

Perspective

Community-based integration of management of non-communicable diseases in China

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Abstract

Non-communicable diseases (NCDs) are a leading cause of deaths and of disease burden in China. This paper analyzes the rationale and implications of a community-based approach to a better coordinated NCDs care and management system in China. As argued by the author, the buildup of an integrated NCDs care delivery system is feasible now and large health expenditures will be saved if more stable outpatients with NCDs could be shifted to community health facilities to receive their medications. However, the key issues remain in building a general practitioner led (GP-led) primary care delivery system in China. Some prominent issues include the shortage of quality generalists, lack of proper incentives and management mechanisms, and the absence of patients and provider, and restrictive arrangements in basic health insurance policies. Even with these hard-to-solve issues, some recent reform initiatives for integrated NCDs care delivery in some localities have demonstrated originality and creativeness in developing better coordination between primary and secondary NCDs care. However, without large-scale public sector reform, innate issues with human resource development, income distribution and financing of public healthcare providers cannot be solved. It may take a long time to see deep integration of primary and secondary NCDs care in China.

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Keywords: Non-communicable disease; Integrated managements; Coordination

Background

Non-communicable diseases (NCDs), such as cardiovascular diseases (CVDs), cancer, and chronic obstructive pulmonary diseases (COPDs) are the leading causes of death in China, accounting for 70% of disease burden and 85% of all deaths. Most of NCDs are preventable and treatable. However, they can also create serious social and economic problems without timely and effective control. Fifty-two percent of the

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NCDs burden is on the working population who are 15–64 years old. A World Bank report quotes that the economic benefit of reducing cardiovascular diseases mortality by 1% per year over a 30 year period could be equal to 68% of China's real gross domestic product (GDP) in 2010 (10.7 trillion USD).

In order to effectively control NCDs and reduce the heavy disease burden of the people, the National Health and Family Planning Commission (NHFPC, former Chinese Ministry of Health) together with 14 ministries issued the China National Plan for NCD Prevention and Treatment (2012–2015), showing a great commitment of the Chinese national government in curbing the rapid increase in the prevalence of NCDs. As pointed out in the national plan, lack of sound care networks is one of the key challenges for NCDs prevention and treatment. Since then, pilot programs in different localities have been set up to experiment with sound NCDs care networks.

Building integrated care delivery systems have been stressed as a key health reform strategy in the government report of the 18th National Congress of the Communist Party of China. This paper studied the feasibility and economic implication of an integrated approach to NCDs management in China. It also analyzed issues and challenges of transplanting the gate-keeping function of general practitioners (GPs) in the Chinese context. General approaches of current piloting efforts on community-based integration of NCDs management were discussed. And based on this, the paper pointed out the main tasks for developing an integrated NCDs management system in the short- and long-run.

Integrated NCDs management and its implication to China

A conceptual framework for integrated NCDs management in China

Integrated care — also known as coordinated care, integrated health service delivery, comprehensive care, or managed care — is a trend in health care reforms in many health systems, as a response to the fragmentation of care delivery. As defined by the WHO,¹ “Integrated care is a concept bringing together inputs, delivery, management and organization of services related to diagnosis, treatment, care, rehabilitation and health promotion. Integration is a means to improve services in relation to access, quality, user satisfaction and efficiency”.

The integrated care literature centers on different ways and degrees of cooperation between health facilities at various levels, from coordination to integration.

Distinction is also made between horizontal integration between similar levels of care or multi-professional teams and vertical integration between different levels of care, such as primary, secondary and tertiary care.^{2–9}

The concept of continuity of care is closely related to integrated care, which looks at providing care from the patient's perspective. To insure continuity of care, three key things need to be put in place; namely, the continuity of health information, a continuity across the secondary–primary care interface or well-managed discharge planning from specialist to generalist care, and provider continuity, that is to see the same medical professional each time with a trusting relationship.

According to the international experience, integrated care is usually taken as a cost-effective way to provide services to the elderly and NCDs patients, as those patients often are in special need of continuous care. What's more, integrated care implies a system-think and also means integration between the health care system and the social care system. This is particularly important for NCDs management, for these diseases have significant social determinants of health and require cooperation between multiple sectors, including the health sector.

