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Lesson-drawing under authoritarianism: Generosity and cost control in China's hospital payment reforms

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Abstract

Local policy experimentation was a driving force behind China's economic progress, but its results in the field of social policy are more ambiguous. This article takes a lesson-drawing perspective on the transfer of international hospital payment reforms to Chinese cities, focusing on the Urban Employees' Basic Medical Insurance. We distinguish two waves of reform. The first wave was driven by local government initiatives dominated by simplified versions of international models which lacked strong prospective payment components (inspirations) and protected local bureaucratic and hospital interests. The second wave was driven by central government intervention dominated by syntheses and adaptations with strong prospective payment components and was more oriented toward patients' interests. Data were collected via expert interviews, administrative documents, academic studies, and newspaper articles. We find that elements of social policy are transferred depending on central–local interaction, with pressure from the center needed to overcome local bureaucratic self-interest.

KEYWORDS
China, health insurance, hospital, provider payment, social policy

INTRODUCTION

There is a debate regarding the degree to which transnational policy learning has transformed public administration practices in China since 1979. Various in-depth case studies of local government found a strong resemblance between practices of Chinese cadre management and New Public Management approaches in Western countries (Edin, 2003; Heberer & Trappel, 2013). Newly industrialized economies such as Hong Kong or Singapore are crucial sources of ideas (Lim & Horesh, 2016; Liu & Wang, 2018; Wei et al., 2017). However, some scholars raise fundamental questions about the genuine influence of international policies (Chan et al., 2007), pointing to merely symbolic "reinterpretations" of indigenous reform agendas to strengthen their legitimation (Lisheng Dong et al., 2010). At national level, there are indicators for policy transfer in various fields (Yang, 2009; Zhang, 2016b), but China's opaque policy processes rarely allow for in-depth case studies. In a local context, there are well-institutionalized processes of policy experimentation with transfers from abroad as well as domestic policy innovations (Heilmann, 2008; Zhu, 2017). There are extensive studies of policy experimentation facilitating the proliferation of economic reforms that grow local economies and increase fiscal revenues. However, despite some initial endeavors (Liu & Sun, 2016), there is a gap in research on experimentation with international models of social policy (but see Müller & ten Brink, 2022; ten Brink et al., 2022), and with policies that consume rather than generate economic resources. Furthermore, policy transfer studies have mostly been focused on either the central or the local levels, but the interplay between the two remains under-researched.

China's healthcare system provides ample opportunity to shed light on these issues. Like in most post-Soviet countries (Wagstaff & Moreno-Serra, 2009), introducing health insurance in China led to higher health expenditures, but not better health outcomes. A core problem is the fee-for-service payment model and distorted pricing for drugs and medical services (Dong et al., 1999; Yu et al., 2012). International organizations advocate provider payment models promising cost control and improved quality of treatment through a shift from retrospective to prospective payment, and an aggregation of the unit of accounting from specific service and drug items to a higher level (Busse et al., 2011, p. 25f). Health economists have reported some experiments with provider payment reform from urban and rural China (Powell-Jackson et al., 2015; Yip et al., 2010). Among the different international models, technically complex ones such as per diem payment or diagnosis-related groups (DRGs) are particularly informative regarding policy transfer. This is because their international origins are easy to trace, especially in the case of DRGs, which only diffused globally in recent decades (Gilardi et al., 2009). Regarding experimentation, provider payment reforms are at the intersection of social and economic policy, and the distributive consequences of local policy design allow conclusions to be drawn regarding the dominant interests in local decision-making. This study thus focuses on the spread of per diem payment and DRGs in the context of Chinese provider payment reforms at large. This seemingly technical topic also has broader significance: it points to the degree to which the Chinese state can solve complex redistributive problems for which there are no simple win-win solutions.

