

# Health Provider Payment Reforms in China: What International Experience Tells Us





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## China Health Policy Notes

*China Health Policy Notes* is a series of occasional papers on lessons and experiences from China's ongoing healthcare reform. The series is published by the World Bank in collaboration with the Government of China. The papers track and analyze the reform process, and evaluate early results. Each paper focuses on a key challenge that is central to success. The papers are written from a pragmatic perspective—namely, how the reforms can be refined and improved as the process unfolds over the coming 5 to 10 years. Experience is reported in the context of international best practice.

Research was carried out under the World Bank's Analytic and Advisory Assistance program, a particularly fruitful collaboration between the Bank and the Government that has been underway since 2003. Initial technical papers prepared by teams of national and international experts. Preliminary versions were critically discussed with Chinese policymakers and technical counterparts, especially within the ministries that initially requested this assistance in mid-2008. All papers were then subject to a rigorous process of peer review.

The purpose of *China Health Policy Notes* is to share these findings with a broader audience, especially to Chinese policymakers, health specialists, and scholars. Hardcopy versions of these papers can be obtained in English and Chinese by writing to the World Bank. They can be downloaded without charge at [www.worldbank.org](http://www.worldbank.org). The papers may be freely reproduced providing that source and copyright protection are clearly acknowledged. Comments and ideas are welcome. They should be addressed to the respective authors, or to the series editor ([jlangenbrunner@worldbank.org](mailto:jlangenbrunner@worldbank.org)).

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*Opinions expressed in these papers are entirely those of the authors. They do not represent official views of the Executive Directors of the World Bank, the UK Department of International Affairs, or the Government of China.*



# Health Provider Payment Reforms in China: What International Experience Tells Us



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## Acronyms, abbreviations, currency

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AAA	World Bank Analytic and Advisory Assistance
ABF	Activity-based financing
ARH	<i>Agence Regionale de l'Hospitalisation</i>
AR-DRGs	Australian Refined Diagnosis Related Groups
CDM	Chronic disease management
CHCs	Community health centers
CMS	Center for Medical Services
CPOL	Care Plan On-Line
CUPs	Contracting units for primary care
DRGs	Diagnosis-related groups
FFS	Fee-for-service
GHM	<i>Groupes Homogenes de Malades</i>
GP	General practice/General practitioner
HMO	Health maintenance organization
HRG	Healthcare resource group
IANR	Intended average net remuneration
ILO	International Labor Organization
LKF	<i>Leistungsorientierte Krankenanstaltenfinanzierung</i> .
MA	Medical Assistance (a social welfare program for poor families)
MOH	Ministry of Health
MOHRSS	Department of Human Resources and Social Security (MOHRSS)
MOLSS	Ministry of Labor and Social Security
NCMS	National Cooperative Medical System
NHS	United Kingdom National Health Service
NGO	Non-Government Organization
NRDC	National Reform and Development Commission
OECD	Organisation for Economic Cooperation and Development
P4P	Pay-for-Performance
PbR	Payment by Results
PCG	Primary Care Group
PCT	Primary Care Trust
PMSI	<i>Programme de Medicalisation du Systeme d'Information</i>
RBF	Result-based financing
RSC	Risk structure compensation
SRE	Separating revenue and expenditure
UEBMI	Urban Employee Basic Medical Insurance
URBMI	Urban Resident Basic Medical Insurance
USAID	United States Agency for International Development

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**Exchange rate**

6.82 RMB = 1 USD

(May 1, 2010)

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# Executive Summary

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**T**his paper examines health provider payment reforms in China—the present system and how it evolved, and changes that would improve it in the context of ongoing health reform. The paper begins with a brief introduction and background discussion followed by two substantive sections—experiments with case-based payment systems, and experiments with alternative government budget payment methods. This is followed by an examination of what has worked in China and elsewhere. The concluding discussion considers lessons for China and next steps.

## Background

The 2003 SARS outbreak led to rapid increase in government investment in public health care. The National Cooperative Medical System (NCMS) was launched in 2003, and coverage under the Urban Employee Basic Medical Insurance (UEBMI) was extended. The pilot Urban Resident Basic Medical Insurance (URBMI) was launched in 2007 for people outside the formal economic sector. The community health care system received more financial and political support, and in 2006 top leaders promised to establish a universal coverage system for basic health care.

Many policy instruments and reforms have been implemented to use NCMS, Basic Medical Insurance (BMI), and government health budgets more efficiently. These include alternative payment systems, reduced drug prices, essential drug lists, controlled use of high technologies, and strengthening the primary healthcare system.

Payment system reforms have focused on two areas in recent years—first, a case-based payment system in NCMS, BMI, and individual hospitals; and second, reforming methods of government budget allocations to primary health providers. This review analyzes the impact of these two reforms on cost containment, utilization, and the quality of health care.

## The case-based payment system

A common problem with case-based payments, including NCMS and BMI, is the limited numbers of diseases that are covered. If too few diseases are covered, the overall effect on cost containment is limited. Billing departments can “game” payers by coding cases that are profitable and billing outside cases when costs exceed the maximum limits.

The case-based payment system might contain costs, at least for patient out-of-pocket costs, but it may lead to concerns about quality of care. Health providers can employ tactics

such as reducing the length of patient stays, increasing readmissions, admitting outpatients who do not need to be hospitalized, and treating patients inappropriately.

Because of such possibilities, any assessment of the effectiveness of case-based systems must examine overall medical expenditures. Reducing medical expenditures on *covered* diseases will not reduce expenditures for *all* diseases, because costs of covered diseases can be shifted to diseases outside the payment system—as was shown in Zheng’an, where medical expenditures on diseases outside the case-based payment system increased rapidly. Rigorous studies have not been carried out on cost-shifting behavior, but a case-based payment system that covers relatively few diseases is unlikely to have a significant impact on overall medical expenditures.

Compared with fees-for-services, another concern with case-based payments is the reduced use of resources in treating covered diseases. Even if NCMS and BMI monitor and investigate patients’ satisfaction, quality will not necessarily improve, because information asymmetry across health providers, regulators, payers, and patients may still result in inconsistent incentives for these groups. More systematic assessment is needed in this area.

### **The way forward: Case-based payments or DRGs?**

Three aspects of case-based payments have proved popular. First, a case-based system is generally easier to design, develop, and manage than Diagnosis-Related Groups (DRGs). Organizers can select a few diseases for case-based payment systems, whereas with DRGs, it is more complicated to classify every disease into an exhaustive set of groups for payment. Individual hospitals can implement case-based payments with selected diseases, in contrast to a DRG system, which typically requires third-party inputs from either government agencies or insurers. A DRG system may require data from several hundred thousand cases. This means that NCMS and BMI will have to carry out data collection and analysis on a continuous basis.

Second, hospital information systems must be further developed before DRGs can be fully implemented. Rural NCMS data systems have improved significantly, but still lack adequate coding space and coded data of diagnosis categories.

Case-based payment experiments have not worked well in places where only a few diseases were covered and no other efforts were made to support new payment systems. Weak management and information systems also affect implementation of case-based payment experiments.

Finally, the current incentives are increasing numbers of admissions; DRGs and case-based payment may need to be “blended” with hospital global budgets as has already been tried in Chongqing.

## Alternative government budget payment methods

Many other reforms in government health budgets were carried out during the latter half of the 2000s, especially in urban areas. The goal of alternative government budget payment methods is to achieve higher quality health care, greater appropriate utilization, higher public satisfaction, more efficient resource use, and reduced costs. A form of accounting known as Separating Revenue and Expenditure (SRE) has been popular recently. In SRE, revenues generated from user charges are handed to the government finance authority, pooled with budget funds, and allocated with the government health budget. The funds are returned from the finance authority to health providers are determined by an assessment or by a fixed percentage.

SRE impact studies are scarce partly because of relatively recent implementation, but SRE appears likely to have had positive impacts on medical costs, health workers' behavior, health care utilization, and public satisfaction. Yao et al. (2007b) reported several positive impacts of SRE, including cost containment, health care utilization, drug prescription behavior, public satisfaction, and financial sustainability. Elements of these pilots were integrated into China's national health reform plan that was announced in April 2009.

Other options piloted have been "Pay-for-Performance," or P4P, and more recently outpatient capitation has emerged for primary care and outpatient services as increased outpatient pooling.

## International experience

Reimbursement mechanisms for health care institutions and workers can be divided into time-based, service-based, or population-based. With time-based payment, providers are paid according to time spent providing the service irrespective of the number served. In service-based remuneration, payment depends on the number of services provided or patients treated. Population-based remuneration is payment according to the size and composition of the population served by the facility irrespective of the number of patients actually attending.

The input-based approach allows no flexibility to respond to local needs or changes in technology or treatment patterns. Basic population norms encouraged a certain degree of input-dominated equity, but the actual distribution was influenced both by the initial distribution of facilities and political, social, and economic factors. Areas that generated more revenue had greater influence over their share than those with lower revenues.

Many countries have moved away from input-based budgets and salaries for providers. With a new purchaser-provider split for insurance (as in China now), individual providers (as employees in facilities) of insurance schemes are sometimes taken out of civil service, as in Estonia. Employees may be protected by employment laws, but they then contract with

facilities, not with the government. Facilities typically have some flexibility to hire new employees and let unneeded staff go. The system of payment is then re-oriented towards services or activities, as measured by outputs or even outcomes. Today, sophisticated purchasers link payment with service performance, service outputs, and ultimately, patient health outcomes (although the latter is still not used much). They may also couple “performance-based” mechanisms with demand-side mechanisms such as co-payments or deductibles.

Service-based approaches can be categorized by the unit of service, and payment is typically made by purchasers on a retrospective basis after the service is rendered. “Fee-for-service” (FFS) as used in China pays for basic units of services to individual providers, such as office visits, x-rays, or laboratory services. The level of remuneration under FFS can be determined retrospectively or prospectively (as in Canada and in Japan).

For inpatient care, per day (“per diem”) payment is often the first basic unit of payment beyond FFS that purchasers utilize. Like FFS, per diem methods are administratively straightforward but can encourage increases in volumes (overproduction) of services. Per diem is being piloted in Lu Feng county in Yunnan Province with some success.

During the last two decades, new and more sophisticated payment systems have evolved with units of payment becoming broader, and prices for bundles of services set mostly on a prospective basis. Purchasers have adopted fixed-price payments for defined products that mimic clinical episodes, such as an ambulatory surgery, and for inpatient stays. Fixed-price payments, if administered correctly, control costs and improve efficiency. This approach removes incentives for hospitals to over-provide services. DRGs are the best example of these mechanisms. With its effectiveness in lowering costs and improving efficiency, many countries have adopted some form of DRG payment system but with modifications to counteract the negative impact of DRGs. Perverse incentives with DRGs include risk selection, “up-coding” patients to more costly groups, providing intensive treatment to shift patients to higher cost categories, and the lack of motivation to improve quality.

Two methods are most promising for China in light of international experience so far: innovative DRG payment for hospitals, and pay-for-performance (P4P). These are not mutually exclusive. P4P can be combined with capitated budgets for primary care providers or DRG payments for hospitals. P4P has seen a resurgence recently. It is widely viewed as a tool both to improve the performance of providers and to improve quality and actual health outcomes.

A review of P4P in disease-specific programs showed incentives at the provider level such as direct payment, food packages, vouchers, other material goods or free drugs to private providers. Globally, P4P programs cover a range of measures including process and outcome measures (case detection, appropriate referral, treatment completion or cured patient), and reward providers at the individual provider and the institutional or team level.

A significant impediment to P4P in the developing world is the initial financial outlay to set up adequate performance monitoring and measurement systems. Lack of data to establish indicators or targets may delay or even halt implementation in some countries. Other steps needed for P4P success include: adequate communication of the new incentive program to providers; frequent monitoring and evaluation; and administrative management to ensure that incentives are appropriately distributed. Frequent evaluation and flexible implementation is needed to counter problems that may arise. Programs that have shown the most success are often uncomplicated in that the focus is a single activity, respond to a specific disease, have standardized treatment, have fewer than ten indicators, or have a specified quantity of care defined.

P4P also has limitations. In any system that rewards behavior, individuals may “game” the system for more reward. Requiring providers to provide data may encourage them to falsify reports. Unmeasured activities may decline as providers focus on measured indicators. Eichler and Levine list seven possible mistakes in designing these P4P incentive systems:

- Failure to consult with stakeholders on the design of incentives;
- Failure to adequately explain rules;
- Entailing too much or too little financial risk;
- Having too many or imprecise definitions of performance indicators or unreachable targets for improvement;
- Tying the hands of managers so they are unable to respond to the new incentives;
- Paying too little attention to systems and capacities for administering programs; and
- Failing to monitor unintended consequences.

## **Lessons and next steps for China**

First, although P4P has gained momentum as a way to improve provider performance, implementing P4P in China must be carefully conducted. The P4P model often leads providers to focus on activities for which performance is measured, and it neglects those for which payment is not tied. Strong P4P incentives for some services may reduce quality of other services. Success with P4P depends on good monitoring and objective data.

Second, for China to have a sustainable healthcare system, it must reform its delivery system. The current system is fragmented and hospital-based. It is not focused on real utilization of cost-effective primary and outpatient care, and is not suitable for a population that is increasingly affected by chronic conditions which often require integrated and coordinated care across a number of providers. Mechanisms such as primary care capitation can be utilized to help restructure the delivery system.

Third, provider payment does not act on its own. The context in which providers work affects how provider payment manifests itself. For example, providers in solo practice behave differently than those who work in group practice, even if both are subject to FFS payment. The latter is also affected by norms set by the practice. The current discussion of provider payment in China has often not fully integrated these organizational factors.

Fourth, although many hospitals in China are moving towards DRG payment systems, there is little focus on how incentives can be transferred to physicians working in hospitals.

Fifth, the extent to which provider payments affect provider behavior depends on the market share of payers who initiate payment changes. In urban areas where there are separate insurance schemes, unless the incentives of the different payers are aligned, the effect (or “bite”) of each payment method on a provider’s income will be limited. Similarly, if physicians have multiple jobs, the effect of incentives from each “job” will be limited.

Finally, provider payment incentives are not a panacea for affecting provider behavior. Many other factors, including professional ethics and the effect on the relationship between physicians and patients, must be developed in parallel with provider payment change.

# Health Provider Payment Reforms in China: What International Experience Tells Us<sup>1</sup>

## 1. Introduction

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Following intensive discussion, deliberation and debate, in April 2009 China unveiled its healthcare reform plan (Anonymous 2009; Chen 2009). President Hu stated that the goal of the reform is to assure that every citizen has equal access to affordable basic health care by 2012. This policy states that the government's role in the healthcare sector is to ensure equity and the provision of public goods, while encouraging the exploration of purchasing, competition, and other market mechanisms to improve quality and efficiency.