In most of Organization for Economic Cooperation and Development countries, the general practitioners' gate-keeping functions are in place. A gate-keeping arrangement can help to increase first contact at community-level health facilities, reduce inpatient visits, and control the free movement of patients within the health service delivery system. General practitioners (GPs) are usually self-employed medical professionals, who are contracted to serve 1500–2500 people in a certain community. Different health systems have given different roles to GPs, but the responsibilities of managing NCD patients and keeping them from hospital care are mainly with primary health providers.

Community-based NCDs management has been proven to be cost-effective and promoted in many countries, including China. Data shows that total health expenditures (THE) in those European countries with gate-keeping arrangements are lower than those without such arrangements (THE as the average percentage of GDP of 7.8% versus 8.6%). Hospital-centered care delivery is no longer favored in increasingly resource-constrained health systems.

China, with an aging and urbanized population, finds it even harder to keep up with soaring demands, with health service delivery that heavily rely on secondary care. At the moment, tertiary hospitals are the main providers for healthcare services in the country (28% of inpatient care and 17% of outpatient care in

2013).¹⁰ Based on a survey by the Health Bureau of Xiamen City, 80% of common outpatients of tertiary hospitals are patients with NCDs, most of whom are stable on medications. This means these patients need to visit tertiary hospitals every one or two weeks to get regular tests and medicines, making these hospitals busy and hectic.

However, due to a shortage of human capital and other resources, community health facilities in China have a poor capacity of providing preventive care to high-risk populations. In China, community health facilities include community health centers (stations) in urban areas, and township health centers and village clinics in rural areas. People are reluctant to seek care in community health facilities. What's more, coordination between secondary and primary care has long been a problem because of the segmentation of the information system and the nonexistence of an effective gate-keeping arrangement under basic health insurance programs such as the Basic Medical Insurance for Urban Employees (BMI), Social Medical Insurance for Urban Residents (SMI), or the New Rural Cooperative Medical Scheme (NRCMS).

Since 2009, the Chinese government has launched reforms in various fields to make healthcare services more accessible and affordable to all citizens. The abnormal resource allocation and hospital-centered healthcare service delivery system have been identified as root causes of inaccessibility and unaffordability of healthcare services. Since early 2014, the central health authority has tried to reform the healthcare delivery system, so that primary healthcare can play a big role in protecting and maintaining community health and an interface between primary and secondary care can be built up for providing timely, appropriate, and continuous care for patients. In such a complex situation, an integrated NCDs care and patient management system led by community health facilities is singled out by many as a hopeful starting point for moving towards a well-coordinated healthcare delivery system.

Community-based integration of NCDs management in China

In China, a three-tier health delivery system featuring a gate-keeping role of primary healthcare and coordination between secondary and primary care did exist from the 1950s to the 1970s. 'Barefoot doctors' used to be an important taskforce for primary healthcare in rural areas. With the rise of a health market in the early 1980s, public health facilities have become

profit-driven market competitors enjoying great autonomy. Basic health insurance programs loosened restrictions on providers in 2009, which had given more freedom to patients while further fueling medical consumerism.

Community-centered NCDs management projects were first initiated in China in the 1970s. Beijing, Tianjin, and Shanghai were among the first group of pioneers. There are mainly three kinds of approaches that have emerged from these projects, namely self-management of NCDs patients, contract-based care delivery by GPs, and intervention for risk factors. These previous pilot programs accumulated experience and taught lessons.

Since the launch of the new round of health system reforms in 2009, community-based NCDs management has received increasing attention from the government. Notably, contract-based care delivery by GPs in particular is identified as an effective approach by the central health authority after careful study of the international experience. Pilot programs in Beijing, Shanghai, Hangzhou, and Qingdao have been initiated to experiment with innovative measures. What's more, coordination between tertiary or secondary hospitals with community-level health providers has been encouraged by health administrations at many localities, especially where secondary care resources are bountiful; for example, the eastern coastline cities Hangzhou and Xiamen.

To set up integrated NCDs management systems is part of the national pilot plan on integrated healthcare delivery in the country. The NHFPC have selected pilots to launch community-based NCDs management to explore integrated health service delivery. This is a sound decision.