The development of provider payment reforms in China was closely linked to the introduction of the Urban Employees' Basic Medical Insurance (UEBMI), a comparatively generous health insurance system that primarily targets formal sector employees in the urban areas. This study thus seeks to answer the following question: How did

international influences and policy experimentation shape the balance of cost control and generosity regarding provider payment in the UEBMI? To answer the question, we employ the conceptual framework of lesson-drawing (Rose, 1993). As an early form of policy transfer research (Dolowitz & Marsh, 2000), lesson-drawing operates in both international and national contexts and provides a nuanced classification of the change in the policies being transferred. In terms of methodology, this study adopts a theory-guided process-tracing approach, which allows us to reconstruct the larger process of lesson-drawing and experimentation, capturing the core causal dynamics at local level and the interplay between central and local government. The main added value vis-à-vis an in-depth single case study is that taking this approach enables us to capture central-local interaction over a prolonged period of time and to verify our hypotheses using a large number of observations from different data sources.

In terms of data, the study relies on a comprehensive review of Chinese administrative documents, newspaper articles, and academic publications, as well as expert interviews. To reconstruct the policy process up to 2018, the authors created a case database from an extensive collection of articles from academic journals and magazines, as well as newspaper articles and administrative documents taken from CNKI and other databases. Additional administrative documents were taken from the websites of various ministries involved in the reforms before 2018.[1] The most relevant documents from the database are cited in the text. For the policy process since 2019, we primarily relied on policy documents from the website of the National Health Security Agency (NHSA), which has steered the reform process since its foundation in 2018. In addition, we collected articles about the latest NHSA reforms once they became available. Nine expert interviews were conducted during two field visits in 2018. We also considered relevant data from various field trips we had conducted earlier, and interviews with key political and administrative leaders that had been published in academic journals. Most of the data is publicly available. The sources provide the richest data for describing the policy design of local provider payment approaches. The empirical inquiry thus focuses on contrasting the policy design of local experiments and their distributive consequences with our hypotheses.

The remainder of the article is organized as follows: The section "Lesson-drawing and experimentation in healthcare" formulates two working hypotheses, derived from contextualizing the lesson-drawing approach in the literature on policy experimentation in China and the political economy of the healthcare system. The section "DRGs and per diem payment in China" presents the empirical analysis, distinguishing two subsequent waves of reforms. The first wave comprised technically simple measures, which lacked the substance of international models and prioritized the interests of local governments and healthcare providers. These models largely proliferated through local experimentation. Conversely, the second wave features more complex models which bore a closer resemblance to international ones. The second wave was characterized by greater orientation toward patients' interests, with proliferation depending more on central coordination and coercive measures driving experimentation. In the final section, we discuss the results against the background of policy transfer in East Asia and conclude. Appendix A1 provides an overview of the various models employed in China; and Appendix A2 provides a timeline of the reforms. The study contributes to policy transfer research in East Asia by highlighting how changes in central-local interactions influence the elements of social policies that are transferred in the long run.

LESSON-DRAWING AND EXPERIMENTATION IN HEALTHCARE

Social policy experimentation

This section lays out the theoretical foundation and formulates some basic hypotheses. Following Marsh and Sharman (2009), we connect insights from the policy transfer/lesson-drawing approach (Dolowitz & Marsh, 2000; Rose, 1993) with the literature on diffusion and policy experimentation (Kuhlmann, 2022; Porto de Oliveira & Pimenta de Faria, 2017; Shipan & Volden, 2021), and with works on the political economy of healthcare in China. Extensive local policy experimentation facilitated the import of international policies (Heilmann, 2008). China's polity is politically centralized, and local governments are primarily accountable to higher levels of the party-state through the cadre evaluation system (Edin, 2003; Heberer & Trappel, 2013). Administratively, the state is decentralized, with most public services provided at the local level; however, fiscal resources are centralized, which makes for a dysfunctional public finance system (Wong, 2009). The resulting fiscal imbalances put the city and county level under fiscal stress, making them eager to conduct experiments that increase economic growth and local revenues, thus also satisfying economic growth targets in cadre evaluations.

