

## HEALTH SERVICE DELIVERY IN CHINA: A LITERATURE REVIEW

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### SUMMARY

We report the results of a review of the Chinese- and English-language literatures on service delivery in China, asking how well China's health-care providers perform and what determines their performance. Although data and methodological limitations suggest caution in drawing conclusions, a critical reading of the available evidence suggests that current health service delivery in China leaves room for improvement, in terms of quality, responsiveness to patients, efficiency, cost escalation, and equity. The literature suggests that these problems will not be solved by simply shifting ownership to the private sector or by simply encouraging providers – public and private – to compete with one another for individual patients. By contrast, substantial improvements could be (and in some places have already been) made by changing the way providers are paid – shifting away from fee-for-service and the distorted price schedule. Other elements of 'active purchasing' by insurers could further improve outcomes. Rigorous evaluations, based on richer micro-level data, could considerably strengthen the evidence base for service delivery policy in China. Copyright © 2007 by the International Bank for Reconstruction and Development/The World Bank, 1818 H Street, NW, Washington, DC 20433, U.S.A. Published by John Wiley & Sons, Ltd.

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### INTRODUCTION

Since 1980, when market-oriented reforms began in earnest, China has made spectacular progress in improving living standards and lifting millions out of poverty (Ravallion and Chen, 2007). By contrast, its health system, which was once revered by health specialists worldwide, has found itself increasingly the subject of negative comments both in China and abroad. One persistent set of criticisms concerns the delivery system, which has been argued to be inefficient, prone to the provision of unnecessary care, of poor quality, overly focussed on drugs and high-tech care, and insufficiently focused on public health. However, while there is broad agreement that the system needs reform, there is less agreement on the causes of the system's failure and the reforms necessary to improve it. Some suggest that the solution is to encourage greater competition in the sector, including between private and public providers. Some urge rapid expansion of the private sector; others argue for a much firmer control by the government of public facilities that are seen as already *de facto* private. Some argue that competition and ownership are far less important issues than the way providers are paid, and urge moves away from fee-for-service (FFS) and reforms to China's highly distorted price schedule.

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This review seeks to contribute to the international understanding of China's health sector and to the evidence base for health policy reforms in China by summarizing and critically assessing the Chinese- and English-language literatures on China's health-care delivery system. The first section briefly overviews the institutional and policy context in urban and rural areas. The next summarizes studies on the overall quality and efficiency of China's health-care providers, touching also on affordability and access. The subsequent three sections review the literature on three of four key determinants of provider performance: payment incentives, ownership, and organization and regulation (including licensing and accreditation). The literature on one key determinant – competition – is not reviewed, because, despite the passions that the subject arouses in China, there is actually no rigorous empirical literature on the subject there.<sup>1</sup> We conclude by drawing out the implications for policy and offer some thoughts for directions for future research.

Before we start, a few words are in order on methods. The methods used in studies of health service delivery in China have improved considerably over time, and researchers have studied an ever-increasing range of providers and determinants of performance. Nevertheless, data and methodological limitations remain. As for many developing and transitional economies, the literature on China's health sector falls short of providing a strong evidence base because most studies suffer from one or more of the following weaknesses: (i) a tendency to base conclusions on changes in aggregate data over time, or before and after a policy change, without relevant comparison groups; (ii) a focus on a small sample of providers or geographic areas, so that it is unclear whether the findings are generalizable; (iii) inadequate control for differences in case or severity mix; (iv) a focus on only one aspect of provider performance (e.g. studies identifying efficient providers usually fail to use sophisticated quality measures); and (v) a lack of instruments or other approaches to address endogeneity of reforms.

Conclusions for policymaking must therefore be drawn cautiously. In our review we note instances where methods seem stronger than the norm. Studies with the weakest research designs are omitted or cited only as descriptive of the reforms, without relying on their (suspect) estimates of impact. By describing the breadth of China's reforms, including the rich tapestry of local quasi-experiments and their policy significance, we hope to stimulate investment in more detailed data sets and systematic evaluations.

## INSTITUTIONAL AND POLICY CONTEXT

Since the founding of the People's Republic of China in 1949, service delivery has been organized around a three-tier public provision system. In urban areas, the three-tier network was composed of street clinics, district hospitals, and city hospitals; in rural areas it consisted of village clinics, township health centers (THCs), and county hospitals. Provincial and central hospitals provided high-level referral care. The Ministry of Health or local Bureau of Health managed the majority of these provider organizations, but enterprises, the army, and other sectors have also been involved in delivery, and related services are supplied by maternal and child health centers and family planning centers at the county and township levels.

Prices were set by the government, and set at a low level – especially for basic services – with the aim of ensuring that virtually all Chinese had access to care. Providers received direct budgetary support to cover the difference between costs and revenues earned from these nominal fees. Preventive and other

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<sup>1</sup> China's government has recently called for increased reliance on 'market mechanisms' in the health sector (Central Committee of CPC, 2002). Unfortunately, very few studies attempt to isolate the impact of competition on Chinese provider performance. Some local media reports allege that competition has lowered prices for specific services, but no peer-reviewed studies quantify this impact, taking account of the many other features of system incentives that might be confounding factors. Moreover, there is no evidence about the impact of competition on other aspects of performance, such as quality or equity (risk selection).

public health services were financed by government and provided by anti-epidemic stations at province, prefecture, and county/district levels, as well as by THCs and village clinics.