From provider, patient, and payer's perspective, integrated NCDs management is regarded as a plan with great feasibility for the following reasons. Firstly, after years' of implementation of equalization of public health programs and other capacity building programs under the 12th Five Year Plan for Health Development, most community health facilities have the capacity to meet basic health needs of patients with major NCDs such as hypertension and diabetes. Secondly, big hospitals, especially tertiary hospitals in China are busy serving acute patients, and have scant interest in retaining such NCD patients whose diseases are at a stable stage; therefore they are willing to give up such patients. Thirdly, most patients with NCDs are elderly people in a fragile state with certain difficulties walking and they are willing to get the needed medications in a community center rather than lining up in a

busy tertiary hospital for hours. Fourthly, basic health insurance programs such as BMI and SMI have raised the attention that the management of NCDs entails soaring expenditures for such patients. Qingdao and Jining City in Shandong Province have launched pilot programs on NCD patient management. Referral arrangements are set up between hospitals and community health centers so that more NCD patients with stable disease can be retained and managed at the community-level to relieve the financial burden on health insurance schemes.

From the perspective of public finance, a community-based NCDs management system can contribute to better system efficiency and bigger savings for patients, basic health insurance programs, and the whole of society. Taking a tertiary teaching hospital in Beijing for example, if 20% or 50% of its current outpatient service volume is shifted to community health facilities, big savings would appear in the total health expenditure as well as social health insurance scheme, as [Tables 1 and 2](#) show. The reduction of outpatient visits may lead to a decrease of the number of doctors needed in the hospital, which means that more doctors could be available for working at community health centers. Moreover, there might be a spillover effect on inpatient services as well, with more minor illness shifted to secondary hospitals due to the reduction of the number of doctors. Given this is just one big tertiary hospital out of 1787 tertiary hospitals in the country, billions of saving might be obtained if serious efforts were made to prevent NCDs patients from visiting these hospitals' outpatient departments.

Table 1
Scenario one: 20% of outpatient visits shifted to community facilities.

| Items | Current | Counterfactual |
|---|---------|----------------|
| No. of bed | 1745 | 1478 |
| No. of doctors | 850 | 720 |
| No. of doctors serving outpatients | 650 | 520 |
| No. of outpatient visits per doctor per day | 15.8 | 15.8 |
| Annual outpatient visits (million) | 4.05 | 3.25 |
| Common outpatient visits (million) | 3.75 | 3 |
| Annually discharged inpatients (10,000) | 8.6 | 8.6 |
| Per outpatient cost ^a (Yuan) | 256.7 | 170 |
| Total outpatient costs saved (million Yuan) | | 63.75 |
| Potential saving of SMI ^b (million Yuan) | | 31.825 |

^a 256.7 and 170 Yuan are average cost per outpatient visit in tertiary hospitals and community health centers in 2013 (data source: Statistical Communiqué of Health and Family Planning in China).

^b SMI reimbursement rate is 50%; SMI: Social medical insurance for urban.

Table 2
Scenario two: 50% of outpatient visits shifted to community facilities.

| Items | Current | Counterfactual |
|---|---------|----------------|
| No. of bed | 1745 | 1078 |
| No. of doctors | 850 | 525 |
| No. of doctors serving outpatients | 650 | 325 |
| Annual outpatient visits (million) | 4.05 | 2.175 |
| Common outpatient visits (million) | 3.75 | 1.875 |
| Annually discharged inpatients (10,000) | 8.6 | 8.6 |
| Per outpatient cost (Yuan) ^a | 256.7 | 170 |
| Total outpatient costs saved (million Yuan) | | 162.5 |
| Potential saving of SMI ^b (million Yuan) | | 81.25 |

^a 256.7 and 170 Yuan are average cost per outpatient visit in tertiary hospitals and community health centers in 2013 (data source: Statistical Communiqué of Health and Family Planning in China).

^b SMI reimbursement rate is 50%; SMI: Social medical insurance for urban.