However, most social policy consumes rather than generates local revenue, and local experiments in this field are typically less bold and diffuse more slowly (Heilmann, 2008). Under authoritarianism, generous social benefits are usually concentrated on crucial support groups (Mesquita et al., 2005).[2] In China's segmented and decentralized health insurance, formal sector employees constitute an important support group and enjoy relatively generous benefits under the UEBMI, whereas the generosity of benefits for the remainder of the population is much lower (Barber & Yao, 2011).[3] UEBMI funds are usually pooled at the level of prefectural cities. Increasing the inclusiveness and generosity of social benefits at the expense of local governments typically requires hierarchical steering from higher levels of the party-state (Davies & Ramia, 2008; Zhang, 2020). In the absence of such intervention, local governments would prioritize their selfinterest and the interests of important local stakeholders.

Fee-for-service and the political economy of healthcare

The political economy of China's health sector influences how provider payment reforms are designed by local governments. Public hospitals constitute the backbone of China's healthcare system, but regulatory institutions are ambiguous about how to pay for staff salaries. On the one hand, service prices since the founding of the PRC have been kept low to make healthcare affordable for the poor. As a rule of thumb, they only cover about 50% of the costs of production (Yu et al., 2012), because they "do not include salaries" (Li, 2008, p. 44). On the other hand, local governments lack resources and incentives to compensate the losses through budgetary expenditures (Wong, 2009). The modus vivendi is for staff salaries to be financed from revenues, rather than local budgetary expenditures as implied by the low service prices. Since the 1970s, public hospitals have been allowed to run pharmacies and compensate for low service prices through drug revenues (Li, 2008, p. 145). With economic reforms, drug profits were complemented by profits from diagnostic services as the main financing mechanisms (Dong et al., 1999). These regulatory institutions created distorted incentives that caused a

decline in doctors' professional ethics and problematic treatment practices (Hsiao, 2008). Reforms of the pricing system and public hospitals since 2009 have so far failed to tackle the underlying structural problems (Allen et al., 2014; Fu et al., 2018; Huang & Dai, 2019; Zhao & Zhang, 2018).

Fee-for-service pricing is a core problem of China's health sector. First, it often implies retrospective payment, meaning insured patients first pay the full amount out of pocket, before seeking reimbursement later. Second, disaggregated accounting means all drug and service items are charged separately with prices fixed in advance. Both issues enable doctors to provide medically unnecessary care for profit. International models of hospital payment reform adopt a dual strategy to address these two flaws. First, a shift from retrospective to prospective payment, directly between the insurance funds and the provider. And second, an aggregation of the unit of accounting from specific service and drug items to a higher level. Table 1 below provides an overview of the main approaches, which are usually applied to health insurance expenditures or budgetary funding (Langenbrunner et al., 2009).

The UEBMI is China's most generous health insurance: per capita expenditures amount to about 60% of urban average per capita health costs, as Figure 1 illustrates.[4] It thus provides some protection against the rising tide of medical bankruptcies (Xu et al., 2010). Financial generosity gives it strong potential to influence hospitals' incentives, but this potential can only partly be realized due to the organization of UEBMI funds: some 47.5% of the revenues enter individual Medical Savings Accounts (MSAs), rather than conventional pooling funds (Barber & Yao, 2011). MSAs are part of a demand-side approach of cost control, along with a complex system of cost thresholds, co-payment rates and reimbursement caps.[5] By limiting generosity, they should strengthen cost consciousness among patients. Furthermore, MSAs should accumulate protective resources to cope with the demographic transition (Yiliao Baoxian, 2016, pp. 267–270).[6] Figure 1 illustrates how conservatively funds are managed: the accumulated surplus as a share of UEBMI revenues has increased continuously, while the share of MSAs in the accumulated surplus remained roughly stable. MSAs and other demand-side cost controls reinforce fee-for-service payment,[7] thus limiting the application of prospective payment methods. As a result, healthcare is more expensive and less effective than it could be, which further undermines the effective generosity of benefits (World Bank, 1996, p. 69).