The Chinese government announced that it would spend an additional RMB 850 billion (\$US 25 billion) between 2009-2011 to provide universal basic health care for its population of 1.3 billion. The reform is anchored in five areas:

- Expand insurance with a goal of universal coverage by 2015, with subsidies for the rural population to enroll in the National Cooperative Medical System (NCMS) and for the urban uninsured to enroll in the Urban Resident Basic Medical Insurance System (URBMI);
- Increase government spending on basic public health services, especially in lower-income regions;
- Establish primary-care facilities (community health centers in urban areas and township health centers in rural areas) to serve as initial providers in the long run;
- Reform the pharmaceutical market; and

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<sup>1</sup> This paper was written by Professor Meng Qingyue, Shandong University; Professor Winnie Yip, Oxford University (UK) and City University of Hong Kong; and Jack Langenbrunner, World Bank. The authors wish to thank external reviewers Bjorn Olof Eckman (World Bank) and Hu Shanlian (Fudan University) for their many helpful remarks. Comments should be sent to [jlangebrunnere@worldbank.org](mailto:jlangebrunnere@worldbank.org).

- Pilot test public hospital reforms.

The major challenge is assuring that additional funding will result in effective services. Internationally, provider payment has been important in improving quality and efficiency. China knows that improving quality and efficiency is needed to improve the population's health, and that if costs are not controlled, insurance schemes cannot be sustainable.

## 2. Background

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The 2003 SARS outbreak led to rapid increase in government investment in public health care. The National Cooperative Medical System (NCMS) was launched in 2003, and coverage under the Urban Employee Basic Medical Insurance (UEBMI) was extended. The pilot Urban Resident Basic Medical Insurance (URBMI) was launched in 2007 to target people outside the formal economic sector. The community health care system received more financial and political support, and in 2006 China's leaders promised to establish a universal coverage system for basic health care.

The NCMS has rapidly expanded, and by September 2009, more than 95 percent of rural counties implemented NCMS, covering over 800 million rural residents (MOH, News Press Office 2008). Nevertheless, NCMS faces several challenges, including inefficiency in using funds, inequality of health care use across income groups, and limited improvements in the quality of care that is provided (Jiao Yan et al. 2006). By the end of 2006, UEBMI covered 157 million urban employees, or about 40 percent of the urban population (MOLSS 2007), but controlling medical expenditures has been a critical issue.

To some extent, the government health budget in urban cities has been directed to community health care organizations, especially after the senior policy conference for community health care in February 2007. Using this increased funding efficiently and equitably by community health providers must be addressed, particularly as the community health care system now used in urban cities will be followed by rural communities.

To improve efficiency using NCMS funds, BMI funds, and government health budgets, many policy instruments and reforms have been implemented, including alternative payment systems, reducing drug prices, using essential drug lists, controlling use of high technologies, and strengthening the primary healthcare system.

The rationale for new payment systems is based on the association between rising medical care costs and fee-for-service (FFS) payment methods. There are nearly 4,000 fee items in the FFS scheme, either out-of-pocket payments by consumers and families or by third party payers. With this system, health provider incomes are closely linked with the volume of medical care. Since the early 1980s, health providers have relied on user fees for operations and have used revenue surpluses for remuneration, bonuses, and other welfare programs for health staff. Health providers have strong incentives to generate revenues from user charges. Regulators and administrators lack the capacity to monitor the provision and cost of health care with so many fee items. FFS financial incentives for health providers, together with weak regulation of health providers, have led to overuse and

unnecessary treatments and drug prescriptions. For example, He Ping (2009) found that 50 percent of hospital admissions in Chongqing were unnecessary. The Fourth National Health Survey (2009) estimated this figure at nearly 30 percent nationally.

The method of allocating government funds for health providers may be part of the problem. The government health budget is allocated to health providers as line item budgets based on numbers of registered health staff and hospital beds, with no link to output. Line item budgets and FFS are a toxic mix of poor incentives. Line item budgets encourage oversupply, while FFS uses the government-fostered supply infrastructure to induce demand for unnecessary services.

In the 2005 review of health provider payment reform (Meng 2005), payment methods used by different payers—including out-of-pocket payers, NCMS, BMI, and government funds—were described and analyzed, along with experiments of payment systems including DRG, capitation, and prepayment for maternal and child health. As some experiments, such as the DRG method in NCMS, were in the design and exploration stage, much of the impact of these alternative payment systems was not analyzed.

This policy note provides an update of health provider payment reforms over the past five years, based on the 2005 review. Methods used include a review of published studies, a review of grey documents, and informal interviews with key informants. The note then discusses international experience and potential lessons for China.

In the past five years, payment system reforms have focused on two areas: using a case-based payment system in both NCMS and BMI schemes and individual hospitals, and reforming methods of government budget allocations to primary health providers.

The case-based payment system is called diagnosis-related groups (DRG) in much of the Chinese literature. DRGs is a payment method that uses pre-set rates for many groups of diseases, while the case-based payment system sets rates for each disease (such as heart disease) or procedure (such as cataract) covered in the system. The DRG system is “exhaustive,” in that it groups all diseases and sets rates for groups according to diagnosis, cost, and severity. In the case-payment method in China, only one disease category or a few diseases are selected, and rates for selected diseases are set within maximum limits or according to fixed rates, and not as averages as with DRGs. Diseases outside the case-based payment system are still charged with an FFS method.

This review focuses on the case-based payment system and the government budget allocation method and analyses the impacts of reforms on cost containment, utilization, and quality of health care.

### 3. Case-Based Payment Systems

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In August 2004, the Ministry of Health (MOH) issued a policy document, “To Carry Out Experiments in the Use of Case-based Payment Systems” (General Office of MOH 2004). Tianjin, Liaoning, Heilongjiang, Shandong, Henan, Shaanxi, and Qinghai were selected to pilot this payment method. This experiment was organized by the provincial department of health, and targeted individual public hospitals as pilots. Since then, those provinces have used case-based payments in more hospitals than the payment experiments before 2004. NCMS and BMI have also adopted case-based payment methods in some areas.

In 2007, 4,198 hospitals used case-based payment systems, accounting for 22 percent of all hospitals (DHFP of MOH 2007). Table 1 summarizes the characteristics of case-based payment reforms, and some examples are presented in the following sections. Even if the initiators are different, the experiments are similar.

**Table 1. Characteristics of Case-Based Payment Systems**

	<b>Characteristics</b>	<b>Examples</b>
<b>Initiator</b>	Government	At least seven provinces including Henan, Shandong, Heilongjiang
	Hospitals	Many individual hospitals including Jining, Mudnajiag, Wen county
	NCMS	Many NCMS pilot counties including Zheng’an, Qiang Jinag, Liaocheng
	BMI	Few BMI schemes including Beijing, Changsha, Shandong
<b>Number of diseases</b>	5 to 716	In general, the number of diseases covered by the case-based payment programs is fewer in BMI and NCMS than that organized by individual hospitals.
<b>Method for setting prices</b>	Average actual medical expenditure over the past years	Most case-based payment programs
	Standard protocol	Few places including Jining and Shanghai
	Average medical expenditure over the past years and then reducing by some percentage	Few places, for example, Yinchuan and Zheng’an

Table 1, continued

<b>Nature of the prices</b>	Fixed prices	Most of the case-based payment experiment places
	Maximum price	Some places including Jining and Qianjiang
<b>Exceptions</b>	Severity of the diseases, characteristics of the patients	All places in this review
<b>Quality assurance measures</b>	Selection of contract providers	NCMS and BMI schemes in selecting health providers according to standards in medical personnel and equipment
	Regular monitoring	NCMS and BMI schemes in examining the provision of health care and patients' satisfaction
	Development of standard protocol	Few places, for example, Jining
<b>Incentives</b>	Allocation of the surplus	For surplus making from charges below the maximum rates, it is kept by the hospitals, for example, Jining and Qianjiang

Source: Authors.

## Case-based payment reform managed by hospitals

### *Overview of hospital-managed case-based payment system*

Case-based payment reforms managed by hospitals are mainly initiated by the Department of Health (DOH) at the provincial or municipal level and by the hospitals themselves. In the former, the aim is to control costs and increase public satisfaction. In the pilot provinces mentioned above, most provincial health departments issued policies encouraging hospitals to implement case-based payment reforms. In Henan, the DOH selected 30 diseases in 2006 and 70 diseases in 2007 for hospitals to implement case-based payments (Dong 2007). Three pilot hospitals in Henan were selected in 2006 and 39 were added in 2007. In most cases initiated by the DOH, generic guidelines were used rather than concrete instructions for setting prices, selecting diseases, and evaluating programs.

Most case-based payment reforms are initiated by hospitals, primarily to attract more patients by capping their out-of-pocket costs (Du et al. 2007). Other purposes include responding to public pressure on hospitals and improving hospital management.

Setting rates in case-based payment is crucial in implementation, because this determines incentives for both providers and users. Most hospitals set rates by averaging past medical expenditures, as was done in Mudanjiang, Liaocheng, and Qinhai (Du et al. 2007). Some

hospitals discount past medical expenditures, as in Yinchuang.<sup>2</sup> A few hospitals base prices on standard protocols of treatments, as at Jining Medical College Hospital (Wu et al. 2007a).

The number of diseases paid using case-based payments ranged from 5 to 716 diseases. With reasonable fee levels, covering more diseases leads to greater cost control. As mentioned above, the diseases covered by case-based payments are single diseases using ICD9 or ICD10 classification systems. In many case-based payment programs, diseases with relatively clear diagnoses, such as surgical cases, are often selected.

Implementing the case-based payment system may deviate from current prices of the department of price administration, which sets prices based on fee items and sets the price of a case by adding the fee items together. In this situation, fee schedules set by the government may not be strictly followed (Du et al. 2007).

Among hospitals which have implemented case-based payment methods, Jining Medical College Hospital is recognized for its good practice, and has been praised by the central government and followed by other hospitals, mainly because it has received positive feedback from patients for reducing medical expenditures and improving case management.

A common problem in case-based payment, including NCMS and BMI, is the limited number of diseases covered. The effect of case-based payment on cost containment is limited if too few diseases are covered. Billing departments can “game” payers by coding cases that are profitable and billing outside the cases when costs run over maximum limits.

### ***Case-based payment system in Jining***

The case-based payment system in Jining has recently been modified and improved. The number of diseases covered increased from 67 to 128 (Jining Hospital 2007). The objectives of case-based payments are to: (1) control unreasonable medical expenditures; (2) improve health care quality; (3) improve financial management systems; and (4) encourage the hospital to treat patients with more complicated conditions.

The selection of diseases was based on three factors: number of admissions, proportion of expenditures on the diseases, and diagnosis. Diseases with frequent utilization, high medical expenditure, and easy diagnosis were selected. All the selected diseases have a clear diagnosis with ICD10. The hospital organizes medical experts to standardize treatment protocols for diseases using the new payment system. For each disease, a minimum standard of effective treatment was developed. Key elements in the protocol included hospital length of stay, use of drugs, service items used, and surgical operation approaches. Based on the protocol, medical treatment costs were calculated for each disease.

After developing treatment protocols, standard nursing care services were developed by nursing experts. Treatment and nursing care protocols are the major care provided to patients. Prices for each disease covered by the system are based on protocol costs.

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<sup>2</sup> Informal interview with Mr. Ma at Yinchuan Health Bureau.

Because antibiotics have often been unnecessarily utilized, the hospital issued specific policies for reducing antibiotic use. Information on fees, provision of health care, and other major treatment elements are provided to patients, and an agreement is signed if the patient agrees to use the protocol for treatment at a certain fee.

The hospital has organized monitoring and evaluation of the payment system. Length of stay, use of drugs, treatment efficacy, medical care expenditures, and patient satisfaction are major indicators of the evaluation, and some indicators are linked with quality assurance.

Liu and his colleagues reviewed the operation of case-based payments in Jining (Liu et al. 2007). Several conditions were identified as critical for implementing the system, including (1) capable hospital administration team; (2) effective incentive mechanism; (3) functioning information system; and (4) sound financial management.

Dr. Wu Guanghua, Director of Jining Hospital, stressed the importance of personnel policy in implementing case-based payments. He indicated that adopting this payment system would affect some health staff because reduced use of drugs will decrease incomes for individual health workers and clinical departments. Some workers, including heads of clinical departments, opposed this system because of its impact on revenues and incomes. Facing difficulties in implementing this new payment method, the hospital administration introduced competition in selecting heads of departments. Heads of clinical departments who cannot follow case-based payment methods, including reducing drug use and assuring health care quality, would be replaced. This has been effective, especially in recent years when more health workers have realized the benefits of the case-based payment system.

### **Case-based payment systems organized by NCMS management**

From the beginning of NCMS, case-based payments have been adopted in some counties (Meng 2005). However, most reports on those payment experiments were from the county NCMS management office, and lacked external evaluation. Case-based payment systems in NCMS schemes vary greatly, and a UNICEF study found that some NCMS counties were called case-based, but their payment methods were not effectively implemented in terms of disease selection, price setting, and evaluation (Zhou et al. 2007). Two NCMS pilot counties, Zheng'an in Shaanxi Province and Qianjiang in Chongqing, were assessed by external study teams.

### ***The Zheng'an NCMS payment system***

Yao 2007a and Chen Y et al. 2007 reported that Zheng'an was among the earliest counties to pilot a case-based payment system when NCMS began in 2003, and the management office selected 38 diseases for this system. Diseases were selected according to hospitalization rate, and accounted for 79 percent of hospital admissions and 70 percent of expenditures on inpatient care. The number of diseases covered increased to 54 in 2004.

The price of each disease covered in the new system was fixed. NCMS pays the fixed rate to hospitals regardless of actual expenditure, and NCMS beneficiaries pay a fixed cost. For example, the rate for acute appendicitis is 1,200 CNY per case, a patient covered by NCMS pays 50 percent (600 CNY), and 600 CNY is paid by NCMS. If actual expenditure is less than the fixed rate, hospitals keep the difference. Otherwise, hospitals bear the excess cost.

Prices of diseases covered by case-based payments were set using following formula:

$$\text{Price of disease} = [(total\ expenditure\ on\ disease - unreasonable\ expenditures + leakage\ cost) \times inflation\ rate] / number\ of\ inpatients\ for\ disease$$

*Unreasonable expenditures* are assessed by experts using a percentage of total expenditure in accounting for unnecessary expenditures on drugs and technologies. The *leakage cost* is calculated by NCMS management because township health centers may not charge actual costs in order to attract patients.

For patients with complicated conditions, hospitals are paid with FFS payments. With an agreement between hospitals and health care users, medical expenditures are calculated according to the fee schedule, and hospitals bear no financial risk. They are reimbursed by NCMS and patients for actual expenditures. Patients receive NCMS reimbursement of a percentage of total expenditures according to the level of expenditures incurred.

NCMS has adopted several measures for quality assurance, including requiring essential equipment and drugs for the insured, regular monitoring to check appropriate drug use, and responses about quality of care from users.