Such big shift in outpatient as well as inpatient flow not only has significant impact on health resource allocation, but it will also enhance the system-wide care delivery efficiency. Tertiary hospitals in China have seen rapid expansion in scale in recent years. The NHFPC just issued policy on controlling the scale of the healthcare delivery system, putting restrictions on the scale of the service system. Tertiary hospitals can no longer expand to cater to all kinds of health needs, but have to be selective in what they should provide. If stable NCDs patients on medications can be maintained by community health centers, more specialist manpower will be released and better cost-effective NCDs management achieved.

Issues and challenges for integrated NCDs management in China

In most Organization for Economic Cooperation and Development countries, a strong primary care delivery system relying on GPs have been set up. Most NCDs patients are cared for and maintained at the community-level and referred to hospitals only after they have acute onset of these diseases. Most countries use contract-based arrangements offered by health insurance programs as a way to restrict patients' free movement as well as primary care providers' referrals. Infringement of such arrangements will incur punishment or sanctions by health insurance programs. For instance in the UK, a champion country for a GPs-led primary care system, the National Health Service (NHS) requires all its beneficiaries to enroll with GPs and they can get access to specialist care in hospitals only if they obtain a referral from their GPs. As a result, the NHS spends 10% of its annual budget on

purchasing primary care, which helps it to take care of 90% of patients.

Although GPs-led primary care delivery and contract-based arrangement have been experimented with in some localities in China, some key issues are identified as the main barriers to introduction of such international ideas.

Firstly, lack of a quality taskforce of GPs is a main issue for introducing the idea of community-based management of NCDs, and there is slim hope to solve this issue in a short period of time. By the end of 2013, altogether 23,000 GPs with certificates have been produced; it is a far cry from the final target of 150,000 in the 12th Five Year Plan for Health. In urban areas, the gap between the existing GP manpower and expected target by 2015 was big 1.07 GP per 10,000 as compared to 2, while in rural areas there were only 38.2% of towns with at least one GP.¹¹ Most of the professional staff working in community centers is sub-quality, and they cannot shoulder the responsibilities of GPs. In light of the international experience with GP training and education programs, it will take at least 10 years to produce quality GPs. The huge gap of GP manpower will remain until the end of the 13th Five Year Plan period.

Secondly, proper incentives and restrictions are unavailable for managing primary care delivery. By the end of 2013, 54.87% of community health centers (stations) and 98.86% of township health centers are publicly-owned. These public primary care providers have been managed and operated in accordance with strict regulations and rules, like public institutions. Rigid internal management, lack of incentives and sound performance-management mechanisms have caused low morale and poor efficiency of staff, and has even led to a brain drain. Discouraged by abnormally low pay of medical services and the high risks associated with medical care delivery, primary care staff tend to refer patients to higher level care providers if there are any. This phenomenon is worsened by the fact that the heavy workload of public health services that are put on primary care providers and the strict assessment of public health performance forces them to invest more efforts on preventive care and other types of public health service. Community-level facilities, especially those in rural areas, often fail to attract and retain young doctors due to poor working and living conditions, low salary, and limited opportunities for promotion.

Thirdly, many urban patients tend to choose big tertiary hospitals as care providers due to lack of arrangements by basic health insurance programs.

Although basic health insurance schemes (mainly the NRCMS) in many provinces have tried to encouraging patients to use lower level care providers, the 10%–20% difference in reimbursement may not be able to provide strong enough incentives for many patients, especially urban ones. A survey shows that only 45% of urban residents chose community health centers as the first contact point when they were ill. As compared to rural residents, 70% would visit village and township health facilities when ill, urban residents have more disposable income and a stronger consumerist spirit; therefore, they often pass by primary care facilities to seek quality specialist care.

Recent pilots on integrated NCDs management and innovative approaches

The key to integrated care delivery is to have a strong primary care delivery system that can act as the frontline of all healthcare services—having first contact with patients as well as providing appropriate referrals needed by patients. Since 2006, many localities in China have launched different pilot programs on integrated NCDs management, and some general patterns of the pilots can be summarized as follows.¹²