Working hypotheses

How do we expect these issues to affect lesson-drawing? Rose (1993) highlights governments' leeway when it comes to designing new policies based on models from elsewhere. The types of lessons he identifies include *copies* that strongly resemble the original model; *adaptations*, adjusted slightly to the new context; *hybrids* that fuse new policies with elements of the new context; *syntheses* that combine elements of different policies; and mere *inspirations* that reflect the spirit but lack the substance of the original model. We expect the mainstream of policy design to minimize the scale of change (Rose, 1993, p. 135f), that is, the scope of prospective payment, because local governments face a dual financial risk: first, overspending of the insurance funds, requiring stabilization with local budgetary expenditures. And second, public hospitals running into financial difficulties need to be bailed out with local budgetary expenditures.[8] Risk-averse governments remain close to the status quo. Furthermore, we expect the technical complexity and data quality requirements of

TABLE 1 Main international models of hospital payment reform.

	Global budget	Capitation	Per diem	Diagnosis-related groups (DRGs)
Unit of accounting	Hospital	Patient	Bed day	Diagnosis group
Level of aggregation	High	Medium	Medium	Low
Complexity	Low	Medium	Medium	High
Data requirements	Low	Intermediary	Intermediary	High (standardized high-quality discharge data)
Core advantages	Cost control, simplicity	High control of service volume and costs	Incentives to decrease costs per bed day	Adequate representation of medical costs
Core problems	Volume and quality of services may decrease	Access problems for serious or difficult cases	Prolonged hospital stays, access problems for serious or difficult cases	Manipulation of diagnoses and coding; decreasing quality of treatment

Sources: Busse et al. (2011, p. 14f), Yu (2009, p. 86).