### ***The Qianjiang NCMS payment system***

From the beginning of NCMS in Qianjiang of Chongqing, the case-based method was adopted to pay contract hospitals (Yao 2007a; Luo et al. 2007). Qianjiang sets maximum limits rather than rates for 458 diseases, and contracted hospitals must charge fees below the maximum. If actual expenditures exceed the limit and cannot be explained, hospitals must bear the overrun.

Price limits are set by an expert panel from county and township hospitals, and are based on average inpatient expenditures during the past three years. When a price limit is

calculated, adjustments are made for hospital levels and health conditions. Fee rates for township hospitals are 20 percent below the limits, and fee rates for county hospitals are 15 percent above the limits. Limits for patients with complicated conditions are 20 percent higher than average limits.

Expenditures on diseases covered by the new payment system are reimbursed by NCMS at certain percentages of actual expenditures, if expenditures do not exceed the limits. NCMS beneficiaries are reimbursed at 50 percent of the expenditures in township health centers and 40 percent in county hospitals.

Besides introducing price limits for diseases, Qianjiang has adopted global budgets for inpatient care in contracted hospitals. This supplements case-based payments in order to control total NCMS expenditures. Contract health providers must control not only expenditures on diseases covered by case-based payments, but also expenditures on diseases outside the payment system.

The Qianjiang NCMS management office calculates the NCMS fund that can be used by each contract hospital, based on NCMS funds available for inpatient care and health care utilization. At the beginning of a year, NCMS management allocates funds to each hospital. Surplus NCMS funds can remain with a hospital to use the following year, and any deficit of NCMS funds is absorbed by the hospital and the government. For example, township health centers and township government absorb the deficit if NCMS expenditures exceed the budget allocated to those health centers.

### **Case-based payment systems organized by BMI fund management**

Case-based payments have been used by the BMI departments of labor and social security since 2004. The Beijing BMI scheme began implementing case-based payments for five diseases in early 2007 (Xinhua Net 2007). In Changsha in Hunan Province, the BMI management agency selected 19 diseases for case-based payments in four pilot hospitals in 2002 (Xinhua Net 2006). The Shanghai Bureau of Medical Insurance started to pilot case-based payments in late 2004 by selecting 9 diseases and 22 hospitals (Xu et al. 2006). The Shandong Provincial Department of Labor and Social Security introduced case-based payments in mid-2005 (Qinlu Daily 2005). In this reform, 61 diseases were recommended to municipal departments of labor and social security for case-based payments.

Cost containment is the primary purpose for BMI case-based payment reforms in the schemes mentioned above, and there is little evidence of its use to assure health care quality. Case-based payment reforms have not included measures for coordinating with departments of health. In Shandong Province, fee rates for diseases are made according to standard treatment protocols developed by the health sector, but there is no widely accepted standard treatment protocol from health departments, and fee rates for diseases in case-based payment systems are usually determined by averaging actual past expenditures. The

approach of using historic costs (and not normative protocols) is similar to many OECD countries including the United States (see below).

In the BMI case-based payment experiments, payments are made according to pre-set conditions. In Shandong, payments are made according to actual expenditures, health conditions, and use of inpatient care (Qilu Daily 2005). The BMI pays hospitals the actual expenditures if spending is below 80 percent of pre-set rates. For complicated cases, the first diagnosis is used for payment. To guard against readmissions, if an insured patient is hospitalized by the same hospital within 15 days after discharge, the hospital must cover all expenditures for the second hospitalization.

### **Impact of case-based payment reform**

Case-based payments can be expected to contain costs, but may lead to concern about quality of care. Case-based payments can be gamed by health providers by reducing the length of stay, increasing readmissions, admitting outpatients who do not need to be hospitalized, and treating patients inappropriately. These behaviors all lead to inefficient resource use and poor quality care.

There is evidence of a positive impact of case-based payments on cost containment. In Jining Medical College Hospital, expenditures on the 128 diseases covered by case-based payments decreased by 33 percent (Wu et al. 2007b), and for catastrophic diseases there were greater reductions in medical expenditures. Expenditures for heart surgery decreased from 17,580 CNY before the case-based system to 10,000 CNY after this reform. Reduced drug expenditure was the major source of change. After implementing case-based payments, drug revenues from covered diseases were less than 12 percent of total revenues. Liang and colleagues found that case-based payments using standard treatment protocols could reduce hospital length of stay and medical expenditures (Liang et al. 2004). In the current FFS environment, standard protocols may be critical for these new payment systems to be effective (Chen et al. 2006).

To assess the impact of NCMS payment reform in Qianjiang, acute appendicitis was used as a tracer. Expenditure per case of appendicitis decreased in both township and county hospitals, mainly attributable to decreased drug expenditures (Luo et al. 2007). However, the reduction in costs may result from the global budget method rather than from limits on prices for treating diseases, consistent with evidence from OECD countries (Langenbrunner et al. 2005).

In Zheng'an, the NCMS case-based payment system reduced costs (Chen et al. 2007; Yao 2007a). After implementing case-based payments, expenditures on covered diseases remained the same as before the reform, but expenditures on diseases not covered by the system increased. Chen et al. (2007) indicated that over time it would become difficult to

control medical expenditures in Zheng'an, because too many diseases with complicated conditions are considered and those diseases are reimbursed using FFS (Chen et al. 2007).

Xu and others examined the impact of BMI case-based payments on medical expenditures in Shanghai (Xu et al. 2006). After the reform, medical expenditures on five diseases covered by this system significantly decreased, and expenditures on three other diseases had no significant change. Chi found that case-based payments are more effective in containing costs than other methods in three cities (Chi et al. 2004).

Because of the exceptions to the case-based system, any assessment of its effectiveness in containing costs must examine overall medical expenditures. Reducing medical expenditures on covered diseases will not reduce expenditures for all diseases, because costs of covered diseases can be shifted to diseases outside the payment system. In Zheng'an, medical expenditures on diseases outside the payment system increased rapidly. Even if rigorous studies of cost-shifting behavior are not available, a case-based payment system with few diseases would not have a significant impact on overall medical expenditures.

Health care improved in the Jining Medical College Hospital after implementing case-based payments (Wu et al. 2007b) as a result of using standard treatment and nursing protocols. About 98 percent of inpatients treated were satisfied with drug prescriptions, and 93 percent were satisfied with the charges. In Lindian county in Heilongjiang province, the NCMS case-based payment reform had a positive effect on health care quality (Zhang et al. 2005), but there was no specific evidence to support this finding.

Compared with FFS, one concern with case-based payments is the reduced use of resources in treating covered diseases. Even if NCMS and BMI monitor and investigate patients' satisfaction, it is not certain that quality will improve, because the information asymmetry across health providers, regulators, payers, and patients may still lead to inconsistent incentives among these groups. More scientific work is needed.

Only one study, on the Jining payment reform, links case-based payment reform and change in use (Wu et al. 2007b). The number of patients increased by 144 percent from 2004 to 2006, reaching 5,163 hospitalized patients that were 14 percent of admissions. Hospital admissions increased as a result of transparent prices of diseases and relatively low prices compared with other hospitals. Total revenues increased, suggesting that reforms may not lead to financial losses if lower prices attract patients to use hospital services.

## 4. Alternative Government Budget Payment Methods

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### Overview of government budget payment reforms

Government supply-side financing for health has increased, especially for primary health care providers including urban community health centers/stations, rural township health centers, and village clinics. One goal of government finance is to provide incentives for primary health providers to deliver public health care and basic curative care.

The traditional allocation of government funds to health facilities is input-based or “heads-based,” where the number of staff in a facility determines the allocation. As noted above, this can encourage facilities to increase staff rather than improve productivity.

During the past five years, many reforms in government health budgets have been implemented, especially in urban cities. As with other reforms, the key is to improve the performance of health providers, including quality, health care utilization, cost, and public satisfaction. This is often termed “Pay-for-Performance” or P4P. “Separating Revenue and Expenditure Accounting System” (SRE) has been popular recently. In this reform, revenues generated from user charges are handed to the government finance authority, pooled with budget funds, and allocated with the government health budget; the funds returned from the finance authority to health providers are determined by an assessment or a fixed percentage. This reform has been tried in Shanghai, Tianjin, Yinchuan, Chengdu, and Xining (Yu 2007; Yao 2007b; Meng et al. 2007).

### SRE for rural primary health providers

In 2006, the Ningxia government began using SRE for rural township health centers (Yu 2007). The government health budget covers the salaries of health staff, revenues from user charges are handed over to the county finance department, and the county finance department returns 60 percent of the revenues each month. To reduce drug expenditures, all drugs are purchased by a government group purchasing agency, and the health centers sell drugs by adding 5 percent to the price for transportation and storage costs, not the 15 percent that was previously added. The government also purchases medical equipment for the centers. Although elements of this pilot were adapted for the national health reform plan, performance indicators used to pay health centers are not developed.

## SRE for urban community health centers

In mid-2005, the MoH began piloting SRE in Hangzhou, Shanghai, Chengdu, and Changchun (Yao 2007b), where the government leads in financing community health centers. Government budgets cover staff salaries and operations, revenues from user charges are handed to the department of finance, and community health centers are not allowed to profit from drug prescriptions (“zero-profit-drug prescription”).

Many cities, including cities in this pilot, have adopted a population-and-performance based method for allocating government budgets to community health centers (Yu 2007). Changning district in Shanghai is a typical example (Yao 2007b; Yu 2007).

Changning allocated government funds according to population covered and CHC performance. Allocation was set by estimated cost of primary health care. In 2006, 500,000 CNY per 10,000 population was allocated to CHCs for a package of services, including infectious disease control, managing non-communicable chronic diseases, maternal and child health, occupational health, mental health, clean water, and health education. Payments to community health workers have two parts: basic salary and performance-based salary, with the performance salary determined by the quantity and quality of health care provided.

Tianjin allocates 10 CNY per person a year to community health centers (Yu 2007), and the municipal health bureau defined a package of essential health care including 18 categories of services similar to those in Changning. Community health centers are paid according to performance, with evaluations organized twice a year by the health sector, finance department, and community. Actual payments are based on evaluated performance.

## Impact of the SRE experiment

Impact studies of SRE are limited because of its short period of implementation, but SRE has likely had a positive impact on medical cost, behavior of health workers, health care utilization, and public satisfaction. Yao et al. reported positive impacts (Yao 2007b):

- **Cost containment.** Cost per outpatient service decreased more rapidly in SRE pilot community health centers than in non-pilot ones. In Wuhou district in Chengdu, cost per outpatient service decreased by 20-29 percent in pilot centers and by 10 percent in non-pilot centers. In Changning district in Shanghai, cost per outpatient service declined by 38 percent between 2005 and 2006 in SRE pilot centers and by only 4 percent in non-pilot centers.
- **Health care utilization.** SRE reform increased the utilization of community health centers. In Changning (Shanghai) outpatient services increased by 16.7 percent in 2006 compared with 2005. In Xiacheng (Hangzhou), outpatient health care utilization increased by 9.1 percent in community health centers and only 2.3 percent in controlled health centers. However, when the increased utilization and the SRE pilot were linked, the studies did not provide adequate explanations.

- Increased health care use could result from reduced costs and improved quality perceived by the community population, as well as induced by the health providers.
- ***Drug prescription behavior.*** SRE may encourage doctors to reduce unnecessary drug prescriptions. Use of antibiotics decreased after SRE was implemented. This was attributed to the “zero-profit-drug” policy in the SRE system and the increased government budget for community health centers. Health providers have less incentive to prescribe drugs when it is not tied to revenue generation.
  - ***Public satisfaction.*** After SRE was implemented, public satisfaction improved. More comprehensive services available at the centers and more time taken by health workers in serving the people were the key elements of improvement. Other aspects of healthcare quality were not evaluated in the available studies.
  - ***Financial sustainability.*** In Ningxia, financial sustainability of township health centers was negatively affected by the SRE reform (Yu 2007). First, the government budget allocation for health staff salaries was based on number of permanent health workers. Because many township health centers hired temporary health workers, the salaries of those workers were not covered. Second, the “zero-profit-drug system” without adequate compensation from the government budget pushed the centers into financial difficulties, because 80 percent of the revenues of township health centers came from drug sales. Third, the government promised to return 60 percent of the revenues the health centers handed over, but the return of funds to health centers was not on time.

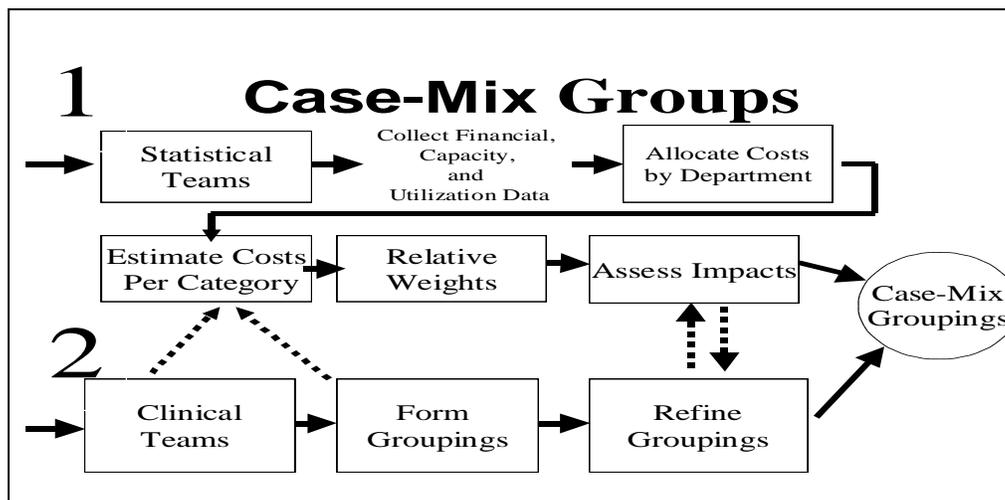
Elements of these pilots have been integrated into the national reform plan announced in 2009.

## 5. The Way Forward for China?

Both the Ministry of Health (MOH) and the Ministry of Human Resources and Social Security (MOHRSS) have been trying to adopt alternative methods for paying health providers through fund allocations from NCMS, BMI, and the government health budget. New payment systems can contain costs and improve public satisfaction, which are priorities for individuals and the government. The government will continue to encourage new approaches under health reform. Many hospitals adopted case-based payment systems, probably based on their interest in generating revenues by attracting more patients.

The popularity of case-based payment systems can be explained along three dimensions. First, case-based payment can be more easily designed, developed, and managed than DRGs. Organizers can select a few diseases for case-based payment systems, but it is complicated to classify all diseases in an “exhaustive” set of groups for payment in DRGs. Individual hospitals can implement case-based payments with selected diseases, but the DRG system usually needs effort from a third party, either government agencies or insurers, because of the data requirements for up to several hundred thousand cases. The DRGs will require both NCMS and BMI to do data collection, analysis, and refinement on an ongoing basis. A schematic of DRG development is provided in Figure 1 below.

**Figure 1: Developing DRG Groupings**



Source: Langenbrunner (2005).

