Although the Ministry of Health has committed to develop some of these guidelines through the Community Health Association of China, there is no nationwide implementation plan or standards by which to measure or monitor the quality of community health services. Finally, current health insurance coverage does not support the use of community health services in many districts; 43% of community health facilities are still not recognized by social health insurance. The government has required health insurance related departments to take

measures to encourage the use of CHS such as higher reimbursement rates and lower deductibles, but the difference in payment is small and may still be insufficient to affect patient behavior [41]. Although some districts are reforming health insurance to encourage their use as the first contact point for care, this may be problematic if issues of public confidence and quality are not addressed first.

Universal coverage and free community health services would address the financial accessibility of these services, but acceptability would still remain an issue. If people do not feel community health services are safe or satisfactory, they may continue to bypass them for perceived higher quality specialist care, as in many other countries [42]. Thus, first contact care would not improve and the low utilization would limit the benefits of increased investment in community health services. Measures to improve utilization, such as greater differential in reimbursement between hospitals and community health facilities or requiring referrals from primary care to be seen in tertiary facilities, would need to be combined with efforts to improve quality and shift public perception.

This paper provides a snapshot that documents the most significant change in urban primary care in the world's most populous country since the late 1990s. It provides a detailed description of community health service models based on national surveys and detailed case studies. We have also reviewed the structure of community health services using the most comprehensive information collected to date. This study presents a wide range of qualitative and quantitative data, from case studies to national surveys, at different time points in the recent period of health reform. Together with descriptions of recent Chinese policy documents they give a sense of the evolution of the community health service sector and of the persistent problems in this area. The focus is on urban health care, but many of the issues raised here are common to rural areas: lack of insurance coverage for community health facilities, competition between primary and secondary care, low utilization of facilities and the absence of a gate-keeping function [12,15].

Many issues need to be addressed to make community health services, the foundation of the Chinese health system, and optimize the impact of additional funding for the system. First, the role of community health service providers should be clearly defined. Second, defining an appropriate minimum skill set and priority health issues would make it easier to establish and roll out a national training strategy. Training programs and continuing education could be focused on producing either community health service technicians, a modern version of the barefoot doctors with knowledge of evidence-based protocols for common acute and chronic conditions or the equivalent of general practitioners in western countries. It is likely that China may want to train both types of providers for different settings such as coastal versus western China, depending on the number and qualification of physicians at baseline. Another option for training community health service providers could be the implementation of a team of providers (e.g. physicians, nurses, advanced practice nurses, dieticians, pharmacists, etc.) in order to deliver comprehensive services, though the small proportion and limited number of nurses may limit this. Third, improving the utilization of services requires increased health insurance coverage for community health facilities and policies to encourage utilization of their services. This has been done to varying degrees through differential reimbursement, but bolder policies such as requiring people to be seen in community health centres first in Shenzhen resulted in significant decrease in satisfaction with services [43]. Financial incentives to encourage use of primary care should be paired with efforts to improve quality and modify patient perception, promoting community health service as a distinct and valuable form of health care. Lastly, clearly defining the goals of community health facilities and developing a framework to measure the impact of sequential reforms on the performance of community health services could facilitate strategic decision-making and use of limited (though increasing) resources. Investing in quality and accountability of community health service is urgently needed in China. Given the current investment of the government into its community health service system, there is a historic opportunity for the Chinese health system to once again become a world class model of effective primary health care.

7. Conflict of interest

None.

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