The basic features of this system remain even today. Yet, the economic and administrative reforms that have been implemented since the early 1980s have had a profound impact on service delivery. Decollectivization of agriculture and the breakdown of the 'iron rice bowl' for urban formal sector employees both contributed to a precipitous decline in effective health insurance coverage. The referral system has broken down, with patients self-referring to any providers they can afford. Since the early 1980s, providers gained increasing autonomy to generate, retain, and manage surpluses, while government subsidies to providers accounted for a small and decreasing share of provider financing – now ranging from just over 10% in the case of THCs to less than 5% for county hospitals (Ministry of Health, 2004b). To make up the revenue shortfall from low prices for basic services, regulated prices were set at a higher rate for technology-intensive procedures and diagnostic tests, and a margin was added to drug sales (15% for Western medicine and 25% for Chinese medicine). The distortion of administered prices away from costs, which had little impact on incentives when government subsidies filled the financing gap, now gives providers strong incentives to favor the profitable high-tech diagnostics and skimp on unprofitable basic services.

The vast majority of Chinese patients continue to receive treatment in government-owned facilities, but the private sector has grown more rapidly than the public since the mid-1990s, especially in rural areas, since many village clinics have been sold to or taken over by individuals. The government has called for a mixed delivery system, albeit with at least one government-owned THC in each area (Central Committee of CPC and State Council, 1997; Central Committee of CPC, 2002). A hospital classification scheme, accompanied by policies on government subsidies, taxation, and price-setting, has been introduced, whereby hospitals are classified as either for-profit or nonprofit, with a distinction between government owned nonprofits and non-government nonprofits (State Council, 2000a,b). Meanwhile, experiments with privatization have been widespread.

Rapid cost increases, combined with decreased organized financing, have reduced the affordability of care for many. According to National Health Surveys, between 1998 and 2003, the proportion of people ill in the last two weeks who did not seek care for financial reasons increased in both urban and rural areas (Ministry of Health, 2004c).

The government has responded with a series of policy initiatives. Financing in urban areas now features municipal-level risk pooling for employees, known as basic medical insurance (BMI). When this urban system was introduced in the 1990s, the government established a national model of individual medical savings accounts combined with a social risk-pooling fund, but did not prescribe a particular form of provider payment. FFS remains most common. In rural areas, a new cooperative medical scheme (NCMS), combining household contributions with central and local government subsidies, has been piloted since 2003 and is scheduled to be rolled out nationwide by 2008. Other policy reforms – ranging from licensing requirements to experiments with vertical integration – have unfolded since the 1990s and are discussed along with the evidence of their impact in each of the sections that follow.

## PROVIDER PERFORMANCE IN CHINA'S HEALTH SECTOR

This section summarizes general evaluations of health care in China, including several indications of provider performance.

### Quality

It is widely accepted that, however measured, the quality of care in China could be improved. Drugs and equipment are widely available: for example, China has more MRI scanners per million people than

Thailand and Mexico, which are considerably more affluent.<sup>2</sup> By contrast, qualified staff is in short supply, especially at lower-level facilities. A large-scale study of 46 counties and 781 village doctors in 9 western provinces conducted in 2001 found that 70% of village doctors had no more than a high school education and had received an average of only 20 months of medical training (Wang *et al.*, 2003).

Evidence of poor quality is also apparent from studies that compare the activities of health-care providers to best-practice standards. These point to extensive over-provision of care, especially drugs. In 1998–1999, a study conducted in 4 THCs and 8 village clinics in Wuxi County of Chongqing and Min County of Gansu concluded that less than 2% of drug prescriptions were ‘rational’ (Zhang *et al.*, 2003). In the case of village clinics, only 0.06% of drug prescriptions were deemed reasonable. Evidence of over-use of surgery is also evident. For example, Caesarean sections have increased in China faster than can be explained by increases in risk factors (Cai *et al.*, 1998). There is some evidence that health-care quality in China has improved over time, but these improvements seem to be confined primarily to urban areas and certain dimensions of quality (Zhuang and Tang, 2001).

Beneficiary perceptions also point to weaknesses in the quality of health care in China, but mostly the complaints are about the information that patients receive. In a recent sample interview with 642 urban residents, roughly 70% expressed satisfaction with health-care services, and 65% were satisfied with the attitudes of the health providers (Cai *et al.*, 2002). However, 54% complained that their doctors were not clear about their disease status, and 4% said that they or their relatives had open conflict with the health providers (*yiliao jiu fen*).

### Costs and efficiency

A variety of indicators suggest low levels of efficiency in China’s health sector. Bed occupancy rates are low: the average for all hospitals in China is just over 60%; in THCs, the figure is below 40%. In the established market economies of the Organisation for Economic Cooperation and Development (OECD), the average is nearly 80%.<sup>3</sup> The productivity of health staff is also low, with relatively few patients seen per day (about 5 outpatients per doctor and 1.5 inpatient beddays per doctor for general-acute hospitals in 2004) (Ministry of Health, 2005a). Low-capacity utilization raises costs above the feasible minimum, although how far is not known and so does the provision of unnecessary care: one study found that 20% of all expenditure associated with appendicitis and pneumonia treatment was clinically unnecessary (Liu and Mills, 1999). In part this was because of excessive drug spending (one-third of drug expenditures were considered to be unnecessary by a panel of reviewing physicians), but it was also due to overly long hospital stays (the panel concluded that, for both conditions, length of stay could be reduced by 10–15% without any adverse effects on health outcomes).