Second, hospital information systems must be further developed before DRG can be fully implemented. Rural NCMS data systems have improved significantly, but still lack adequate coding space and coded data of diagnosis categories. In most rural counties, only one diagnosis can be coded, whereas the international experience (see below) suggests that at

least three to five categories are needed to include complications and co-morbidities. Case-based payment systems need less advanced and comprehensive information systems than DRG systems in disease coding, cost analysis, and reporting.

The current financing mechanism does not include DRGs on a widespread basis, nor other mechanisms such as capitation, global budget, or other payment methods. Health insurance schemes have expanded rapidly in recent years, but user fees paid by FFS are still the dominant source of finance for outpatient and hospital care. The first steps have been case-based payment with the inclusion of single diseases which makes it possible to begin to contain costs for both individual patients and third parties. On the outpatient side, the new adoption of SRE (and more recently capitation) suggests that the health sector may be getting closer to using more incentive-based payment systems by third-party payers.

### **What works and what does not: The need for evidence**

Even if case-based payments have been widely used, outcomes from these experiments have not been systematically evaluated. A few studies suggest that case-based payment systems help control medical expenditures, reduce spending on drugs and increase health care utilization, but none has a rigorous design. Many factors can lead to changes in cost, quality, and utilization of health care, and it is not easy to examine the net effect of payment reform. For example, the Jining model would not have positive effects if supplementary measures including personnel policy were not implemented. The evaluation studies do not distinguish the importance of the payment system and personnel policy. If personnel policy takes the leading role in reducing medical expenditures, what is the relative effect of payment reform? Can hospitals achieve the same outcome with FFS if personnel policy and management improve? An understanding of the variables affecting the impacts of payment systems is needed to achieve expected outcomes.

First, to remove incentives for hospitals to rely on drug prescriptions and high technologies, government financial policy for public hospitals is being reformed. Second, hospital management capacity, including information systems, is being strengthened to adopt new payment systems. Third, supplementary measures including personnel policy as found in Jining hospital and self-regulation by hospitals will need to be piloted and implemented. Finally, an effective monitoring mechanism needs to be established to evaluate hospital performance in terms of cost containment and quality improvement.

Among the case-based payment experiments, Jining hospital and Qianjiang NCMS show some success. Experiences from these examples include (1) implementing supplementary measures to support payment reform, such as personnel policy reform and developing standard treatment protocols; (2) including diseases in the new payment system that provide a nearly “exhaustive” set of payment categories; and (3) adopting “mixed” or “blended” payment methods and focusing on key components of medical costs. For example,

Qianjiang's NCMS uses global budget control in addition to implementing case-based payments. Jining hospital pays great attention to reducing drug expenditures.

Case-based payments have not worked in places where only a few diseases were covered and no other efforts were made to support the new payment system. Weak management and information systems also affect implementation of case-based payment experiments.

## 6. International Experience

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### Payment methods: Typology and historic use

A simple typology for thinking about reimbursement mechanisms for health care institutions and workers relates to whether payment is time-based, service-based, or population-based. With time-based payment, providers are paid according to time spent providing the service irrespective of the number served. In service-based remuneration, payment depends on the number of services provided or patients treated. Population-based remuneration is payment according to the size of population served by the facility irrespective of the number of patients actually attending. Most types of payment can be categorized in one of these groups (Table 2).

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**Table 2: A Typology of Provider Payments<sup>3</sup>**

<b>Time-based</b>	Salary	Fixed budget (based usually on historic allocations)
<b>Service-based</b>	Fee for service	Fee for service
	Fee for patient episode (e.g., admission)	Fee per hospital day ("per diem") Fee for patient episode
	Target payments	Budget based on case-mix/utilization
<b>Population-based</b>	Per capita payment	Block contract
	Territorial payment	

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**Source:** Ensor and Langenbrunner, 2000.

Historically, in Europe, provider remuneration has been time and population-based. In countries in Western Europe such as the UK, and in countries of the Eastern bloc and Soviet Union countries prior to 1990s, most staff were paid a time-based salary that was fixed irrespective of the level of work or size of the population catchment area.

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<sup>3</sup> For some observers, "time-based" may be a catch-all for "budgets" and may not be useful as a conceptual framework. Nearly all payment methods are time-based in the sense that there are time limits. There is overlap between time-based and population-based methods in the table as well. Other observers prefer the distinction of "retrospective" and "prospective" payments, indicating payment made by the purchaser after or before the delivery of services.

Time-based payments were typically based on input characteristics such as past qualifications and years of experience for individual providers and beds and staff for facilities.

The input-based approach allows no flexibility to respond to local needs or changes in technology or treatment patterns. Basic population norms encouraged a certain degree of input-dominated equity, but the actual distribution was influenced both by the initial distribution of facilities and political, social, and economic factors. Areas that generated more revenue had greater influence over their share than those with lower revenues.

## **Contracts and provider payments**

Contracts are often used with new provider payment systems. Payment systems address the facility; contracts help address workers (individual providers) within the facility more directly. This is especially important for the public sector delivery system. Contracts are still relatively underused in China, but are gaining interest with the advent of performance-based pay (P4P) approaches. To give an example of its potential, each government employee might be issued a written performance employment contract covering the main terms and conditions of service. The international experience with performance contracts is that employment is often guaranteed in the first year or two, but not beyond. Appropriate training is needed for key individuals to write and understand employment contracts. A health workers' "Performance Management Scheme" could be designed and implemented to ensure that job descriptions, grading, and remuneration are linked to objective, measurable targets. The Performance Management Scheme could recognize both national imperatives and local objectives to ensure that every health worker strives to achieve corporate health sector aims and objectives, to be motivated by the work, to develop to meet health service needs, and to deliver quality service to patients. Some measures of performance are given in Box 1 below, and the international experience of P4P is expanded later in this section.

### **Box 1. Linking Pay with Performance: Selected Measures**

- *Measures of effective management of chronic cases:* Percentage of diabetics with controlled lipid levels (LDL levels less than 130mg/dL)
- *Measures of hospital quality:* Infection rates
- *Measures of health education:* Percentage of enrolled smokers who participate in smoking cessation workshops
- *Measures to control excessive utilization:* Percentage of prescriptions that are generic

## Experience with contracts in Europe

Contracts are widely used in Europe. In Austria, the public civil service was abolished and contracts were given to workers. Existing employees were not affected, but for new employees contracts are given for fixed periods, and pay scales are flexible and negotiated similar to market-based enterprises and firms.

In the mid-1990s, some Western European countries introduced merit- and market-related pay. Merit-related pay is connected to devolving responsibilities to local managers. One approach was to provide bonuses and special supplements were often added to salaries. Special bonuses and pay supplements have been used in Sweden to implement small wage differentials and overcome rigidities in public sector pay that can result in staff shortages. Bonuses have also been used in the public hospital system in France to boost the salary levels of specific health occupations without the risk that other occupations might also have to be classified at similar levels. Some of these bonuses do not appear in official statistics.

Western Europe has also linked levels of salary and remuneration to targets or “benchmarks” such as those in Box 1 above. Targets can be established over time and used to compare providers. These targets or benchmarks can improve customer satisfaction, promote teamwork and cross-functional learning, and provide the basis for continuous quality improvement.

In the United Kingdom, the Conservative government introduced merit pay for senior and middle managers in the 1980s. Sweden and Germany have also shown an interest in merit pay. However, its use has not been widespread because of difficulties in establishing objective measurement criteria and hesitations about using such an instrument in the health sector. Moreover, the results of the experience in the United Kingdom are widely questioned. Above all, there is not good evidence that merit pay creates motivation in public services. According to an ILO report in the late 1990s, on the contrary, the lack of objective performance appraisal and measurable output indicators can result in merit pay being a de-motivator, especially for those at the bottom of the performance scales (however measured). It is even said to reinforce existing gender bias. Particularly criticized in the United Kingdom is the inability of such pay systems to reward team performance and corporate success. In Denmark, such bonuses may be awarded to individuals or to a team. For achievement-related bonuses, team rewards appear to be more likely.

In many countries, increasing attention is paid to non-financial benefits that include terms of employment, working conditions, and employment security. The Canadian Nurses Association noted that nurses attached high value to “non-financial payment” such as vacation time, free legal advice, and child and elderly care. Employment security is now a higher concern than remuneration.

## **Contracting out**

A second tool related to benchmarking in the public sector is the “contracting out” to the private sector of certain services. In Eastern Europe, public providers in Poland, Romania, and other countries contract out some responsibilities in the delivery (not the financing) of services such as laundry, food, and diagnostic services. In Romania, hospitals contract with private labs and diagnostic centers for all services, and close their own services. Private providers, through volume and competition, provide services for less cost. Contracting out requires caution, as well as:

- A competitive environment;
- Well-defined services;
- Coordination with public sector activities;
- Assessment of quality of private management;
- Specification of service standards; and
- Close monitoring of contract performance.

This approach has been piloted in larger cities in China and is outlined in more detail in *Fixing the Public Hospital System in China* (China Health Policy Note, Number 2).

## **Paying for services not workers**

Many countries have moved away from input-based budgets and salaries for providers. With a new purchaser-provider split for insurance (as in China now) employees of insurance schemes are taken out of civil service, as in Estonia. Employees may be protected by employment laws, but they then contract with facilities, not the government. Facilities typically have some flexibility to hire new employees and terminate unneeded staff. The system of payment is then re-oriented towards services or activities, as measured by outputs or even outcomes. This is reinforced by the experience in the 1980s of health insurance systems in Western Europe and North America that were developing or using service-based systems of payment. Today, sophisticated purchasers link payment with service performance, service outputs, and ultimately, patient health outcomes (although the latter is still not employed much). They may also couple these “performance-based” mechanisms with demand-side mechanisms such as co-payments or deductibles.

Service-based approaches can be categorized by unit of service, and payment is typically made by purchasers on a retrospective basis (after the service is rendered). “Fee-for-service” (FFS) as used in China pays for basic units of services to individual providers, such as office visits, x-rays, or laboratory services. The level of remuneration under FFS can be determined retrospectively or prospectively (as in Canada and in Japan). Popular with providers in any country, traditional FFS is an open-ended fee charged by doctors according to the market. The experience in industrial countries, and increasingly elsewhere, is that FFS correlates with a great increase in volume and overall unchecked

increases in health expenditures. One short-term response to expenditure growth in other countries under fee-for-service has been to cap overall spending on the supply side, and to encourage patient cost sharing to minimize moral hazard. One variant, the negotiated fee schedule as in Japan, allows purchasers to negotiate with providers or provider associations on standard charges for items of service. Japan caps overall payout under FFS by the government and limits consumer out-of-pocket costs as well.

For facilities, per day (“per diem”) payment is often the first basic unit of payment beyond FFS that purchasers use. Like FFS, per diem methods are administratively straightforward but can encourage increases in volumes (overproduction) of services. Per diem is being piloted in Lu Feng county in Yunnan Province with some success.

As described earlier in this paper, during the last two decades, new and more sophisticated payment systems have evolved with units of payment becoming broader, and prices for these “bundles” of services set mostly on a prospective basis. Purchasers have adopted fixed-price payments for defined products that mimic entire clinical episodes, such as an ambulatory surgery, and more often, for inpatient stays. Fixed-price payments, if administered correctly, control costs and improve internal efficiency. This approach removes economic incentives for hospitals to over-provide services. Diagnosis-Related Groups (DRGs) are the best example of these mechanisms. The DRG system was first introduced in the US in 1983 by the Medicare system. Originally, DRGs were implemented as a management tool in addition to a reimbursement method. With its effectiveness in lowering costs and improving efficiency, many countries have adopted some form of DRG payment system but with modifications to counteract the negative impact of DRGs. Perverse incentives associated with DRGs include risk selection, “up-coding” patients to more costly groups, providing more intensive treatment to shift patients to higher cost categories, and the lack of motivation to improve quality.

There are also examples of prospective budget-setting related to service outputs. Global budgets fix price as well as volume for inpatient services or outpatient services. In some EU countries, the size of budgets is related to information on case mix, cost, and expected volume. Some countries also use capitation payments that provide a fixed amount per capita for a mix of services over a defined period of time (such as one year). Hence, even prospectively-oriented methods can be related to data from earlier periods on service mix and cost. As unit of service becomes broader, providers have greater incentives to limit overprovision of services under fee-for-service, and have an incentive to provide cost-effective care including preventive services. Providers are motivated to innovate in cost-reducing technology, use lower cost alternative treatment settings, and deliver cost-effective care. At the same time, providers have an incentive to reduce necessary care. Providers may select low-risk clients and cut quality of care to reduce their cost and risk.

Finally, if referrals are outside the unit of service, a patient is more likely to be sent to a specialist or a hospital even if the referral is not necessary.

Payment systems allow contracting with the facilities, and allow facilities to contract in turn with employees. There may be general rules of labor protection and salaries may be determined through collective bargaining. Which payment system a purchaser chooses will depend upon incentives and links with overall policy objectives and ease of implementation. Payment systems, coupled with the new autonomy of facilities in China, may have a more significant impact on behavior and performance than modified pay scales. Table 3 summarizes payment methods and the incentives for provider behavior.<sup>4</sup> Optimal payment systems for providers should induce providers to perform high quality, effective treatments, while at the same time promoting a rational allocation of health sector resources.

**Table 3. Provider Payment Methods and Incentives for Provider Behavior**

Mechanisms	Incentives for Provider Behavior		
	Prevention	Delivery and production of services	Cost containment
Line Item Budget	+ / -	-	+ + +
Fee-for-Service (FFS)	+ / -	+ + +	- - -
Per Diem	+ / -	+ + +	- - -
Per Case (e.g., DRGs)	+ / -	+ +	+ +
Global Budget	+ +	- -	+ + +
Capitation	+ + +	- -	+ + +

Source: Langenbrunner et al. 2005.

## Developments in Europe

As with other OECD countries, payment systems in Western Europe have been used to contain costs as well as redistribute increasing shares of expenditures to less expensive primary and outpatient care. Tables 4 presents an overview of approaches to physician payment in selected countries.

<sup>4</sup> This table provides indicative impacts for “pure systems.” However, it should be noted that most systems use a blended or “mixed” model of different mechanisms and hence incentives, yielding somewhat unique results.

**Table 4. Payment of Physicians in Europe**

	<b>Salary</b>	<b>Capitation</b>	<b>Fee-for-Service</b>	<b>Combination</b>
<b>Northern "NHS"-model/Tax-Based Health Systems</b>				
Denmark				X (capitation + FFS)
England	X (hospital-based)	X (public)	X (private)	
Finland	X			
Ireland	X (hospital consultants in public practice)	X (public patients)	X (private patients)	
Norway			X	
Sweden	X (public)		X (private)	
<b>Southern "NHS"-model /Tax-based health systems</b>				
Italy		X		
Portugal	X			
Spain				X (salary + capitation)
<b>Social health insurance-based health systems</b>				
Austria				X (flat rate + FFS)
Belgium			X (private)	
France			X	
Germany			X (free practicing)	

**Source :** Langenbrunner et al. 2005.

Table 5 presents an overview of methods of hospital payment in several Western Europe countries. A comparison of respective physician and hospital payment methods is discussed in the sections below.