The most commonly practiced model is to develop a GPs taskforce and encourage contract-based care delivery targeted to households. Fangzhuang Community Health Center in Beijing and several city districts in Shanghai have deeply engaged in such pilot programs. The pilots treated NCDs patients and elderly patients as primary targets. Contract-based arrangements are set up between care providers and recipients and overseen by the local health authority. In such pilots, intensified capacity building activities and infrastructure upgrading of community health centers have been greatly emphasized. Multiple ways of engaging with specialists have been tried, including setting up a one-on-one relationship between specialists and generalists. Patients have been retained due to trust-based relationship with GPs. Modern technologies, including information technology and cable TV services, were employed to improve information continuity. At this moment, 95% of communities in Shanghai have implemented contract-based care delivery by GPs, and 42% of permanent residents in the city have signed contracts with nearly 4000 GPs. The first contact and referral services are provided with help from the health administration. Key issues with such experiments include: 1) defined engagement of tertiary hospitals and their specialists (GPs are free to choose specialists

they feel akin to), 2) questionable financial sustainability of contracted services (either health insurance programs or public health budget needs to cover these services), 3) lack of technical tools for differentiating patients in need of referral, 4) quality control of contracted services.

The second type of efforts can be generally put as vertical integration of NCDs care promoted by merging of care facilities at different levels. Mostly prompted by health administrations at localities rich of tertiary health resources, big tertiary hospitals in urban areas have entered into partnership with secondary or primary hospitals, as well as community health centers to build up a regional health service delivery group or network; while county hospitals in rural areas have partnered with township health centers to form such associations. In Zhejiang Province, a partnership between tertiary public hospitals and county public hospitals has been developed to build a new health facility based on the county hospital with the assistance of and funding support from the provincial, municipal, and county governments. In such initiatives, specialists are often dispatched by lead tertiary hospitals to lower level facilities to build up their immediate capacity, and lab test resources and other equipment are pooled and shared between facilities. Telemedicine techniques have been widely used in such programs to share test results or improve the quality of care by involving specialists in consultation. In Zhenjiang City of Jiangsu Province, the Zhenjiang People's Hospital is leading such a medical group with over a dozen member facilities including several community health centers. In order to shift post-acute inpatient care to community settings, the hospital built up joint rehabilitation wards in one community health center. For such pilot programs, how to truly integrate autonomous health facilities which are owned and managed by governments at different levels is the biggest issue. Restricted by innate institutional arrangements such as rigid staff registration systems and obsolete income distribution mechanisms of public institutions in the country, those public healthcare providers cannot fully integrate with each other, not to say there is also lack of overarching health payment mechanisms.

The third type of efforts is project-based trial on clinical integration of specialist and generalist care for NCDs. Xiamen and Hangzhou have tried building up groups composed of generalists, specialists and nurses or "health managers" (specific contact points for NCDs patients who also look after training, health education, and mentoring programs). This model is coined "1+1+1". In Xiamen City, a tertiary hospital is

delivering the pilot project in partnership with two community health centers. Due to pre-existing close links between the hospital and community centers, a clinical integration program on hypertension and diabetes management has been successfully launched. Multiple measures and mechanisms were taken to provide a system solution for keeping a quality NCDs management system running. One group of measures were targeted at encouraging tertiary hospitals to give up these non-acute NCDs patients, including implementing a zero drug markup policy, abolishing earmarked subsidies for outpatient care in tertiary hospitals, and setting up performance assessment targets for clinical integration with community centers. Patients were given incentives to seek care in community health facilities, including getting public subsidies, claiming higher reimbursements, and making direct appointments with specialist through online platforms shared by the community health center and hospital. There were also measures for strengthening community health centers. A series of well-developed and well-coordinated policies have demonstrated active involvement of multiple government agencies such as a finance bureau, social insurance bureau, pricing bureau, and health bureau. Hangzhou and Xiamen cases showed that information technology has played a vital role in facilitating health information sharing and care coordination. At the moment of writing this paper, Xiamen is planning to introduce an evidence-based clinical pathway to better gauge the quality and appropriateness of NCDs care in clinical integration.