Levels of productivity also appear to be stagnating or falling. Since the 1980s, the number of providers has increased while caseload has been falling (Ministry of Health, 2004a). Bed-occupancy rates were, as a result, falling, especially in THCs, at least until 2000, with slight improvements since then (Ministry of Health, 2005a). The number of patients treated per provider per day has also fallen in rural areas.

### Affordability, disparities and access

These changes partly explain the rapid inflation in China’s health sector: health spending has risen much faster than per capita income and prices generally, with nominal per capita health spending increasing more than 8-fold in urban areas and almost 7-fold in rural areas between 1990 and 2002. Health spending as a percentage of GDP increased from 3.17% in 1980 to 5.65% in 2003 (Ministry of Health,

<sup>2</sup>Data on MRI scanners per million are available in China’s health statistical digest. Data for Mexico and Thailand are available in the OECD Health database and Hutubessy *et al.*, 2002, respectively.

<sup>3</sup>Data for OECD countries are from the OECD Health database. Data for China are from China’s health statistical digest.

2005a). These increases in health spending undoubtedly reflect rising incomes and a more complex caseload – less infectious diseases and more chronic diseases, for example. Spending increases also reflect to a large degree the rapid adoption of new technology (Liu and Hsiao, 1995). Whether the rise in costs and the adoption of new technology has been too fast are, of course, hard to say. But what *is* clear is that rapidly rising health-care costs and limited insurance coverage have made health care increasingly unaffordable for China's poor families. Unsurprisingly, therefore, China's health system displays considerable inequalities in utilization and outcomes between rural and urban areas and across income groups (Gao *et al.*, 2001; Zhang and Kanbur, 2005; Akin *et al.*, 2005).

## PRICES AND PROVIDER PAYMENT

The incentives facing China's providers are often argued to be one factor explaining their performance, especially their tendency to over-deliver care. In this section, we investigate the link between payments and performance.

### Provider payments in China

Providers in China receive payments from three main sources. The bulk (over 60%) comes from out-of-pocket payments, based on a regulated fee schedule. Insurers – largely social insurance agencies such as CMS and BMI, rather than private insurers, such as China Life – account for another 20% or so. The remaining funds come largely from government subsidies from provincial and county governments, although these account for a decreasing share of providers' revenue.

Government subsidies take two main forms: a general subsidy to cover part of salaries and other operational costs and a specific subsidy for capital investments in infrastructure or equipment (China Health Economics Institute, 2005). Subsidies for operational costs are typically allocated using criteria such as number of staff and retirees or the number of beds. There are, however, examples of local government reforms using other performance criteria. One interesting example is the use of case-volume, with diseases classified into 651 groups, to allocate government subsidies to military hospitals (Li *et al.*, 1999, 2000). Recently, government policy (Central Committee of CPC, 2002) has required county governments to take greater responsibility in the management and financing of THCs to ensure provision of a essential public health programs, but there is little evidence on whether this policy change has actually changed the financing practices of local governments (Xiang *et al.*, 2004).

Most providers still receive some subsidies, ostensibly to compensate for the difference between the regulated prices and actual costs. The importance of that financing gap – and the associated incentive to emphasize the few profitable services – is underscored by a study of hospital costs relative to official prices undertaken in 2000. On the basis of cost-accounting methods, the study found that cost-recovery rates of official fees are very low (16% for hospital registration, 25% for hospital bed and board, 30% for basic surgical operations, 40% for general examinations and treatments), and fees were higher than costs for only 4% of assessed services (Liu *et al.*, 2000).

The emphasis on revenue generation from fee-paying patients and FFS payment from insurers, coupled with the distorted price schedule, gives strong incentives for providers to generate demand for profitable high-tech diagnostics and drugs, while stinting on unprofitable basic services. At the same time, current financing and payment arrangements do little to stimulate health-care providers to deliver immunizations and other public health services, or to engage in the broader determinants of health in the community.

Stakeholders in China widely claim that these factors have led to over-provision of expensive services with generous margins and relative neglect of non-invasive care and public health interventions. Stylized facts supporting this logical conclusion include the rapid adoption of new technology in China's health sector, the rapid growth of hospital revenue per episode, over-prescription of profitable

pharmaceuticals, and double-digit growth of overall health spending. China's high average length of stay is another example of incentives at work, reflecting not only the unclear distinction between acute and long-term care (as in Japan) but also incentives to claim reimbursement for more services on additional days.

Unfortunately the evidence for a causal link from payment incentives to provider performance is not as strong as it could be. Since provider payment interacts with insurance and patient demand, it can be difficult to pinpoint how much inappropriate use is caused by moral hazard or barriers to access, and how much might be supplier-induced demand because of FFS or stinting on the uninsured. Most studies of payment reforms compare average expenditures or expenditure growth rates before and after a payment system change, without a 'control' group or other method for isolating the payment system effect from other factors. Evidence about cost shifting, quality of care, and risk selection is usually only anecdotal, and multivariate regression analysis of provider- and/or patient-level data is rare.

Nevertheless, numerous studies give an indication of the rich array of payment incentive reforms being undertaken in China, and a few indicate what more rigorous evaluation might reveal. We first discuss studies of changes in regulated prices, and then studies of reforms using variants of prospective payment, first in urban areas (where the evidence base to date is richer) and then in rural areas.