**Table 5. Payment of Hospitals in Europe**

Line Item	Per case	Global budget	Combination global budget with DRGs/Case-mix adjuster
<b>Northern "NHS"-model/Tax-Based Health Systems</b>			
Denmark	X	X	
England			X
Finland	X		
Ireland			X
Norway			X
Sweden			X
<b>Southern "NHS"-model/Tax-Based Health Systems</b>			
Italy			X
Portugal			X
Spain			X
<b>Social Insurance-Based Health Systems</b>			
Austria			X
Belgium			X
France			X
Germany			X

*Source:* Langenbrunner et al. 2005.

## Physician services

Three models have dominated physician services historically: salary, capitation, and fee-for-service, or some combination. In general, physicians in private practice are paid on a fee-for-service basis while salary or capitation or some combination tend to dominate as payment methods for service provision in the public sector though countries like France and Germany also pay on a fee-for-service basis for all patients.

In Germany, ambulatory care physicians are reimbursed retrospectively per service provided. Two national fee schedules determine the prices paid. The first, for the private sector, is determined annually at the national level and sets the price per service in currency units.<sup>5</sup> The second applies to payments to physicians by sickness funds, the publicly financed insurers that cover most of the population. Each service is given a relative value

<sup>5</sup> The private sector serves mainly individuals above a certain income threshold, about 9 percent of the population.

(“points”), through negotiations at the national level between physicians and federal associations of sickness funds. In each region, a capped budget is divided by the number of relative value units for services provided by physicians. If physicians provide a higher volume of service, their remuneration per service is lower. Price-setting for each relative value unit of payment is driven mainly by negotiation, with little emphasis on calculating actual costs. Relative value units of services are determined through a mix of expert judgment by physicians and political negotiations between various specialty societies. A major problem in Germany is “points inflation” because doctors try to make more money, or at least the same amount as the previous year, by performing more interventions, on the assumption that their colleagues would as well, and they want to preserve their “slice of the pie.” This is difficult for sickness funds panel doctors to control, given the scale of the problem. Although the overall physician budget is controlled, secondary costs, such as what the doctors prescribe (drugs and lab tests), are not, leading to more visits to the doctor and thus to more prescriptions.

These models have often changed and evolved. In England in the early 1990s some purchasing responsibility was allocated to selected general practice (GP) fundholders with at least 11,000 registered patients. Their budgets covered up to 20 percent of the total per capita allocation for each patient, and the remainder rested with the health authority. Initially, 306 practices joined, and by 1998 there were 3,500 GP fundholding practices, covering 60 per cent of the population.

The new Labour government abolished fundholding in 1997 and established a nationwide system of primary care groups (PCGs)/primary care trusts (PCTs). Unlike fundholding, which was voluntary, membership in a PCG was compulsory for all GP practices. The average PCG covered a population of 100,000 people, although there were variations around the average ranging from approximately 50,000 to over 250,000. Over time, PCGs have been converted into PCTs. These are free standing bodies with a budget for commissioning care, covering average populations of 170,000 people and controlling about 50 percent of the overall national budget for health. It was designed to eventually control approximately 75 percent of the budget.

**Box 2. General Practitioners in the United Kingdom in the 1990s**

One of the most developed performance-based systems was that applied to general practitioners (GPs) in the United Kingdom. It is designed to provide an Intended Average Net Remuneration (IANR) to GPs (introduced in April 1997) and has various components. A basic practice allowance varies according to the number of patients on the GP's list, with flat additions for those practicing in two types of designated areas and three seniority payments. There is an additional allowance for employing a full-time assistant. To encourage doctors to practice in deprived areas there are additional payments for each patient at three different levels according to the deprivation in the area.

There are also payments based on the individual GP behavior or circumstances. A capitation fee is paid for each patient, with higher payments for patients aged 65 to 74 years and a higher level for those aged 75 years or more, which is just over two-and-a-half times the standard capitation fee. This recognizes that the elderly are likely to need more medical treatment than the young and to remove any disincentive to GPs to retain old people on their lists if they have received only the standard fee. There is a flat-rate fee for making night visits to patients.

There are flat-rate fees for items of service carried out for public health policy such as vaccination and immunization and for providing contraceptive services. Annual payments are made for carrying out health promotion programs and for chronic disease management programs for diabetes and asthma.

There are fees for providing treatment to a patient not on the GP's list, such as someone visiting the area. Allowances are paid for participating in postgraduate training and practitioner training.

Payment-by-results schemes also exist when GPs receive flat-rate payments for meeting a higher (90 percent) or lower (70 percent) targets for childhood immunization and pre-school immunization boosters.

## Hospital services

Within the hospital sector, most countries in Western Europe have moved to a performance-based approach, using some “mixed” or “blended” payment combination of case-mix adjusted Diagnosis-Related Groups (DRGs) and/or Global Budgets. Within this general framework, some diversity of approaches to payment for inpatient services (which provides the focus for this review) is in evidence. Most have developed to contain costs.

The shift to a performance-related payment scheme for inpatient hospital services in Austria in the early 1990s was driven by cost containment objectives. Allocation of funding for health system support is based on fixed-term statutory agreements between the federal government and the Lander, which in turn negotiates budgets with hospitals. While the distribution may vary, the largest component of the hospital budget is now based on the Austrian DRG system known as LKF (*Leistungsorientierte Krankenanstaltenfinanzierung*). Within the LKF-model, costs on a case mix basis may be determined at the hospital level so hospital funding may be directly related to performance. Recent research suggests an initial reduction in the growth of hospital costs though this has now begun to accelerate again.

In Belgium, DRGs are applied in a prospective budgeting framework for funding acute inpatient services. Unlike Austria, the case-mix adjustment is applied at the length of stay level. Specifically, where length of stay for a hospital differs significantly from the national average when estimated on a DRG basis, a positive or negative adjustment may be applied depending on the direction of the difference. The redistribution of funding from hospitals with long lengths of stay to those with shorter stays is intended to reward hospitals that are performing well.

Scandinavian countries have decentralized systems, but activity-based reimbursement is increasingly being used in place of the capped global budget approach. In 1997, activity-based financing (ABF) was introduced for Norwegian hospitals to encourage counties and hospitals to increase the number of hospital treatments without reducing efficiency. In this system, a proportion of the block grant from the central government to the county councils was replaced by a matching grant determined on a DRG basis. Some studies found that ABF was successful as a means to increase production without reducing cost-efficiency. As a result of poor information systems, the cost of increasing the number of patients treated was uncertain.

Responsibility for health system organization in Finland rests with the municipalities. Notwithstanding differences between municipalities in local arrangements, hospitals are increasingly using DRGs as the basis for billing municipalities for services delivered. A number of pilots are underway to test different models including the purchaser-provider model, models based on virtual and real integrated primary-secondary providers, and models based on contracting out primary care to external providers.

In response to the recession and resulting health care budget cuts in Sweden in the early 1990s, many county councils implemented reforms based on purchaser-provider split. These reforms involved: separating purchasers and providers; decentralization of budget determination and revenue generation based on DRGs; competition between private and public caregivers; and increased choice for patients. County councils that implemented the purchaser-provider split had higher productivity than those that continued to implement the traditional global budgeting approach though the latter group seemed to be more successful at containing costs.

In Denmark, global budgets are used to fund hospitals which are owned, financed, and run by county councils. While not mandatory, the so-called 90/10 model is increasingly used to fund hospitals. With this model 90 percent of the budget estimated for a projected level of activity is allocated to the hospital and 10 percent of the funding is earned by grants per treated patient. As patients can now receive treatment in any hospital of their choice, cross-county, free-choice patients are now funded by DRG-based payment. The Scandinavian countries have developed the Nord-DRG system which, while based on the DRGs, allows local adaptation in each country.

Regional hospital agencies (*Agence Regionale de l'Hospitalisation*, ARH) in France have some functions related to planning, contracting, and funding for public and private hospitals within their jurisdictions. While these agencies may come closest to playing the “purchaser” role, the extent to which this happens is questionable. The potential for purchasing-type functions may arise in relation to contracting and funding rather than planning. The ARH is supposed to sign contracts with hospitals agreeing to activities in a defined time period. While this facility should provide an opportunity to introduce tools to improve efficiency, in practice the realization of such objectives is limited. The problem of deficiencies in information systems was partially addressed with the requirement from the early 1990s of hospital participation in the *Programme de Medicalisation du Systeme d'Information* (PMSI), which collects data on activity for analysis by the French DRG-type system, *Groupes Homogenes de Malades* (GHM).

Since the late 1990s budget determination for hospitals has been partially based on the GHM system with the objective of all hospitals being funded on a GHM basis for services related to acute care from 2004. While in theory this would provide ARH with the tools and information to develop a more informed purchasing role, in practice this has not developed. This is partly because being engaged in multi-annual contractual arrangements and an annual budget cycle may constrain the ARH in that even if there is a contractual agreement to deliver a service, it is difficult to change that commitment when inefficiencies arise. Also, while the thrust of policy development is to increase the local and regional autonomy of hospitals, in reality the responsibility for significant decisions (such as wage rates) remains at the national level and thus may result in a priori constraints to more innovative practices at the regional or local level.

With the Reform Act of SHI 2000, the German federal government has committed to introduce a DRG-based payment system for hospital patients on a voluntary basis from January 2003 and on a mandatory basis from 2004. It is proposed that this system be introduced on a budget neutral basis and be based on a German adaptation of the Australian DRG system (AR-DRGs). The main objectives of this reform are “the establishment of an adequate (efficient) reimbursement, greater transparency, and a better comparability of inpatient services.”

With the regionalization of the Spanish NHS in the 1980s, autonomous regions gained responsibility for organizing and developing their own health care systems. In general, regional health care purchasers and the hospitals and primary care centers agree on annual contracts called “*contrato-programa*,” which establish the basis for prospective payments to hospitals subject to the fulfillment of contracts. With the shift to contracting, activity measures were needed to establish the specification and costing of hospital services. Over time, the DRG system has become the accepted measure of case mix in use in Spain and the general approach to hospital funding has evolved to a prospective basis, which may be

product-based or budget based or a combination depending on local circumstances. In Catalonia, hospital inpatient activity is funded by prospective global budgets adjusted for case mix with 30 percent of the budget determined on a DRG basis and 70 percent based on an assessment of hospital structural characteristics. While evidence of the results of these approaches is limited and may vary between regions, public hospital efficiency has improved, though mainly as a result of the homogenization of efficiency levels across hospitals.

A case-mix adjustment has been applied in a global budgeting framework for acute hospital services in Ireland and Portugal since the early 1990s. In both systems, an agreed proportion of the budget, determined in advance, was estimated on a DRG basis with the objective of providing incentives for increased efficiency in the provision of hospital services. In Ireland about 20 percent of the acute hospital budget is determined on a DRG basis and this level of adjustment is projected to increase over the coming years.

In the UK, provider payments to hospitals are made through the Payment by Results (PbR) system, a modified form of DRG. The original purpose of switching to the cost-per-case tariff system was to improve productivity, strengthen competition, and increase patient choice. Prior to 2004, the National Health Service (NHS) hospitals were paid through negotiated block contracts. In the new system, each admission is priced based on the nationwide tariffs for each Healthcare Resource Group (HRG). To strengthen incentives, national tariffs were based on the average cost of all hospitals for the previous two years and not on marginal costs. The tariff system was slowly phased in and by the final four-year implementation period, 90 percent of hospital activity was reimbursed through tariffs. Grouping patients into HRGs is done by a program that uses the inputs of procedures performed, all diagnoses, sex, age, duration of stay, discharge status (deceased or discharged), and whether the patient was admitted voluntarily or compulsorily. The NHS has frequently revised HRG categories and the fourth version doubled the number from 550 to approximately 1,000 categories in 2006 as a result of increased attention to complications and new technologies. To limit the number of HRGs, the NHS requires that a new HRG category must cover £1.5 million in expenditure annually and see 600 cases. There is a safeguard against excessive hospital admissions for elective care that uses a two-part tariff system, where elective procedures are paid based on the previous year's activity with a 3 percent increase, and additional procedures above that cap are only reimbursed by 50 percent (Maynard 2008). Furthermore, payment is allowed for outlier cases of long length of stays, where outliers are identified with "a trim point to be the upper quartile plus 1.5 times the inter-quartile range." Stays beyond this trim point only receive a HRG-specific rate that differs from the nationally fixed rate. Further mechanisms discourage perverse incentives such as early referral or adverse patient selection of high cost cases.

Generally in determining payment, outliers that are greater than 20 times the average are removed from the calculation and funded separately. Preliminary findings from the PbR

system show that the rate of increased activity is lower in foundation trusts that use PBR system than for other NHS providers. Length of stay has also slightly dropped in foundation trusts compared to other providers (Epstein and Mason 2006).

Australia's health system is complex, with blurred boundaries between the responsibilities of the Commonwealth and the states, and with a strong private component. Providers are paid with a mix of budgets, salaries, fee-for-service (FFS), and contracts, but public hospitals, run by the states, are paid primarily using a case mix, or DRG, system. As states are largely responsible for public hospitals and their ability to increase revenue is limited, cost containment has been a focus in public hospitals. By the 1980s, most states followed a historical, negotiated budget, but this was quickly followed by negotiated prospective budgets based on output expectations. The 1990s brought the introduction of case mix payments, modeled after the US DRG system. Since case mix was introduced, categories have been frequently revised and Australia has established its own list of diagnosis categories distinct from the US, called Australian Refined Diagnosis Related Groups (AR-DRGs). The list has been frequently revised and now has over 650 categories based on ICD-10 coding. To reduce risk selection, payment is adjusted by an index of 0-4 reflecting the degree of complications and co-morbidity. In 2008, the sixth version of DRG pricing was adopted.

Although there is some evidence that the system has led to cost reductions, the data is unclear whether quality and health outcomes have been affected as a frequently cited phrase surrounding the case mix system is that "patients are discharged 'quicker and sicker'" (Healy et al. 2006). It seems as though clinical pathways have become pervasive among hospitals with the goal of reducing length of stay and reducing costs, but their adoption seems to have been separate from the payment system as a management tool (Dowsey et al. 1999).

To set prices for DRGs, there must be a determination of a data sample (the volume of selected hospitals who provide data for costing), additions of trimming methods or policy inspection and definition of prices (negotiated by cost weight, allocation of budget by case mix, or average cost per DRG). In addition to separate payments for outliers, many nations provide additional payments for rare, high cost procedures and new technologies as well as teaching hospitals such that they do not distort the DRGs (Schreyögg et al. 2006).

## **Pay for performance**

Two methods are most promising for China given the international experience so far: innovative DRG payment for hospitals and various forms of pay-for-performance (P4P). These two are not mutually exclusive as P4P can be combined with capitated budget primary care providers or DRG types of payment for hospitals. P4P has seen a resurgence in the last few years as it is increasingly seen as a tool both to improve the performance of providers and to improve quality and actual health outcomes.