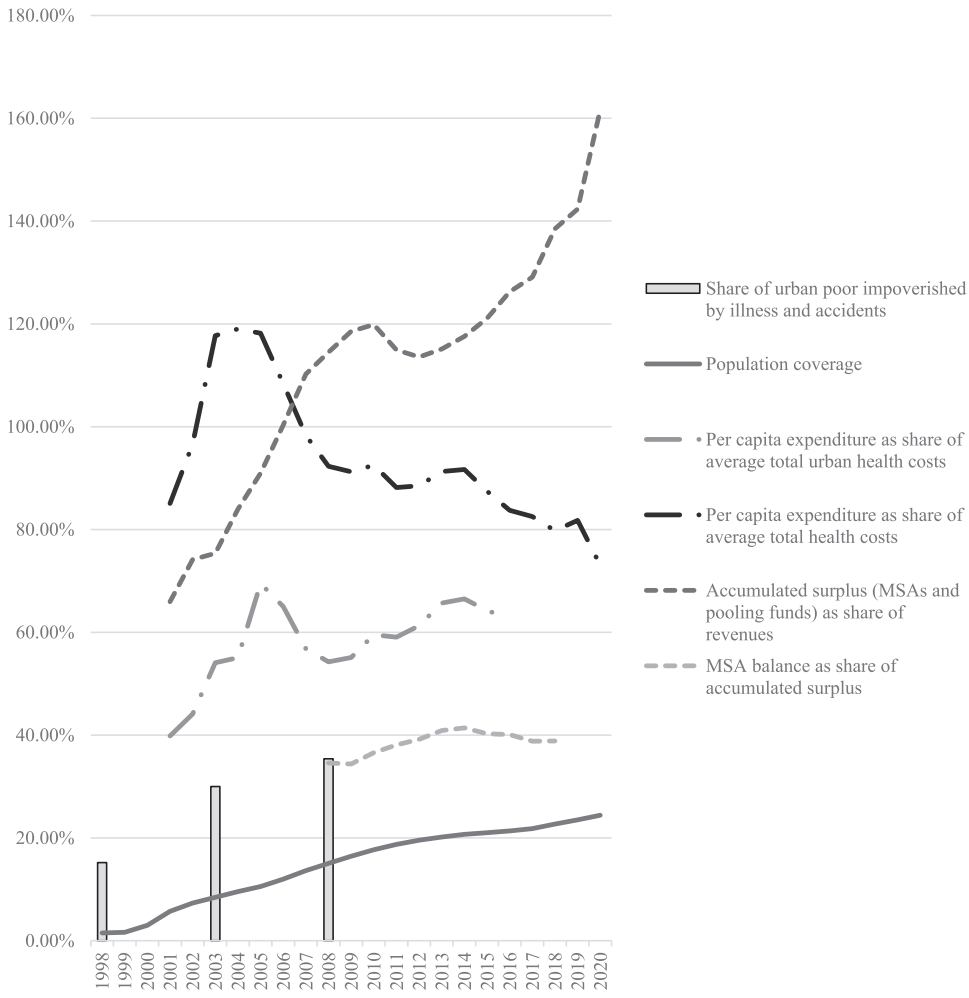

FIGURE 1 Inclusiveness and generosity of the Urban Employees' Basic Medical Insurance (UEBMI), *Sources*: MoH (2004, p. 14), MoH (2009, p. 11); Statistical yearbooks of China Health Commission (various years) and MoHRSS (various years). In 2008, 9.2% of the urban poor were impoverished due to health costs and 25.3% due to ability to work being affected. Figures on this subject have not been published since the 2013 version of the survey. Total health costs include costs covered by individuals, the state, and societal actors (including insurance funds).

international models to influence their fungibility (Rose, 1993, pp. 119–142). Large and technically complex projects such as DRGs may simply overburden local state capacity, and thus spread much more slowly in rural areas, and in socio-economically less developed Central and Western China. Based on these considerations, we formulate the following hypotheses:

H1: City governments usually prioritize cost control for the insurance funds and protect the revenues of hospitals, which implies a low scale of change, with patient interests and quality of treatment being secondary concerns.

H2: Methods with lower technical complexity spread faster among Chinese cities than methods with higher complexity, and the latter are adopted earlier on in the socio-economically more developed urban coastal areas.

DRGs AND PER DIEM PAYMENT IN CHINA

This section traces the process of lesson-drawing and policy experimentation in provider payment reforms, with a focus on per diem payment and DRGs. Table 1 provides an overview of four common models promoted by international organizations such as the WHO and the World Bank. The models are grouped in descending order of aggregation: global budgets use the hospital as the unit of accounting; capitation the patient; per diem payment the days spent in a hospital; and DRGs cluster diagnoses and treatment combinations into groups for which average prices are determined. The groups are often based on the International Classification of Diseases (ICD; Busse et al., 2011, p. 25f). DRGs are the most technically complex system. All approaches involve the payment of lump sums to which doctors cannot easily add additional service or drug items for profit, as they can with fee-for-service. But each method has its own strengths and weaknesses, and the latter can be exploited by hospitals to raise their profits. For per diem payment and DRGs, there is clear evidence of policy transfer to China and subsequent policy experimentation. Conversely, the situation is less clear for the simpler methods of global budgets and capitation.[9] Appendix A1 includes a table summarizing the variations in policy design as implemented in China for reference. Each design is coded as a "type" for easy reference in the text, such as type B3 for proper DRGs.

The first wave of provider payment reforms was based on models largely developed during policy experimentation in the late 1980s and the 1990s, which then diffused in China while the UEBMI was extended and consolidated in the 2000s. The mainstream of these approaches could be considered *inspirations* (Rose, 1993) that reflect the spirit but not the substance of international models. However, in some cases, these *inspirations* were developed outside of mainland China before they were transferred, and in others the international origin is not clear. To be precise, the "spirit" here refers to a change in the basis of accounting with the intention of facilitating cost control; and the "substance" here refers to prospective payment. City governments tend to use the changed basis of accounting as a mere cap—for the costs of an illness or the total sum of reimbursement paid at a specific hospital, for example.