### **Price schedule reforms and their consequences**

In 2000, the government sought to reduce the distortions in the price schedule by increasing the prices of professional services and reducing the price of high-tech care. A study in Shaanxi found that this resulted in a shift in expenditures from high technologies to basic professional services and a reduction in growth rates of expenditures for secondary and tertiary hospitals, using four diseases as tracers (Jin *et al.*, 2002). However, a study in Beijing and the provinces of Gansu, Shandong, and Henan concluded that high technologies are still very profitable, encouraging hospitals to acquire high-tech equipment (Bian *et al.*, 2002; Meng *et al.*, 2002; Sun *et al.*, 2005).

The original intention of low prices for basic services was to promote access. During the period that the price structure was adjusted, the central government also proposed implementing price discounts or exemptions for the poor. However, these policies appear to have had limited impact in practice (Meng *et al.*, 2002).

Reform of drug prices has also begun, but again apparently with mixed results. Starting in 2000, the central government began to change its drug-pricing policy from controlling the entire range of prices for all pharmaceuticals to controlling retail prices for selected products only. One rationale for the reform was that cost-effective drugs would be utilized more if the prices of these drugs are reduced (China State Commission of Planning and Development, 2000). The government declared that retail prices should be reduced by an average of 15% before the end of 2001 (China State Drug Administration, 2003). However, a recent study – albeit one based on a small sample – found that the new drug-pricing policy did not work in controlling drug expenditures, because hospitals could maintain high drug revenues by increasing drug utilization and shifting utilization from drugs whose prices had been reduced to high-price drugs (Meng *et al.*, 2005).

### **Moves away from FFS and their consequences: the urban experience**

Beyond reforms to the price schedule, there have been more radical reforms, involving a move away from FFS payment for clinical services as well as drugs. Typically, they have been initiated by social insurers or government. The social insurance bureau of Hainan Province, for example, implemented prospective payment for six key hospitals in January 1997. One study uses claims data for hospital expenditures and a difference-in-difference analysis to isolate the impact of the payment system reform compared with hospitals that were paid on a FFS basis throughout the study period (June 1995–June 1997) (Yip and Eggleston, 2001). The authors find that hospital prepayment was associated with a

slower rate of growth of overall expenditures, program spending, and patient co-payments per inpatient admission, compared with FFS. Reduced expenditures per admission in the prepaid hospitals (by 26–35% and over 50% compared with trends in FFS hospitals) indicate the power of supply-side cost sharing for controlling costs.

In a companion paper (Yip and Eggleston, 2004), the authors report that Hainan's prepayment reform was also associated in particular with a slower increase in spending on high profit-margin services (expensive drugs and high technology services) compared with FFS. Nevertheless, the authors note that caution is warranted, since the expenditure decrease could stem from some combination of reduced quality of care, risk selection, and cost shifting to the uninsured. Unfortunately data were not available to evaluate these other important aspects of the reform.

Jiujiang, one of the original pilot cities for the new BMI, started out using FFS to pay hospitals, but in late 1996 switched to a fixed charge per inpatient day, having experienced a high rate of growth of medical expenditures under FFS (Meng, 2002). In 2001, the city switched again in an attempt to further curb expenditure growth, this time to capitation. After the switch to capitation, medical expenditure per insured inpatient fell from 2320 to 1778 yuan, and the share of drug spending in total spending fell from 76.5 to 59.8% (Jiujiang Health Insurance Office, 2004).

Zhenjiang, the other BMI pilot city, started out using a fixed charge per inpatient day, but in 2001 started to experiment with a diagnosis-related group (DRG) payment method for 82 diseases (Meng, 2002; Wu *et al.*, 2004). Rates were fixed – hospitals could retain any savings but bore the loss if actual expenditures exceeded the fixed rates. Reimbursement rates for each disease were set according to average expenditure incurred over the previous three years in treating the disease in question, less any expenditures deemed unreasonable (Wu *et al.*, 2004). In 2003, the average expenditure for diseases using DRG payment was 25% lower than the province average in the same level hospitals. Unfortunately no micro-level evidence accounting for quality and patient case-mix has yet been made available for these payment reforms.

In subsequent nationwide implementation of BMI, many cities followed the leads of Jiujiang and Zhenjiang in switching to payment methods other than FFS. Many have adopted a fixed charge per inpatient, but not all. For example, in Guangdong Province in 2002, 13 of the 18 municipal cities used this method, two used FFS, two used capitation, and one used a fixed charge per inpatient day (The Project Team, 2003). In some cases, a variety of different payment methods are used alongside a fixed charge per inpatient. In Guangzhou, Dalian, Liuzhou, Mudanjiang, and Xiamen, FFS and DRG payments were also used for some specific diseases such as tuberculosis, mental disease, and late stage treatment of tumors (Lin, 2004). Even less evidence on impacts is available for these cities than for Jiujiang and Zhenjiang.

One city where evidence has recently emerged of DRGs being used to pay insured patients admitted with 13 specific or 'target' diseases is Shanghai. DRGs were used in the last three months of 2004 and again in the same period in 2005. Zhang (2007) employed differences-in-differences and triple differences to estimate the impacts of the DRG payment system on one hospital in the city. The results suggest that the hospital reduced its length of stay during the DRG test periods on patients with the target disease (irrespective of whether the patient was insured or not), but did not significantly reduce its outlays on patients with target diseases during the DRG test periods. The triple difference results suggest that the hospital did not reduce its outlays on insured patients with the target disease during the test periods. Zhang obtains some evidence (although only for one comparison) that the hospital may have raised its outlays (and presumably therefore its revenues) during test periods on *uninsured* patients with target diseases, the author's hypothesis being that hospitals may try to compensate for lower revenues on insured patients by raising outlays and revenues on uninsured patients which are still compensated through FFS.