The United States has a long record of P4P. First used as a means to reduce costs in HMOs in the 1990s, P4P is now a part of Medicare, many state Medicaid programs, and many private insurers. In 2007, 82 percent of US hospitals used some form of performance-based payments (Executive Pay 2007). An ongoing demonstration, through a partnership between the Center for Medical Services (CMS) and Premier, is examining the results of P4P in CMS by requiring hospitals to disclose information on both outcome and process data in five areas including CABG and knee/hip replacements. Performance is rewarded up to 2 percent of DRG revenue (2 percent if in the top decile and 1 percent if in the second decile). According to this demonstration, the P4P program has saved an estimated 2,500 acute myocardial infarction (AMI/heart attack) patients in its first three years and has provided “approximately 300,000 additional recommended evidence-based clinical quality measures, such as smoking cessation, discharge instructions and pneumococcal vaccination, during that same timeframe” (Premier Inc 2008). Medicare pays the rewards according to the ranks of participating hospitals and results have shown a decrease in the gap between the best and worst hospitals and an overall increase in adherence to quality measures. New P4P trials in the US are underway in reforms from primary care payment restructuring, such as payment for structural changes that mirror medical homes or patient education capabilities, to shared savings systems, such as bonuses for showing reduced growth in spending in Alabama’s Medicaid program (Rosenthal 2008).

One of the innovators of P4P systems is the UK, which has added performance-based incentives for its primary care physicians (PCPs) to promote evidence-based medicine and improve chronic care management. PCPs now submit data on clinical care, patient response, and organizational structure including care of asthma, cancer, mental health, epilepsy, and hypertension as well data on level of education and training, gathering of records, and management of medications. PCPs earn points for each performance measure and payment is tied to the number of points received. The UK allocated \$3.2 billion to be distributed through the program over three years, and in the first year of implementation the average performance was 96 percent of possible points. However, as a means of adjusting for high-risk patients, the National Health Service allowed physicians to exclude certain patients with pre-determined traits. This created an incentive to “game” the system by excluding patients who become costly or appear exceedingly ill, which was confirmed by the fact that physicians who excluded the most patients received the most points. Furthermore, physicians in low-income areas were concerned that patient non-compliance would affect their results and lessen their chances of reward, as patients may be less likely to return for follow-up visits, come in for vaccinations, complete drug regimens, or follow medical advice (Christianson et al. 2007).

OECD countries are not alone in integrating P4P into their health systems. Many developing and transitioning nations working with NGOs find it beneficial to integrate P4P

into contracts with health service providers. Performance is assessed at the NGO's organizational level instead of the individual physician or hospital level. Outside contracts are pervasive in the developing world although most apply to easily measurable outputs tied to preventive and public health measures, or disease specific programs. In 1999 in Haiti, a country rife with poverty, crime, and political turmoil, USAID abandoned retrospective payment for NGOs and replaced it with a P4P model. Pilot NGOs were paid 95 percent of their previous budgets with the potential to receive up to a 10 percent bonus based on achieving set targets. The targets included five measures based on process of care (such as percentage of mothers using oral rehydration solution to treat cases of children diarrhea; full vaccination coverage for children 0-11 months; at least three prenatal visits; reduction in the level of discontinuation rate for injectible and oral contraceptives; number of institutional service delivery points with at least four modern methods of family planning; and number of outreach points with at least three or more modern methods), one on patient satisfaction and short waiting times and one on increasing coordination with the Ministry of Health.

Overall performance improved in the six years of the study. After performance-based incentives were in place, child vaccination increased by an estimated 15,000 children each year and assisted deliveries increased by 19 percent. Measurement was contracted to an independent organization during the pilot phase, but data were self-reported during implementation with random audits by an independent firm. Improved measurement and enhanced organizational skills are among the unintended, though welcome, consequences of the performance-based system. Analysis of the institutions shows a change in behavior of providers as they gain a stronger sense of professionalism and accountability. Although improvement may not be solely due to P4P incentives, the change has seen substantial performance improvements, leading to better health for the 2.7 million people who receive services from the NGOs. A challenge has been how to set realistic targets with imperfect population data; but a household survey began in 2002 to create an improved database from which targets could be set (Eichler et al. 2007). Even though China does not contract health services to NGOs, a similar project could be implemented at the institutional level with hospitals taking the place of NGOs.

In China, P4P has been introduced in some regions to promote greater access to care in rural areas (Yip and Mahal 2008). In a rural township in Guizhou Province under the Rural Mutual Health Care program, village physicians received a basic salary plus a bonus based on number of house visits and patient responses, and a bonus based on performance measures such as cost-containment (HCFP 2008). China previously used P4P in TB treatment by rewarding providers who refer patients to TB centers and by rewarding physicians who successfully treat TB patients as part of their National TB program, but when funding was scarce, this incentive system was quickly dropped (Eichler 2006). However, despite the assurance that the Chinese health care system follows DOTs protocols, it is clear that the

regimen is not strictly followed. Thus, the need to motivate health providers to follow protocols, and to have adequate accountability, is critical in improving TB care in China.

A review of P4P in disease-specific programs showed incentives at the provider level such as direct payment, food packages, vouchers, other material goods or free drugs to private providers. Globally, P4P programs cover a range of measures including process and outcome measures (case detection, appropriate referral, treatment completion or cured patient), and reward providers at the individual provider and the institutional or team level. In Bolivia payments were given to community health workers based on the number of patients cured, number of home visits conducted, supervision of other health workers, and involvement with community education sessions. As many programs are relatively recent and innovations are often implemented in tandem, it is difficult to determine their impact on improving care; nonetheless, studies that do not separate the impact of P4P from other reforms have been done and often show positive results (Beith et al. 2007).

In Afghanistan, the World Bank implemented Result Based Financing (RBF) as a means to improve the health system in rural areas served by NGOs. An additional 10 percent of the contract value is given at the end of the year if they exceed their targets by at least 10 points on their Balanced Scorecard (BSC). At least 70 percent of the bonus must be given to health workers. Poor performers are met with and if failure continues, their contract is ended. Over multiple years, if NGOs have 30 percent improvement over their baselines, they receive a bonus of 5 percent. Bonuses are also given to local health officials based on their NGO's performance. The BSC includes six domains (patients and community; staff; capacity for service provision; service provision; financial systems; overall vision) with 29 indicators. So far results are positive. Between 2003 and 2006, measures of care quality increased by 32 percent, deliveries by a skilled birth attendant more than doubled, and prevalence of contraceptives and antenatal care utilization tripled.

In Rwanda, to improve delivery and quality of care to the poor and to motivate the workforce, performance-based contracts were added to base payment at both the hospital and the physician level. Payment is based on FFS according to the volume and quality of primary health (14 indicators) and HIV/AIDS (10 indicators) services. For example, payment for a new curative consult is 100 Rwandan and for a new adult treated with antiretrovirals is 3,750 Rwandan. The MOH directly pays the facility (see Table 6 for indicators and results). Most facilities pass 80 percent of the transfers on as staff wages. Health facility volume is reviewed monthly and quality is reviewed quarterly with 111 indicators. District committees validate the self-reported facility data. Hospitals are peer-reviewed in clusters of 3-4 out of the 30 district hospitals.

In the developing world, P4P often pays for volume and not quality. For example, the maternal-child health project in Argentina pays an additional amount per individual who is enrolled in the program and who receives immunizations and well child care. Half the

benefit is paid by the federal MOH and the rest by the provincial MOH for a total of \$10 per capita-month. Enrollment jumped from 50,000 in 2005 to 529,000 in 2008, and the project is now expanding to additional provinces (Brenzel et al. 2009).

One of the most significant impediments to P4P in the developing world is the initial financial outlay to set up an adequate performance monitoring and measurement system. A lack of data to establish initial indicators or targets may delay or even halt implementation in some developing countries. Other necessary steps for P4P success include: adequate communication of the new incentive program to providers; frequent and ongoing monitoring and evaluation; and administrative management to ensure that incentives are appropriately distributed. Furthermore, frequent evaluation and flexible implementation is needed to counter problems that may arise.

**Table 6. Rwanda Poverty Reduction Support Credits/Grants**

<b>Indicators</b>	<b>Results (2005 to 2007)</b>
Number of new cases (curative services)	Under-5 mortality dropped from 198 to 103/1000
Number of new prenatal care patients	Immunizations rose from 83% to almost 100%
Number of women with 4 antenatal care (ANC) visits	Assisted deliveries rose from 29% to 52%
Number of women who have received the 2nd, 3rd, 4th, or 5th tetanus toxoid (TT) vaccination	Utilization of insecticide bed nets jumped from 4% to 65%
Number of pregnant women receiving the 2nd dose of Sulfadoxine pyrimethamine	Contraceptive use increased from 7% to 28%
Number of at risk pregnant women referred to hospital before 9 months	
Number of children 12-59 months visiting the health center for growth monitoring	
Number of new family planning (FP) subscribers	
Number of continuing FP users;	
Number of children completely vaccinated	
Number of assisted deliveries at the health center	
Number of children 0-59 months referred for severe malnutrition	

Source: Authors.

P4P also has its limitations. In any system that rewards behavior, some individuals may “game” the system to receive more reward. Requiring providers to provide data may encourage them to falsify reports. Care on non-measured activities may decline as providers focus resources on measured indicators. Eichler and Levine list seven possible mistakes in designing these P4P incentive systems:

- Failure to consult with stakeholders on the design of incentives;
- Failure to adequately explain rules;
- Entailing too much or too little financial risk;
- Having too many or imprecise definitions of performance indicators or unreachable targets for improvement;
- Tying the hands of managers so that they cannot respond fully to the new incentives;
- Paying little attention to systems and capacities needed to administer programs; and
- Failing to monitor unintended consequences.

Overall, the international record for P4P is mixed. This includes both OECD countries and transition economies. The evidence base is growing, but still emergent. In any country, including China, it may be important to begin at a relatively simple start-point, to build on successes and always engage in good monitoring and evaluation. Indeed, programs that have shown the most success require only a single focus of activity, respond to a specific disease, have standardized treatment, have fewer than ten indicators, or have a specified quantity of care defined (Eichler and Levine 2009). More specific recommendations for P4P and next steps in China are provided in the final section (below).

### **Payment incentives for integrated delivery**

A key concern in China’s health reform is creating incentives that promote an integrated delivery system in China’s levels of care. A few nations have implemented elements that could provide useful information for China.

After the original implementation of sickness funds and a risk structure compensation (RSC) scheme in Germany, there was growing variation in the risk pool, a lack of integrated care, a deterrent to accepting high-risk patients, and problems of efficiency and quality. In response, Germany introduced integrated care contracts in 2000 and disease management programs (DMPs) in 2003. Integrated care contracts allow providers to manage the complete course of care for a specific procedure (knee replacement), a certain disease (diabetes), or a medical department (psychiatry). In 2003, a financial incentive was added that allows newly integrated providers to keep 1 percent of hospital bills and payments for ambulatory care, although it must be reinvested in the integrated care program. The DMP separates patients who have chronic illnesses and weighs them more heavily when

determining reimbursements. Integration is built into the gatekeeping requirements a physician must follow to classify a patient in the DMP. With one physician acting as a gatekeeper to all specialists and receiving data from those specialists, integrated care can be improved. By 2007, sickness funds were mandated to offer GP gatekeeping contracts (Busse 2004; Hofmarcher et al. 2007; Greß et al. 2006; Blum 2007).

Australia is also working to improve care coordination. Australia has had difficulty assuring coordinated care because states pay for hospital care, which has high demand and bed shortages, and the commonwealth pays for primary care on a FFS basis. To improve coordination, Coordinated Care Trials have begun across the country; the largest is the SA HealthPlus model which included four regional sub-trials with eight different types of diseases (two for diabetes, cardiac, two for respiratory, the elderly, somatisation, and chronic/complex conditions). The model based care on evidence-based guidelines over a one-year period and was supplemented by the Care Plan On-Line (CPOL), a computerized system that is a single source for evidence-based guidelines and a database for patient information. Funding was pooled to create a single budget from Commonwealth and state sources. This budget covers medical services and administrative costs in these trials.

As a financial incentive, GPs are paid an hour's work to determine the patient's care plan as well as an annual amount per enrollee. Nurses were the basis of the program as service coordinators who were the first point of contact. They recruited patients through at-home evaluations in which they assessed patient-defined problems and goals that were rated on a scale of 0-8 (P&G approach), collected information from other providers, and initiated the service plan. The self-defined problems and goals were patient-focused and included problems such as "shortness of breath" or "I have given up many of my daily activities" and goals such as "independently going grocery shopping." After the nurses' review, GPs took on the role of care coordinators and did medical assessments and decided on services based on three levels of severity. Finally, "care mentors" review guidelines and patient plans in addition to attending conferences and mentoring the GPs. Some GPs were unwilling to participate as a result of a decrease in clinical autonomy and increased administrative tasks.

One measure of success was the goal of reducing preventable hospital admissions by 50 percent. After two years, the trial showed wellbeing improvement in the intervention group compared to the control group and potential for cost savings. In the first year, 60 percent of the intervention group saw improvements in their problems. A key component was the nurses' role as service coordinator and the focus on patient defined problems and goals (Battersby and SA HealthPlus 2005; Battersby et al. 2007).

After the trials concluded, a nationwide policy was adopted to encourage GPs to adopt a program similar to SA HealthPlus. Chronic Disease Management (CDM) programs allow for additional planning options by increasing the role of nurses and other providers and

allow flexibility in who can provide services. CDM can be applied to a GP practice or a multidisciplinary team. CDM provides funds for services:

- Preparation of GP Management Plan: provides a rebate to the GP to prepare the plan and gives a Medicare fee of \$130.65 done every 1-2 years;
- Review of GP Management Plan: provides a rebate to review plus a fee of \$65.30 to be done every 6 months;
- Coordination of Team Care Arrangements: provides a rebate plus \$103.50 every 1-2 years;
- Coordination of a Review of Team Care Arrangements: provides a fee of \$65.30 every 6 months; and
- Contribution to a multidisciplinary care plan being prepared by another provider: Medicare fee is \$63.75 every 6 months.

Patients with these plans have access to the Medicare Benefits Schedule (the national healthcare system funded by general taxes) and can claim a maximum of five allied health services per year (Australian Government 2008).

Thailand has used capitation payments to shift resources from hospitals to primary care providers and integrate the two levels of service. In 2001, a move towards universal coverage began under the 30 baht program. A new agency, the National Health Security Office (NHSO), was formed to be a purchaser and manager of care, thus separating purchaser and provider roles.