The section "The first wave of reforms" proceeds chronologically, analyzing influential experiments with international models of provider payment. The section "The second wave" then analyzes the second generation of provider payment reforms, in which the previous models are being replaced by DRGs and DRG-based models featuring comprehensive prospective payment. Throughout the period of observation, we analyze a complex interplay of local initiatives and coordinating intervention from the central level. Administrative authority at central level gradually shifted from a segmented structure to a functionally integrated one (Müller, 2017), culminating in the formation of the NHSA (*Guojia Yiliao Baozhang Ju*) at central level in 2018 (He et al., 2022). Concurrently, central intervention became increasingly forceful, arguably reflecting growing dissatisfaction with ineffective and uncoordinated policies.

The first wave of reforms

Independent experiments

Some of the earliest experiments with provider payment reforms were not directly connected to systematic experiments with health insurance, which began in the early 1990s. In 1988, when the Ministry of Health (MoH) was leading a comprehensive healthcare reform (Duckett, 2011), a first attempt to create a Chinese system of DRGs was launched at the newly founded Hospital Management Research Institute in Beijing. The Institute created a system of 345 DRGs oriented mainly toward US AP-DRGs (type B3, see Appendix A), but encountered serious difficulties due to lack of IT capacity and standardized data reporting by hospitals (Deng, 2015, p. 7). The result of the project was a negative lesson: the data intensity and complexity of DRGs prevented a broader application at the time. This supports hypothesis 2.

In the same year, Kangning Hospital in the city of Jinzhou in Liaoning Province drew an inspiration from the DRG approach, which radically simplified the international model. The single-disease price caps (*danbingzhong xianjia*, type B1) upheld retrospective fee-for-service payment, but merely specified a cost ceiling for some illnesses, thus somewhat reducing patients' risk of catastrophic expenditures (Wu, 1992). This method later proved highly fungible due to the small scale of change: as of 2007, some 22% of Chinese hospitals used price caps for five or more illnesses (Wang, 2007).

Early UEBMI experiments

Experimentation with urban health insurance was initiated in 1989, when the State Council selected Shenzhen and Hainan Province in the socio-economically advanced coastal south as pilots. Experimentation on the ground started in 1991. A mixed model of social pooling and Singapore-style MSAs was designated as the model for the UEBMI in 1993 (Central Committee, 1993; Duckett, 2011, p. 73–95). In April 1994, the State Council initiated experiments with the UEBMI in two medium-sized cities: Zhenjiang in socio-economically advanced Jiangsu Province, and Jiujiang in poorer and more agricultural Jiangxi Province. Experimentation was expanded in 1996 after an evaluation of the two pilots, and the UEBMI was finally enacted by the State Council in 1998 (State Council, 1998). The following paragraphs summarize the development of provider payment reforms in the Shenzhen and Zhenjiang experiments, which prove to be the most relevant.[10]

The Shenzhen experiment continued the development of inspirations without actual prospective payment as in Jinzhou. The reform plan was completed by July 1990 and included lessons drawn from Singapore, as leading local officials later reported (Liu, 2008b). MSAs were discussed, but not yet implemented. Instead, Shenzhen chose a per diem model for cost control, which was implemented as a price cap in a fee-for-service system (type C1), as was used in Singapore at the time (Ramesh, 2008). The price caps did not require a shift to prospective payment and were thus easier to implement. But the outcomes regarding cost control were not optimal, and this was attributed to the administrative setup. The bureau administering health insurance was effectively led by the local health bureaucracy, which supposedly lacked incentives to reign in hospitals' profit-seeking practices. The key lesson was not to have the health administration in charge of health insurance due to the problem of incentives (Duckett, 2011, p. 83f; Meng, 2005; World Bank, 1996, p. 60f).