Interestingly, some providers in China have of their own volition moved away from FFS. For example, some hospitals have introduced DRGs for fee-paying patients. The earliest documented experiment with such DRG pricing was in three hospitals in Ha'erbin county in Heilongjiang in 1994

(Liu *et al.*, 1999). By the end of 2000, 16 hospitals in Ha'erbin had started using DRGs (Yang *et al.*, 2001). Since then, similar use of DRG pricing has been reported in many other parts of China (Bai, 2004; Meng, 2005). The stated objectives for charging self-paying patients a bundled case rate include attracting more business by developing a reputation for transparency in pricing. This interesting pricing strategy, undertaken as hospitals compete for patients, might be encouraged further by purchasers as providers compete for their insurance contracts. Arguably the importance of this development lies in demonstrating that China can move toward prospective payment even while insurance coverage remains far from universal.

Unfortunately, no systematic evaluations of these initiatives are available. However, some preliminary evidence suggests that the adoption of DRGs brought down spending in ways consistent with theoretical predictions. In the Red Cross Hospital of Ha'erbin, total expenditures for acute appendicitis decreased after implementation of DRGs, and the proportion of drug expenditures in total expenditures decreased from 50 to 15% (Yang *et al.*, 2001). In Jining Medical College Hospital, for the five diseases monitored, total expenditure per case decreased by 30–50% following implementation of DRGs, drug expenditure per case fell by 34–64%, and average length of stay fell by 0.4–2 days (Yin, 2004). It is unclear how much of these changes stem from the payment reform itself rather than other contemporaneous trends. Moreover, nothing appears to be known about the effects of DRG adoption on quality of care, 'cream skimming' or 'dumping' (providers deliberately avoiding the more complicated cases within each diagnostic group).

There have also been some experiences with alternative provider payment methods for outpatient care. For example, Shanghai's government insurance program switched to capitation payment for outpatient care (Yang *et al.*, 1999). While findings indicate a slowdown in spending growth, reform design and available data do not permit a rigorous assessment.

In many cases, provider payment reforms have been introduced in conjunction with other health system reforms, and evaluations have focused on the overall impact of the package. For example, Meng *et al.* (2004) report on a comparison between Nantong, an urban health insurance pilot city that implemented both provider payment reforms and new forms of contracting, and Zibo, a city that did not implement reforms. They find a smaller cost-increase in Nantong, without measurable impact on quality. Similar results have been found in other studies (Liu *et al.*, 2003).

Moving completely away from FFS to a fully prospective payment system can be risky – providers may skimp on quality or increase volume of cases unless the payer can effectively monitor quality and quantity. Prospective payment systems generally also create incentives for risk selection, and risk adjustment systems developed to date can be difficult to implement and often leave considerable room for gaming (Newhouse, 1996).

In China, some steps have been taken to promote quality and deter misconduct by hospitals or other providers. For example, in Qingdao, where a global budget has been used, payments to hospitals have been reduced if they admitted fewer than 95% of the number of patients they had admitted the previous year (Qingdao Municipal Department of Labor and Social Security, 2003). Some BMI schemes have set up independent quality reviews by expert panels or routine monitoring of high-tech services. Most NCMS schemes have also established contracts that specify the package of services providers are to deliver, payment methods, quality standards, and other criteria (Meng, 2005). In some cases, contracts with providers have included provisions for terminating the contract if, for example, patients were not charged in accordance with the established price schedule (Yuexi County NCMS Office, 2003; Yanzhou NCMS Office, 2004).

### **Moves away from FFS and their consequences: the rural experience**

In the rural sector, alternatives to FFS have also been tried, although no evidence on impacts appears to exist. In two counties of Xinjiang, the county government – through the NCMS fund – paid 40–50 yuan

per month to each village practitioner. In return, the village doctors provided free diagnosis and treatment, except for certain items – such as a delivery – for which they received additional fees (Hu, 2003). In Kuanyang township of Guizhou Province, all contract village clinics were managed by THCs for purchasing and charges for drugs. Payment of village practitioners included three parts: a basic salary, an indicator-based bonus (indicators included the number of home visits and patient satisfaction), and a performance-based bonus that included cost containment. The basic salary was 300 yuan a year for each practitioner (Wang, 2003). In Wushe County in Henan, each household contributed 10–30 yuan to an insurance fund. Village clinical practitioners were contracted to provide free physical examinations once a year. The NCMS members were also entitled to receive discounts ranging from 15 to 20% for defined services in village and township health facilities (Health Bureau of Wushe County, 2002). In Wuxue County in Hubei, the NCMS pays village doctors and THCs by capitation (10 yuan for the village and 10 yuan for the THC per member per year) for defined basic health services. If the NCMS fund is not balanced, 70% of the deficit should be covered by THCs and the rest is covered by village clinics (Hu, 2003; Wang *et al.*, 2003, 2004). In two counties of Gansu Province, NCMS has reportedly used DRG payment (Meng, 2005).