In an attempt to correct over-reliance on large hospitals, Thailand directed the largest portion of funds from the new universal coverage scheme to Contracting Units for Primary Care (CUPs). These “fundholders” are given most of the funds, and are responsible for the main provision of care; patients must register with them. CUPs receive capitation-based funding for their local health district and use the funds to “support local service units and pay for referrals.” Capitated funding was based on patient populations, so hospitals faced a 75 percent increase in demand from patients formerly not covered by insurance. Referrals to local and tertiary hospitals are paid through a DRG system based on case-mix, volume, and individual hospital characteristics. To be accredited and receive funds, CUPs must have a certain number of professional staff and be able to give comprehensive care that is located within a half hour of their patients. Conflicts arose between the different agencies (MoPH and NHSO) regarding responsibility for purchasing services and regulation.

In response to the capitation reforms, rural hospitals hired more staff while urban hospitals lost out and cut staff. In rural CUPs, the directors of community hospitals, which previously provided primary care, were given control of the CUPs. This allowed them to distribute resources based on their priorities, which largely meant that community hospitals

became the dominant providers and received the most funds as they kept patients from the district health offices, primary care units, and secondary and tertiary hospitals.

Larger hospitals also lost on the capitation scheme and many were turned to the MoPH Contingency Fund to remain operating. By 2002-03, salaries were paid at the national level and universal coverage funds were separated from the inpatient budget, thus reducing the power of capitation payments. Nonetheless, promised funding was not always paid, and disagreements on budgets between MoPH and NHSO further complicated the reforms. Areas with deficits had to cut their health promotion and disease prevention activities (Hughes and Leethongdee 2007; Towse et al. 2004). One study found that 70 percent of hospitals were unprofitable after the first year of the capitation scheme (Ngorsuraches and Sornlertlumvanich 2006).

A 2009 article suggests that the reforms have been a success as they have quickly expanded coverage to nearly all uninsured with little to no cost-sharing, and informal payments have not arisen (Damrongplasit and Melnick 2009).

## 7. Lessons and Next Steps for China

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This review provides some lessons for changing China’s provider payment system. For the methods reviewed here, which China has been piloting in various forms, the report provides an update of the current status of innovation, reviews empirical findings on their impacts, and examines the pre-conditions needed for these methods to be effective. This Policy Note posed a challenge that many countries face: how to use provider payment methods to create incentives for providers in different delivery organizations to coordinate care for patients, especially those with chronic conditions, whose care may include tertiary hospitals at the top to community care at the base. This report also suggests areas where knowledge is limited and future research efforts can be most fruitful.

First, although P4P has gained momentum as a way to improve provider performance, implementing P4P in China must be done carefully. The P4P model often leads providers to focus on activities for which performance is measured and too little effort on those for which payment is not tied. Strong P4P incentives for some services may reduce the quality of other services. The success of P4P depends on good monitoring and objective data. There is already some evidence in China that providers “make up” outcomes that give them higher performance assessment scores. The international literature is not clear as to how large the incentives (rewards or penalties) must be to generate needed behavioral change and what are the opportunity costs, including the costs of good monitoring and objective data. Many community health centers and/or township health centers in China that claim that they use P4P often tie performance to activities rather than objective or measurable indicators of quality. As a result, the incentives differ little from that of FFS payment.

Use of P4P best applies to services for which quality and outcome are clear and easy to measure, but such knowledge is missing for many health problems. P4P is most useful for health conditions where evidence-based medicine has defined clear treatment protocols and can be used for performance assessment. For other conditions, something else is needed.

Second, for China to have a sustainable health care system, it must reform its delivery system. The current system is fragmented and hospital-based. It is not cost-effective and not suitable for a population that is increasingly affected by chronic conditions that often require integrated and coordinated care across a number of providers. This is not just a problem for China. As the review demonstrates, many advanced economies face the same problem and have not found a solution. Future payment design needs to encourage more cost-effective lower levels of care such as primary care and outpatient specialist care. Future payment design also will need to conceptualize incentives for the production of health, in which different providers’ treatments are inputs to the production function. The key question is how to design incentives so that each level of provider will be motivated to

refer when necessary and only if necessary. Primary health care capitation is a model that needs more development (e.g., piloting) to address the allocative efficiency question. Experience with capitation payments for primary care providers shows that these sometimes result in too many referrals to specialists without good complements (“blended payments”) to encourage necessary care (e.g., fee-for-service for priority services such as preventive care).

Third, provider payment does not act on its own. The context in which providers work affects how the provider payment method manifests itself. For example, providers working in solo practice behave differently than those who work in groups, even if both are subject to FFS payment. The latter is also affected by norms set by the practice. The current discussion of provider payment in China has often not been fully integrated into these organizational factors.

Fourth, although many hospitals in China may be moving towards DRG payment systems, there is little attention to how incentives can be transferred to the physicians working in hospitals. Experience from the US does not readily apply to China as US physicians are not hospital staff, and they face different incentives than staff physicians, as is the case in China. Unless internal contracts are properly understood, DRG payment may not have the expected results. For example, if staff physicians continue to be rewarded from doing high-tech services, the intended impact of DRG will be significantly reduced.

Fifth, the extent to which provider payments affect provider behavior depends on the market share of payers who initiate payment changes. In urban areas where there are separate insurance schemes, unless the incentives of the different payers are aligned, the effect (or “bite”) of each payment method on a provider’s income will be limited. Similarly, if physicians have multiple jobs, the effect of incentives from each “job” will be limited. Under the table payments are another avenue through which providers can avoid any provider payment change. Unfortunately, empirical data on the extent and types of under the table payments in China are limited.

Finally, provider payment incentives are not, by themselves, a panacea for affecting provider behavior. Many other factors, including professional ethics and the effect on the relationship between physicians and patients, must be developed in parallel with provider payment change.

Further development and implementation of alternative health provider payment systems should be based on systematic evaluation of existing experiments. Evidence from such studies will help government authorities, health insurers, and hospitals to improve design and implementation of payment experiments. Comparative studies on different payment methods and settings are needed to provide information on choosing payment systems and organizing payment reforms. National organizations of NCMS and BMI could lead in organizing evaluation studies. For example, in 2008 the Beijing Bureau of Human

Resources and Social Security initiated a project to design a full DRG that will be used for BMI. The project envisaged that prices of 500-600 disease groups covering all diseases would be set up to pay the BMI contract health providers (BBHRS 2008). The national Center for Health Economics Institute (CHEI) is also working with international partners from Germany to develop the DRG payment system.<sup>6</sup> This work mainly follows the ideas of DRG implemented in Europe.

Less is known or being done in China on payment experiments for outpatient services. In a previous review (Meng 2005), payment methods of capitation, fixed salary for village doctors, and fixed charges implemented in limited counties and BMI schemes were mentioned. However, development of those methods has not advanced greatly in the recent years. With many provinces, counties, and municipalities initiating new outpatient pooling schemes, the experiments of capitation and fundholding are emergent and might be further developed.

Even with SRE showing positive outcomes, more efforts will be needed from the government to improve this method for allocating government budgets. It is important for the government to reform financing policies for primary healthcare providers by defining a clear package of health services supported by government funds, moving funds solely to the demand side, estimating costs for health care delivery, improving performance indicators, and developing an effective monitoring mechanism.

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<sup>6</sup> Discussion with Mr. Yang Hongwei from the National Health Economics Institute without written documents.

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## **Appendix: Payment Experiments--Case Studies**

### **Case 1: The Jining Case-Based Payment Experiment**

#### **(Based on report from Jining Hospital Document)**

The objective of payment for specific diseases is to standardize resource use in medical institutions, which is proportional to the quantity of inpatients, severity of diseases and intensity of services, by establishing uniform reimbursement standards. Payment for specific diseases means that the income of medical institutions is related to each case and its diagnosis, and not related to the actual cost of treating each case. From April 2004, based on cost accounting and ensuring medical quality, Jining Medical College Hospital set price ceilings for 128 specific diseases.

#### ***Significance of cost containment in the quality control of specific disease***

Compared with fee-for-service, payment for specific diseases can control rising medical costs and improve professional ethics. It encourages medical institutions to strengthen the management of medical quality, improve diagnosis and treatment, and advance medical technology. Payment for specific diseases can also encourage hospitals to establish and perfect cost accounting systems, reduce operational costs, improve the quality of medical records, improve information systems, promote standardized management of medical and administrative institutions, and encourage institutions to treat difficult and severe illnesses.

#### ***Determining management objectives for specific-disease cost containment***

Implementing specific-disease price ceilings helps control medical expenditures and ensure medical quality in clinical services. There are five management objectives:

Implement whole-course surveillance and evaluation to ensure standard diagnosis, treatment, and nursing in specific-disease services. Clinical experts make standard diagnoses, treatment and nursing for defined diseases, and nursing experts give clinical nursing directions.

Improve work efficiency and quality. Standardize work by specifying disease diagnosis and treatment, avoiding unreasonable prescription and examination. Improve work efficiency and quality, and promote professional ethics.

To facilitate the knowledge and selection of patients, doctor-patient communication is used in examination, measuring treatment costs, and prognosis, by standardizing and publicizing the routines of diagnosis, treatment, and nursing for diseases.

Reduce unnecessary patient expenditures. Regulate each medical step and physical and laboratory examination items, and reduce the waste of medical resources and the economic burden of patients.

Reduce medical defects and accidents. Using price ceilings for specific diseases, regulate diagnosis routines, treatment and nursing; strengthen doctors' and nurses' sense of responsibility; unify the rights and obligations of medical staff and patients; and prevent medical accidents and defects.

### ***Comprehensively analyzing statistical data and determining the diseases***

The hospital organized clinical doctors, financial and audit staff to select diseases based on familiarity, single diagnosis, easy to define, and strong maneuverability. Data were used to compute specific-disease average values, and specific-disease cost accounting was done. Experts established routines of diagnosis, treatment, and nursing. Based on these items, experts conducted market surveys to determine standards for specific-disease price ceilings.

### ***Establishing specific-disease standard clinical paths***

Experts developed standard clinical paths for price-limited diseases (routines of diagnosis and treatment), and determined the lowest-level diagnosis and-treatment plan that will be effective in terms of length of stay, consumed drugs, examination items, anesthesia, and operation methods. These plans are based on the routines of diagnosis and treatment. Nursing experts developed clinical nursing plans, combining the routines of diagnosis and treatment for price-limited diseases.

Related departments determined how to reduce price-limited diseases' use of equipment and consumption of materials, and made a list of concrete items and related amounts. For operations, anesthesia, and intervention materials, public bidding was used to reduce costs.

To promote implementation of price limits and regulate the use of antibacterial drugs, the hospital released the antibacterial utilization scheme in the perioperative period to improve the use of antibacterial drugs and reduce patients' cost of drugs.

To further regulate medical behavior and protect the legal rights and interests of both doctors and patients, the specific-disease price-limitation agreement involving doctors and patients was based on the related items of specific-disease price-limited operations.

After implementing price limits, follow-up investigation tables of specific-disease cost per day were distributed to assess the changes in costs of price-limited diseases.

Periodic assessment checked average length of stay, average drug expenditure, material expenditure for diseases, specific-disease examination items, percentage of effectiveness, patients' satisfaction, and evaluated the effects of specific-disease price limitations.

### ***Costing methods***

Ward cost is measured by calculating total bed-days of discharged patients during the year, computing total cost per bed-day in each ward and total bed-days of specific-disease discharged patients, and determining specific-disease bed-days and the cost per bed-day.

Costs of drugs and auxiliary examinations are based on the department's specific-disease diagnosis-and-treatment regulations to assess the scope and amount of drug use and determine drug costs according to purchase prices. Costing in auxiliary medical-technology departments uses the expenditure-rate method.

Operation and anaesthesia costs are measured by calculating yearly operation cases and time, determining the time cost per operation case, computing the average operation time of each disease type according to the original operation registrations, and then computing the specific-disease operation time and determining the expenditure of each disease type during the operation-and-anaesthesia period using the operation time of each disease type.

Computing average values of specific-disease statistical indicators is done using indicators for the past two years to compute the quality indicator of each disease type, average length of stay, average cost of each medical service and its proportion in the average total cost, and comparing this with the specific-disease price limitation. The implemented specific-disease cost is fixed at the break-even cost point.

### ***Implementation effects of case-based payment system***

In 2004, there were 2,113 price-limited discharged patients, accounting for 13.3 percent of all discharged patients. The average cost of each price-limited discharged patient was 3,609 yuan, reduced by 1801 yuan from before the price limitation. Up to now, the hospital has treated 8,266 specific-disease price-limited patients, saving 11.87 million yuan for patients. The average cost reduction for 128 diseases was 33 percent. Coverage of medical services rapidly increased. Patients in the Heart Survey Center came from all other provinces, municipality cities, and autonomous regions, except Taiwan, Hong Kong, Macao, and Tibet. This hospital finished 1,100 heart operations in the first half of 2009.

The specific-disease price limitation drove the development of clinical subjects and the implementation of new technologies and services, and increased the work amounts of the hospital at the same time. The main quality indicators were all good: the diagnosis accordance rate reached 99.6 percent, the average cure and remission rate was 96.9 percent, the average length of stay was 9.86 days and the successful rescue rate was 86.6 percent.

The material cost of the Ventricular Septal Defect (VSD) operation before the price limitation was 4,465 yuan, which fell to 2,306 yuan, a reduction of 48 percent. The cost of anaesthesia before the price limitation was 1,845 yuan, which fell to 572 yuan after the price limitation, a reduction of 69 percent. The cost of drugs before the price limit was 1,815 yuan, which fell to 923 yuan, a reduction of 49 percent.

## **Case 2: Case-Based Payment Reforms in NCMS of Zhen'an County (Shaanxi Province)**

(Based on project report and paper from Yao L and Chen Y, 2007)

The procedure for adopting case-based payment system in NCMS is given below.

### ***Baseline survey***

If fixed payment of specific disease is implemented when New Rural Cooperative Medical System (NCMS) is being operated, the two baseline surveys can be combined.

Survey period: the first 3 years. Survey scope: the status of farmers' visits to county and town-level health institutions, and a household survey. The health institutions survey includes: 1) hospitalization (disease, medication, expense); 2) delivery at hospital; 3) patient transfer to other hospitals; 4) local folk customs and the level of economic development.

### ***Selection of diseases***

Diseases in Zhen'an County were chosen on the following principles: relatively simple disease; influencing the rural labor force; high incidence; relatively large medical expenses. Specific diseases chosen are shown in Table A-1.

**Table A-1: Specific Diseases Selected for the New Payment System in Zhen'an County**

Categories	Number of diseases	Disease names
Childbirth	3	Normal delivery, abnormal delivery, hysterotokotomy
Gynecological diseases	4	Hysteromyoma, ectopic pregnancy, ovarian tumor, dysfunctional uterine bleeding
Orthopedics	10	Both forearm fracture, fracture of the distal radius, supracondylar fracture of humerus, humeral shaft fractures, skull fracture with Intracranial hematoma, chest trauma combined with severe hemopneumothorax, pelvic fracture, femoral shaft fracture, fracture of tibia and fibula shaft, fracture of tibia plateau
Surgery	6	Acute and chronic appendicitis, chronic cholelithasis, cholecystitis, intestinal obstruction, <a href="#">thyroid neoplasm</a> , hydrocele testis, Inguinal Hernia
Respiratory tract	5	Upper respiratory tract infection, acute exacerbation of chronic bronchitis, pneumonia, tuberculosis, tuberculosis pleurisy
Gastrointestinal tract	3	Acute gastroenteritis, the ulcer of stomach and duodenum, viral hepatitis,
Urinary system	2	acute glomerulonephritis, nephritic syndrome
Cardio-cerebrovascular	5	congestive heart failure, hypertension grade 3, cerebral hemorrhage, cerebral infarction, viral encephalitis

### ***Establishing an expense standard***

This is the key to the success or failure of the fixed payment of specific disease.