The 1994 Zhenjiang pilot had the local bureau of labor managing the UEBMI.[11] It introduced a per diem approach for inpatient services (type C2) and payment per consultation for outpatient services in 1995. For both, it applied lump sums rather than price caps (Meng, 2005), thus displaying greater determination to control costs than Shenzhen. But, as a leading official from the city explained in an interview with a leading Chinese social policy journal, the lump-sum approach (type C2) did not work as anticipated. In 1995, the pooling fund was in equilibrium; but in 1996, the average costs of care rose by 17%, and the insurance fund's expenditures by 42% (Liu, 2008c). The official interviewed attributed part of the cost increases to hospitals' countermeasures.[12] In 1997, the city introduced an individual reimbursement cap, which limited the maximum reimbursement for individual cases; and a global reimbursement cap, which limited the insurance fund's total spending. But now, hospitals began to limit the number of services provided, which led to conflicts with patients. Therefore, in 1999, Zhenjiang gave up on prospective payment and returned to fee-for-service with only a global cap (Yu, 2009, p. 88f).

However, following the return to fee-for-service, pressure on the funds continued to increase because induced demand by hospitals reportedly pushed more people above the thresholds rendering them eligible for inpatient reimbursement (Liu, 2008c). So, based on its 1999 data, Zhenjiang tested payment by disease type for 20 illnesses in 2000 (Ding & Yao, 2001). In 2001, the city then switched to lump sums for 82 diseases (type B2), accompanied by lump sums based on capitation for other inpatient services (Liu, 2008c; Yao et al., 2017). Both methods are robust against countermeasures such as unnecessarily prolonging hospitalizations. Zhenjiang retained fee-for-service payment for outpatient services. This approach became established, and the number of illnesses with lump sums was gradually extended. While some details remain unclear, type B2 constitutes an adaptation of bundling approaches, which traveled from the USA (Jacobs et al., 2015) to Singapore and Taiwan in the 1990s (Liu, 2001; Ramesh, 2008, p. 70f).[13]

Broad diffusion of simple cost control approaches

The UEBMI was enacted by the State Council in 1998 (State Council, 1998), the same year in which Zhenjiang dropped prospective payment and decided to return to fee-for-service and global caps. Overall, the pilot stage for the UEBMI had failed to create an effective provider payment model. In 1999, the Ministry of Labor and Social Security (MoLSS) thus merely issued an opinion with a set of nonbinding guidelines regarding cost accounting (MoLSS, 1999). The document named cost control as the primary target. UEBMI revenues were to determine expenditures, and specific cost control targets—global caps—were to be issued for individual hospitals. Where possible, UEBMI payments should be prospective, meaning patients pay only their co-payments out of pocket and the healthcare provider directly settles the remainder of the bill with the UEBMI administration. In terms of provider payment methods, the UEBMI could rely either on retrospective fee-for-service payment, or on prospective methods including global budgets, per diem payment (type C2), or DRGs (type B3). Experiments with prospective payment in the wake of this document laid the foundation for the second wave of reforms discussed in the following section.

Global caps diffused most widely in the first wave of reforms. The Zhenjiang pilot had demonstrated how even a city with above-average administrative capacity and previous experience in health insurance management could struggle trying to set up a functioning

prospective payment system. Most localities had worse initial conditions, and thus opted for more conservative payment systems provoking less aggressive countermeasures by local hospitals. In 2012, the Ministry of Human Resources and Social Security (MoHRSS, former MoLSS) issued a detailed set of guidelines for global caps (MoHRSS, 2012).[14] The incentives may lead to patients seeking treatment toward the end of an accounting period having to pay the costs that exceed the hospital cap out of pocket, or to change to a hospital that has not yet used up its cap. Global caps are thus a technically simple measure of cost control that prioritizes the interests of local government and hospitals over those of patients. Coverage reached 85% in 2017, and 97.5% in 2019 (MoHRSS, 2017; Ying & Cao, 2020), largely confirming hypotheses 1 and 2.