### **Informal payments**

Finally, as in many places in the world, some providers augment the official ‘price’ with under-the-table payments or ‘gifts’ at the point of service delivery (called *hongbao*, ‘red packets’). Although evidence is limited, this practice appears to be widespread in China. One study, for example, revealed that 21% of doctors said that they accepted red packets to compensate for low pay, 59% refused for ethical reasons, and 15% declined for fear of punishment (Bloom *et al.*, 2001). Hospitals themselves report average informal payments between 140 and 320 RMB, while referral hospitals have averages over 400 RMB. Perhaps unsurprisingly, surgeons, obstetricians, and anaesthesiologists tend to receive more informal payments than others. An overview of several Chinese studies finds that a majority of inpatients in several different surveys reported making informal payments. Recent reforms have targeted these practices as well as other forms of corruption in the health sector (such as kickbacks to doctors from pharmaceutical companies). Evidence on the impact of crack-downs is limited to media reports and anecdotes.

## **OWNERSHIP**

The private sector plays a sizeable and growing role in the delivery of health services in China, especially in rural areas. In this section we document the trends, and present evidence on the consequences of ownership reforms.

### **Ownership patterns and trends**

Starting with the legalization of private practice in the early 1980s, *de novo* private entry and ownership conversions – typically from government to collective or private ownership – have been widespread. Private for-profits are common among clinics (73.6% private) and outpatient departments (48.3% private). By 2005, nearly 15.9% of hospitals were registered as for-profit, with for-profit status being particularly prevalent among specialized hospitals (see Figure 1). These statistics do not reflect the full private presence in the health sector because they neglect private nonprofit organizations, although this ownership segment appears to be minimal in China currently (Liu *et al.*, 2006). Moreover, since non-governmental hospitals are generally smaller than their government counterparts, the private market presence as measured in terms of inpatient beds or outpatient visits has not yet increased beyond the single digits, even in most large coastal cities (Eggleston *et al.*, 2005).

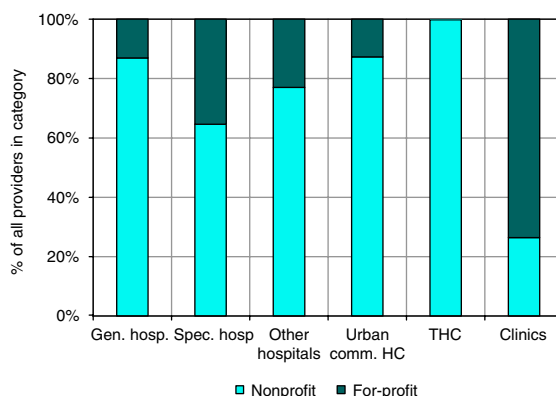


Figure 1. Who delivers health services in China? *Note:* Data are from the 2006 MOH Health Statistical Digest (online) (Ministry of Health, 2006) and refer to 2005. Estimates exclude a small number of providers (<1%) that have not yet been classified. The 'nonprofit' category mainly consists of organizations owned by government and enterprises (available data do not permit a disaggregation of the nonprofit category by ownership)

The private sector has grown both through privatization and new entry. Initially, ownership conversions were most common at the village level, where the collapse of communes and the previous cooperative schemes undermined the financing basis for collectively run clinics. Later in the 1990s, several forces converged to spur ownership conversions above the village level, including fiscal constraints, frustration with the performance of hospitals and health centers, and successful experiences with ownership reforms in other sectors (Liu *et al.*, 1996; Li, 2000; Xu, 2001; Li and Song, 2002; Wang and Liu, 2002; Meng, 2005).

Many ownership reforms have taken the form of joint stock operations, resulting in share-holding by a mix of public agencies, private individuals, and institutional investors. In some cases, hospital staff or other investors purchased the fixed assets or contractors leased them. Ownership reforms at county level have been more limited (Qi and Feng, 2000). Whereas the emergence and growth of the private sector in rural areas has primarily been through ownership conversions, new entry in both hospital and ambulatory care markets, including through joint ventures with foreign investors, has been more important in urban areas (Wang and Zhang, 2002).

### Evidence on effects of ownership and profit status

The evidence on the effects of ownership and profit status conversions in China is mixed. Studies of rural clinics have found that non-government and government providers are just as likely to over-prescribe drugs, and for-profit providers are just as likely to deliver preventive activities as public ones, provided they are paid properly to do so (Meng *et al.*, 2000). Surveys of ambulatory care patients find not only a high level of satisfaction with the responsiveness of private providers but also some patient concern about the qualifications and motivations of private providers (Lim *et al.*, 2003).

A few studies have found that THC privatization has been associated with a reduction in cost (Li, 2000; Wang *et al.*, 2002). However, it remains unclear whether these cost reductions result from efficiency gains, maintaining quality, and scope of services, or whether they result from scaling back preventive care, public health activities, and other unprofitable services. There are cases, for example, where public health functions were separated from the THC after it was transformed, thus severing the institutional link between primary curative care and public health and also undermining the financing of preventive services (Li, 2001; Wang, 2002; Wang *et al.*, 2002; Xu, 2003). Partly as a result of these

challenges and possibly also in response to government policy, some localities have re-converted privatized THCs to public ownership.

Very few studies rigorously assess ownership differences of inpatient care in urban areas. The few that give suggestive evidence provide mixed messages about relative quality and efficiency (Eggleston *et al.*, 2005). Given the scope of reforms, this area merits more systematic evaluation, including investment in better facility- and patient-level data sets.