The fourth type of approach has been initiated by basic health insurance programs mainly for the purpose of containing costs. Resource constrained areas in the Western regions, such as Qinghai, Gansu, and Ningxia, have explored this approach. The main measures taken included strict gate-keeping and referral arrangements defined by the public payers in their policies. In Qinghai and Gansu, strict province-wide gate-keeping and two-way referral policies have been launched by basic health programs. After nearly a years' implementation, Qinghai has further revised its policy and come up with more amendments and add-ons to the original design, to make it more acceptable for patients and doctors. Ningxia launched pilot projects in two counties. The NRCMS contracted inpatient care with two county hospitals, and outpatient care with township health centers and village clinics. By using mixed methods (a global budget for a single hospital plus flat-rate case payment) and imposing strict quality control measures with the help of health management experts, the County NRCMS Agency pushed the county

hospitals to control costs and improve efficiency. By using capitation payment and giving incentives for township health centers to cooperate with village doctors to maintain patients in village clinics, the NRCMS succeeded in shifting outpatient visits from the county hospital to the township and village levels. In 2013, township and village level health facilities received 83.6% of outpatient visits in the whole county.⁷ Such cases show that health insurance programs need to improve their management skills, so as to design fine-tuned policies and arrangements for restricting both providers' and patients' behavior. Besides incentives and quality insurance mechanisms, punishment measures for both health providers and patients are necessary to keep the design working.

The four types of efforts summarized here indicate that different localities have seriously explored innovative mechanisms and measures for overcoming prior-mentioned issues and the challenges of introducing GPs-led integrated NCDs management in the rapidly changing local contexts in China. Although it might be too early to make definitive judgments on pros and cons of these approaches, we are proud to claim originality and innovativeness in these approaches. A well-developed and functioning primary care delivery system led by GPs may be far in the future, but it is possible to launch well-coordinated NCDs management programs based on the experience and lessons arising from previous efforts.

For one thing, the integrated NCDs management model experimented with by Xiamen City will raise attention among all stakeholders. It used a comprehensive approach to design a well-coordinated policy framework, to empower community health centers, discourage big hospitals from taking more stable NCDs patients, and steer patients to see their GPs first. Instead of using restrictive or punitive measures, the pilot program in Xiamen applied soft-handed measures and incentives to gradually change the situation. This is obviously a smart tactic, for it will take a long time for people's mindset and behavior to change. After enjoying many years of freedom, the Chinese patients, especially urban patients, will be annoyed by the fact that they have to see doctors with dubious qualifications in community health centers. However, use of advanced information technology has greatly contributed to smooth case management and good coordination between specialist and generalist care. This has demonstrated the superiority of the Chinese approach in improving information continuity—even UK does not link hospital information systems with that of GPs.

As shown by the Qinghai and Ningxia cases, health insurance policy and payment methods can be used as powerful tools in managing providers and patients' behavior. However, we may have a long way to go to have well managed care set up by basic health insurance schemes, for payment methods, quality assurance methods, and total quality management theory are just at an early stage of development.

Finally, deep integration of care may not happen if public sector reforms are not duly initiated to open up space for full integration of funding, resources, organizational structure, service delivery, and performance assessment of different care providers at various levels. Old rules and regulations guarding personnel management, institutional arrangements, income distribution, and performance assessment shall be thoroughly reviewed and tested for their suitability. Reforms of integrated NCDs management will be successfully delivered only when all these shackles on public health providers are broken loose.

Conclusions

Community-based NCDs management is regarded by the NHFPC as the first step for developing an integrated care delivery system. Analysis shows that such initiatives are feasible and may have great potential for improving health resource allocation and system-wide efficiency. However, key issues such as the severe shortage of quality GPs, lack of sound incentives and management measures, and lack of arrangements of basic health insurance programs may require further attention of health decision makers and reformers if a GPs-led primary care delivery system is expected to set up as the carrier of integrated NCDs management. Current practices and pilot efforts show originality and innovativeness of the Chinese ways of developing the integrated NCDs management system. Although further efforts may be required before any serious judgment on the success and failure of various local pilot programs, we will be confident when choosing community-based integration of NCDs management as a starting point.

This paper is mainly based on the author's previous investigations on various local pilot programs of integrated healthcare delivery, which were conducted under a study commissioned by the NHFPC and completed between August and October 2014. Data and information about different cases were mainly collected through interviews with local implementers of the programs (such as health decision makers in various local government agencies, and managers and

staff of the pilot hospital and community health centers) and through questionnaires. If possible, follow-up on these cases may be proper to capture the current situation. Views aired in the paper are all personnel views of the author, which cannot be taken as official opinions of the NHFPC.

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