*Average hospitalization expense for a specific disease (yuan)* = [total hospitalization expense for a specific disease (yuan) – unnecessary expense (yuan) (examination expense, drug expense) + hospital lost-fare (yuan)] x price index ÷ number of inpatients for the specific disease

Specific disease payment standards in different medical institutions should be accounted individually. There should be a general investigation, or the sample must be sufficient to obtain a large amount of data. Expense accounting in each type of institution is necessary.

To divide payment proportions: The fixed payment of a specific disease (yuan) = personal payment (yuan) + reimbursement by NCMS (yuan).

The suitable proportion of NCMS subsidy to personal payment is 3.5:6.5 (35:65).

*Reimbursement proportion of NCMS:* Reimbursement proportion = total funds can be used to subsidize (yuan) ÷ total medical expenses of specific disease (yuan).

*Total medical expenses of specific disease (yuan):* Total medical expenses of specific disease from baseline survey (yuan) + total medical expenses of specific disease from baseline survey (yuan) × risk factor (coefficient).

*Total funds can be used to subsidize (yuan):* Serious disease funds (yuan) × the specific disease medical expenses proportion of total medical expenses.

*Serious disease funds (yuan):* Total funds of NCMS (yuan) - household account funds (yuan) - risk funds (10 percent of total funds) - adjustment funds (3 percent of total funds)

### ***Operational procedures for fixed payments for specific diseases***

Patients participating in NCMS who need to be reimbursed medical expenses should be registered and checked by the NCMS administration department, after which they can pay only the corresponding expenses according to their personal payment proportion.

Outpatient care doctors check if the disease is a specific disease according to diagnostic criteria, and the NCMS management office checks again (including patient identity, disease, registration). Fixed reimbursement expenses are paid by the Center for County NCMS Administration to corresponding medical institutions after patients are discharged .

The County NCMS management office checks discharged case histories and expenses checklists; pays fixed reimbursement expenses to medical institutions monthly; and analyzes and feeds back problems in diagnosis, treatment, charges, and reimbursements.

Attention must be paid to the following issues: medical institutions should explain possible changes of illness during treatment to patients when they are admitted to hospitals; to implement diagnosis and treatment routines, individualized treatment plans should be given to patients with special diseases to ensure safety; the county NCMS management office should collect the latest medical information, strengthen communication with medical institutions and patients, resolve related problems, and work to improve the scheme.

### ***Auditing system***

Reimbursement should be audited by medical institutions and the county NCMS management office. The Center for County NCMS administration should review information, audit case histories, audit finances, and obtain the director's approval. They should check that related materials are integrated, and that information is consistent.

The supervision department should confirm that the disease is a specific disease, or if a non-specific disease is claimed for reimbursement using the standard of a specific disease, and if the disease meets admission and discharge standards, and if diagnosis and treatment routines are implemented well, and if the reimbursement proportion is reasonable.

General audit and review again should be done.

### ***Measures of supervision and management***

There are three common problems in medical service quality:

Insufficient medical services: patients should be provided further medical services according to their illness but are not provided. Discharge standards are not met.

Excessive services: medical institutions give unnecessary medical services, provide non cost-effective service items, or provide medical services at patients' expense.

Inappropriate medical services: unsuitable services or errors in diagnosis, treatment, nursing, such as unsuitable or repeated medical examination.

### ***Supervision***

To solve the above problems, three types of supervision are needed:

(1) *Pre-Supervision*. Also called initiative supervision, to strengthen audit before medical behavior takes place, including examination and approval of medical equipment, special prescription audit, and examination and approval of special medical items.

(2) *Supervision in the act*. To audit current medical behaviors (checking patients who are now in hospitals).

(3) *Post-supervision*. Passive supervision, to check past medical behaviors (including audit of treatment status of patients reimbursed, and investigating patient complaints).

In addition, the exception principle should be used in supervision to increase efficiency. Supervisors should focus on extreme cases during supervision and inspection.

### ***The supervision and management system***

*Management of medical quality*. The NCMS Medical Technology Committee of Zhen'an County was established. Its major responsibilities include adjudicating disputes between doctors and patients, establishing medical services' technical standards and technical specifications, evaluating medical services and quality at designated medical institutions, and supervising the status of medical services' technical standards and technical specifications at medical institutions. The Medical Technology Committee has established specific admission and discharge standards for Zhen'an County NCMS for 38 specific diseases.

*Clinical admission*. Standards include the history of illness, outpatient treatment process, major clinical symptoms, physical check-up, major positive signs, and positive results of assistant examinations. Clinical discharge standards include general information, symptoms and signs, and assistant examinations' results. Due to the changeability of illness and individual patient differences, admission and discharge standards are the difficulty as well as the key to controlling medical quality in treating specific diseases.

### **Case 3: NCMS Case-Based Payment (Qianjiang, Chongqing)**

(Based on project report and paper from Yao L and Luo K, 2007)

Case-based payment for specific diseases is implemented with the NCMS. Altogether 458 categories of disease are covered including 153 internal diseases, 199 surgical diseases, 137 ophthalmology and otolaryngology diseases, and 14 psychiatric and poisoning diseases. Based on the first three years' survey of inpatient costs and the suggestions of medical staff in district and township hospitals, the NCMS set inpatient cost limits for these 458 diseases. Medical institutions must provide explanations for excessive expenditures, and reimbursements are paid only after examination and approval by the NCMS office. Otherwise, medical institutions must bear the cost. The inpatient case-based costs of township hospitals are 20 percent lower than the limits while those of the district hospitals are 15 percent higher and the case-based costs of patients with complications are 20 percent higher. Case-based costs of malignant tumors are calculated according to real expenses and are not reimbursed over the limits. The highest expense per unit of the diseases not mentioned in the above is computed as the same type of disease.

The process for determining case-based payment for specific diseases in Qianjiang District has four steps:

Calculate the first three years' average costs of every disease category in the district central hospital, the district traditional Chinese medicine hospital, the MCH hospital, and the national hospital;

Propose new prices by integrating the quotations of disease categories offered by district hospitals (quotation of every item—special treatments, special examinations and blood transfusion costs are not included) and the calculated average costs;

Negotiate with hospitals about integrated prices to obtain mutually recognized price standards;

Verify and adjust standards in neighbor county hospitals at a similar economic level.

A reporting system for excessive expenditure was implemented. Hospitals must make telephone reports to the district NCMS office on patient conditions, causes of excessive expenditures, and next treatments. All these are examined and approved by NCMS.

#### ***Review***

Both computer review and manual review are used. Inpatient conditions are manually reviewed now. Every note and the rational use of drugs are reviewed by the township office of NCMS. Medical records of discharged patients are reviewed by the district NCMS office and unreasonable expenditures are not reimbursed.

### ***Methods of reimbursement***

Both outpatients and inpatients have to pay only the co-payment. Medical institutions pay reimbursements in advance. Village clinics obtain reimbursements from township hospitals; township hospitals, community health care centers and district medical institutions obtain reimbursement from the district NCMS with effective notes and valid certificates.

### ***Re-imburement proportion***

Inpatient reimbursement proportion is 50 percent in township hospitals and community health service centers. The limit for one person is 500 yuan per year. Inpatient reimbursement proportion is 40 percent in district hospitals.

### ***NCMS accumulated funds***

Accumulated funds of NCMS were 3,747,600 yuan in 2004. The utilization rate of the funds is 84 percent, and the reimbursement rate of inpatient expenditures is 38 percent. Compared with 2003, the number of visits increased 17.4 percent at experimental township hospitals, the number of inpatients increased 55 percent, hospital business income increased 28 percent, and average monthly wages of employees increased 36 percent.

### ***Payment system***

The payment system of Qianjiang is “fee-for-service” in the case-based payment method, because total fee rates are based on fee times volume. The difference between this payment mode and the traditional mode is the upper limit of expenditures for each disease. Medical institutions cannot to exceed the limit by administrative means; otherwise they must pay for extra expenditures themselves, and “fee-for-service” must be under the upper global cap limit.

## Case 4: BMI Payment Reform in Shandong Province

(Based on Qilu Daily, 2005)

The Shandong Provincial Department of Labor and Social Security is using a case-based payment system in basic health insurance to alleviate the burden of the insured and to prompt designated medical institutions to reduce the cost of medical care. The first 61 diseases should implement non-negotiable prices, and the scope of diseases will be expanded when conditions are ripe. This suggestion has entered the stage for comments.

### *Payment method*

The primary payment is now “fee-for-service.” Under this system, some institutions obtain excess health insurance funds by providing excessive and unnecessary services. The escalation of health expenditure could not be controlled, and burdens on the insured were aggravated. Case-based payment is similar to the “overall rationing system,” and has effects on controlling health expenditures, reducing the economic burden on patients, and promoting hospitals to strengthen management. Judging from the nationwide situation, single disease which implements “overall rationing system” or overall budget cap will certainly become increasingly common.

The 61 diseases that the provincial office of health insurance has chosen include breast cancer, acute and chronic appendicitis, liver cancer, pancreatic cancer, gastric ulcer, duodenal ulcer, gastric cancer, rectal cancer, colon cancer, kidney stones, bladder cancer, thyroid cancer, thyroid cyst, spinal stenosis, tympanic membrane perforation, nasal polyps, vocal cord polyp, senile cataracts, acute myocardial infarction, patella fractures, ankle fractures, prostate cancer, and benign prostate hyperplasia. Payment standards for different diseases are based on the average expenditures of chosen cases and the provisions of health sectors, referencing standard costs of the clinical process of each disease.

Fixed health expenditures should be set for individuals to control costs and reduce individual burdens, and expenditure audit and reimbursement under “fee-for service” should be eliminated. Health insurance agencies should pay expenditures by risk-pooling funds with medical institutions, and individuals should pay expenditures when discharged.

If actual expenditure is less than 80 percent of the standard, expenditure should be paid according to actual. If actual expenditure exceeds the standard, the excess will not be paid.. The same disease may have different payments for different results. For example, if a patient is cured when discharged, he should pay based on the standard. If the patient is improved, uncured, or dead when discharged, expenditure can be paid at 80 percent of the

standard. If the patient has many diseases or complications, expenditures should be paid according to the first diagnosis, but measures should be developed for special circumstances. If the patient is re-hospitalized for the same disease within 15 days, expenditures for the second time should be paid by the institution where the patient was originally hospitalized.

## Case 5: Separating Revenues and Expenditures in Yinchuan

(Based on project report from Yu B, 2007)

### *Implementation background*

To fulfill the directive on developing urban community health services issued by the State Department, the Ningxia Hui Autonomous Region included developing community health services in its annual assessment goals. This city wanted to separate the management of medicine payment and income in its reform of urban community health services.

### *Concrete measures*

Staff salaries in community health institutions held by the government are guaranteed security as public institutions enjoying full-amount budget funds. Subsidies for operating expenses of community health services are calculated according to the income level of urban residents, community population, the items, quantity and quality of services, and related costs. Subsidies are given by local governments. The mechanism whereby the government purchases health services according to service costs will be established gradually.

Community health institutions separate the management of medicine payment and income. The government allocates full funds to pay staff salaries and the income of community health institutions is turned in to the financial departments. Owing to the financial restrictions of the Autonomous Region, staff welfare and some public expenses are paid by these institutions themselves. Most offices for the community health institutions are leasehold. The government allocates funds for lease expenses to the health bureau, which assesses the services supplied by the community health institutions and pays for lease expenses to qualified institutions. Funds are allocated for lease expenses by purchasing services, which encourages community health institutions to improve the quality of services.

To support standardized construction of community health institutions, the financial department of the Autonomous Region gives a prize of 100,000 yuan to those community health institutions that meet the criteria in the acceptance inspection.

### *Supplementary measures*

First, special assistance policies for poor people include: signing contracts in outpatient departments, de-rating expenditures, implementing specific-disease price limits, providing assistance for severe diseases, establishing an urban-poverty medical assistance system based on community health institutions, and implementing First-Treatment System at Community in the medical assistance system and urban employee health insurance.

Second, reduce the prices of drugs. Implement the zero-profit-drug policy according to the three-unification management of drugs.

***Problems encountered***

Presently, financial departments can only ensure staff salaries. Adequate public fund security is still lacking.

After allocating the full amount for staff salaries, personnel posts were reduced, which resulted in heavy work burdens for community health staff, reducing the supply of high-quality public health services.

Although the predecessors of community health institutions are different, the separate management of medicine payment and income is implemented in all these institutions. Whether the management is the government or the undertaker is not clear. This is a transition problem in the course of reform.

For the reimbursement deductible, the medical insurance department does not provide adequate policy support to community health institutions, so the First-Treatment System at Community is difficult to implement. These institutions also have to pay high computer networking management expenses.

***Policy implications***

To improve the situation, the following policies should be implemented:

Ameliorate the mechanism for input into community health institutions, ensuring adequate budget allocation for staff and public outlays.

Determine personnel posts based on the rechecked amounts of basic medical services and public health services supplied by community health institutions.

Integrate the management of community health centers, following the lead of the Changning District of Shanghai to establish community health management centers.

Coordinate the policies of health insurance department for community health institutions, and support policies related to community health institutions. For example, improving the levels of reimbursement while reducing balance billing to patients.

## **Case 6: Performance-Based Payment System, Changning (Shanghai)**

(Based on project report from Yu B, 2007)

Prices/payments are determined by the health sector and community health center after costing. Preventive funds are managed as separate special funds. Performance is evaluated by quantity and quality of basic medical and public health work done according to service requirements. For example, if a staff member meets basic workload requirements, he could get basic wage or higher. If requirements are not met, one receives a lower wage.

Compensation of the community public health service in Changning district, Shanghai, was 500,000 Yuan per 100,000 served people. Preventive funds were managed as special funds. There were 10 higher classifications and 25 lower classifications of public health service work including communicable disease control and prevention, non-communicable disease control and prevention, MCH, family planning guidance, mental health control and prevention, occupation health, water and sanitation, eye and tooth health, community health education, information management, and school health. These categories make compensation of community public health service more transparent.

Incentives for services included wages consisting of basic wage and performance wage based on maintaining basic services. Performance is evaluated by quantity and quality of basic medical and public health work done according to the requirements of the new service mode. Providers who met the requirements of the basic workload could receive wages as before or even higher. There were several incentive mechanisms that focused on encouraging the “enthusiasm” of the general practice team.

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