## ORGANIZATION, REGULATION, AND MANAGEMENT

The performance of any delivery system reflects a number of organizational choices. For example, a well-functioning referral system can lower cost and enhance equity (Gerdtham and Jonsson, 2000). In its transition from the old system, China lost this: patients now choose whichever level of provider they can afford; hence, the higher-level (e.g. provincial and county) hospitals are often overloaded with patients, and the lower-level hospitals (e.g. township) are underutilized and patronized by mostly low-income patients. Partly in response, some regions have discussed re-instating referral systems or tiered co-payment requirements, and some BMI patients must designate a specific hospital or clinic as their ‘appointed’ provider (*dingdian yiyuan*). Some rural health insurance experiments also give incentive for utilization at the primary care level, although this is not a consistent feature in the design of the NCMS.

Other oft-mentioned organizational dilemmas include overlapping functions and fragmented service delivery responsibilities. For example, family planning institutions, THCs, and maternal and child health facilities in China have overlapping functions. Ministry of Health, military, and enterprise hospitals all provide similar services, increasing competition but also contributing to excess capacity and lack of coordinated care for patients that seek care from multiple providers. And there are also questions about the roles and responsibilities of different levels of government in service delivery. Several studies have found that decentralization in China has had a negative impact, especially on equity of services between richer and poorer regions (Tang and Bloom, 2000).

### **Integration and its consequences**

Vertical and horizontal integration are approaches that can address several macro-organizational challenges such as lack of referral systems and fragmented care. One alternative already pursued by some counties in China to address the underutilization at township level has been to vertically integrate village clinics with THCs – the THCs become the owners of the village clinics. The stated aim of the reforms has been to improve quality of care by controlling drug quality and staff competence, often in the hope that such improvements would increase the utilization and revenues of THCs. It has also been suggested that an important motivation for integration in some cases has been to ensure the financial survival of THCs and increase the incomes of THC staff by shifting revenues from drug mark-ups from village to township level (Qianyang Health Bureau, 2004). These reforms have taken different forms, and have often included a consolidation and rehabilitation of village clinics, and increased control by county authorities or THCs in the allocation and supervision of village-level health workers (Liang and He, 2003; Qianyang Health Bureau, 2004). There are also examples where the county government or the THC bought the assets of the village clinics, and where the village doctor was made a salaried staff of the THC (Qianyang Health Bureau, 2004). Some counties have introduced defined village-level service packages focusing on infectious disease and maternal and child health as part of vertical integration (Wang *et al.*, 1997; Pan and Yan, 2004).

The benefits of vertical integration of village and township providers have not been evaluated formally. Nonetheless, some studies report improved provision of preventive care as a result of better capacity at village level and increased technical guidance from THCs (Wang *et al.*, 1997; Liang and He, 2003; Pan and Yan, 2004). Other studies have claimed that integration reforms have improved drug

safety (Wang *et al.*, 1999). Integration may also have brought other important benefits – e.g. increased efficiency, improved health-care quality, better referrals – but unfortunately studies to date do not shed light on these issues. While the evidence is currently thin, vertical integration of THCs and village clinics may be an important way of strengthening quality control and improving performance of primary health services in some parts of China.

### **Licensing and accreditation**

Separate from formal integration, regulation through licensing and accreditation are important complementary policy instruments for improving provider performance. Most village clinics are operated as small businesses, although the actual facilities may be owned by the government or collective, and village providers are formally covered by licensing and certification requirements. In 1999 the *Law on Physicians* raised the training requirements for medical practice licences and for some professional categories. The *Village Doctor Practice Regulation*, which took effect in 2005, requires village doctors to be certified physicians or assistant physicians before being entitled to a license.

Enforcing these regulations presents a considerable challenge. A recent study on village doctors in the Beijing area found that only 65% of randomly selected village doctors have a secondary technical school degree or equivalent training, while the remainder did not have any medical training or qualifications beyond high school (You, 2003). A similar study on 46 poor counties in the western provinces found that 70% of village doctors had no more than a high school education and had received an average of only 20 months of medical training (Wang *et al.*, 2003). In part, this reflects the continuing practice of many former bare-foot doctors.

Some local governments have taken measures to increase average provider skills. For example, one county in Jiangsu required all village health workers to sit and pass a technical exam in order to continue to operate (Zheng, 1998). Another county health bureau fired 80 village health workers who failed to pass a skills assessment and temporarily re-assigned health workers from the THC to serve at village level (Yang *et al.*, 1998).

Chinese hospital accreditation began in 1989 with a system established by the Ministry of Health. This system defines three hospital grades (3, 2, and 1) based on infrastructure and administrative level and three within-grade levels (A, B, and C) based on evaluation by a committee established by the local health bureau. Since 2005, the hospital accreditation system rates hospitals according to a wider range of criteria, including ‘scientific management’, patient safety, and service quality, and allows for rewards (e.g. government budgetary subsidies) and sanctions (e.g. fines or risk of closure) (Ministry of Health, 2005b). The national accreditation guidelines give local governments considerable discretion in implementation, which limits comparability across regions. Many provinces do not include the private sector, and few include THCs and village clinics.

### **Management reforms**

Quality and efficiency are also affected by the internal structure and management of delivery organizations and regulation of service standards. Most providers at township level and above have traditionally been government-owned public service units that have little control over selection, hiring, firing, and compensation of staff. The quota for ‘permanent’ or ‘formal’ staff has been based on administrative decisions by the local government, with involvement from the planning department, the personnel bureau, and the bureau of health. In contrast, when it comes to ‘contract staff’, the hiring institution has not only full autonomy over hiring and firing but also carries the responsibility of paying for salary and benefits. This ‘duality’ in the personnel system contributes to inappropriate staffing patterns and limits the ability of hospital and health center managers to reward or discipline the workforce.

Local experimentation in hospital management changes has been widespread. This has included making the selection of managers and staff more transparent and competitive, as well as increased reliance on outsourcing of support services (i.e. competition in input markets), such as facility management, cleaning, restaurant services, security, and supply management (Jia, 2003; Ye *et al.*, 2003; Xiang and Yang, 2004). Other initiatives have focused on improving information and financial control, such as through investing in health management information systems. Contract management has also been used by, for example, the local health bureaus in Wuxi City (Yang, 2003).

To date, very little is known about the impact of management reforms. The study in Zibo and Nantong found that the main factors influencing unit cost, length of stay, and other efficiency indicators were the bonus system, competition for hospital positions, selection of staff, and the accountability system. More systematic evaluations of management reforms would contribute significantly to this literature.

## CONCLUSIONS

A growing body of literature in Chinese and English provides researchers and policymakers with description and analysis of China's evolving health-care delivery system. Given the data constraints and methodological limitations of this literature, one must be cautious in drawing conclusions. Nevertheless, a critical reading of the available evidence suggests that current health service delivery in China leaves much room for improvement, in terms of quality, responsiveness to patients, efficiency, and equity. This Chinese experience matches theory and global evidence, namely that system-wide incentives – including pricing and payment methods, ownership, competition, organization, regulation, and management – shape provider behavior.

The Chinese and international experience offer some lessons on how to harness system incentives for improvement. Unfortunately, there are no quick fixes. Simply shifting ownership to the private sector or simply encouraging providers – public and private – to compete with one another for individual patients are unlikely to solve these problems. In fact, without complementary reforms, privatization and competition for patients will likely exacerbate existing problems of risk selection and distortions in services by profitability.

The interaction of incentives calls for a systematic approach to reform. Elements of an effective package for China might include strengthened provider-payment reforms, appropriate vertical and horizontal integration, improved provider management, and sector-neutrality (i.e. supervision and regulation applying to both public and private providers, and purchasing from higher-performing providers on equal terms, regardless of ownership). Active purchasing by organized purchasers can be an especially potent way to affect system incentives. If the BMI and NCMS agencies can evolve into responsive advocates for the populations they serve, they could play a key role in improving service delivery. An important way of doing so would be by using new forms of paying hospitals and other providers and by expanding the use of contracts and other accountability mechanisms. These strategies could in turn spur desired changes at the market and organizational levels, such as the aforementioned horizontal and vertical integration and improved organizational management.

While some of the problems observed in the Chinese health sector today can be traced to excessive or inappropriate government intervention, other problems arguably arise from the government doing too little. Information asymmetries and other market failures call for effective government regulation in the health sector. For example, regulation of advertising can play an important role in protecting population health and reducing information asymmetries – e.g. in relation to tobacco. There is also an important place for regulation of behavior in insurance and health-care markets, such as preventing price collusion and 'cream-skimming', monitoring quality, protecting patient privacy, and providing information. In health systems that allow a prominent role for markets, antitrust policy is a crucial tool

for establishing a ‘fair playing field’. In most health systems, the government also plays an important role in relation to the health workforce. China clearly has major challenges to increase provider medical and management quality and to ensure that the distribution of health workers reflects need.

In China, as elsewhere, health sector reforms affect the income and well-being of many powerful supply-side interest groups (Roberts *et al.*, 2004) and reform design, implementation and evaluation must take account of the complicated political economy of institutional change. New reforms must often include concessions to ‘losers.’ For example, the impacts of payment reform on cost control in Korea and of the separation of drug prescribing and dispensing in Taiwan were reduced due to the increased payment rates introduced to obtain provider acceptance (Chou *et al.*, 2003; Kwon, 2003). Policymakers in China must similarly confront formidable entrenched interests if reforms away from the *status quo* are to be successful. Fortunately China has considerable experience from other sectors in using a combination of policies to pursue ‘reform without losers’ (Lau *et al.*, 2000). Policymakers and researchers bear responsibility in monitoring reforms – from design to evaluation – to assure that the welfare of the poor and most vulnerable Chinese receives a voice.

Finally, we conclude with some observations about how further analyses could most contribute to strengthening the evidence base of health-care delivery policy in China. Probably the greatest need is for investment in better micro-level provider data sets. Improved measures of quality and patient case-mix will be vital for comparing performance of providers, both across markets and over time. To study the rich tapestry of local quasi-experiments unfolding in China, researchers need to identify appropriate comparison groups and control as much as possible for confounding factors when estimating the impact of reforms. Eventually it should be possible to analyze a nationally representative sample of patients and providers, such as by linking national health survey household data to facility-level data and patient claims, and to use detailed process and outcomes data to study overall productivity or social value (i.e. the value of improved patient outcomes, net of resource use). With these better data, rigorous evaluations can provide sound evidence about which policies are most effective in improving Chinese health-care delivery.

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