However, global caps were usually combined with other measures of provider payment. As of 2017, about 70% of pooling districts applied some form of case-based payment (type B; MoHRSS, 2017). But less than 20% adopted the comprehensive approaches of the second wave discussed in the following section (Liao & Liu, 2022). The remainder either applied partial approaches, such as the lump sums (type B2) explored in Zhenjiang; or retrospective price caps (type B1).[15] The authors' database, covering an above-average sample of roughly 5% of pooling districts, indicates that about one in five may have reached full prospective payment for pooling fund expenditures at some point before 2019 (authors' database). An expert from a research institute in Beijing that conducted a larger study on provider payment reforms in the early 2010s roughly estimated that between just 30% and 40% of Chinese cities and counties had established a prospective payment system of some sort.[16] Overall, the most widespread approach was global caps in combination with elements of case-based payments—either prospective or retrospective—with a small scale of change. This pattern of lesson drawing is in line with local governments' priority of cost control and hospital interests, and the low scale of change postulated in hypothesis 1. Furthermore, it confirms the quicker spread of technically simple measures postulated in hypothesis 2.

The second wave

As noted above, the enactment of the UEBMI was followed by renewed central-level promotion of prospective payment methods (MoLSS, 1999). Consequently, the 2000s saw a multitude of experiments in the UEBMI, and corresponding experiments in the newly established rural health insurance system (Zhang, 2016a). One of the earliest was Zhenjiang's experiment with lump sums—fixed prices—for individual illnesses (type B2) described above. Until 2017, these experiments were pursued under competing bureaucracies at national level. In 2018, responsibilities for social security and pricing in healthcare were bundled in a new administrative organ: the NHSA. In 2017, the State Council had issued an opinion that health insurance payments should use mixed payment systems with case-based payment (type B) at the core (State Council, 2017).[17] The NHSA now coordinates the two main components of the PRC's health insurance system—the UEBMI and the Urban and Rural Residents' Basic Medical Insurance. It selected two comprehensive prospective payment approaches for nationwide implementation, which is ongoing at the time of writing. This second wave of reforms effectively includes higher scale of change and is characterized by much stronger intervention from the central level than the previous wave.

Diagnosis intervention packages (DIPs)

One of the most influential approaches at the moment was created in a local experiment in the city of Huai'an in coastal Jiangsu Province. After its UEBMI pooling funds overspent, starting from 2003, the city experimented with a system called diagnosis intervention packages (DIPs, type B4), which constitutes a *synthesis* of global caps and case-based payment. This approach bears some resemblance to methods used in Thailand's DRG system, which was also introduced in 2003 (Lai et al., 2022), though some scholars associate it with health pricing practices in Germany.[18] Huai'an used the ICD-10 standard as a basis. The city issued a formal DIP standard in 2008, and a revised version in 2013; the number of illnesses covered had been gradually increased and reached 892 by 2013 (Jia & Wenqi, 2018; Zhang, 2016a, pp. 101–110).

In 2018, the city of Guangzhou launched an experiment with DIPs, which represents a more developed version of the same approach. DIPs in Guangzhou include about 13,000 illness groups (Lai et al., 2022), which are defined by the principal diagnosis and principal treatment procedure. Each group is assigned a specific number of points, which reflects the average cost of treatment based on historical data, and an adjustment factor for the type of hospital and other factors. The value of each point is determined by dividing the total sum of the planned insurance expenditures by the total number of points. This method effectively prevents the funds from overspending and means hospitals cannot be certain until the end of the accounting period precisely how much a point is worth (Liao & Liu, 2022). DIPs are attractive to city governments as they prevent overspending, but also for hospitals because they are based on historical cost data, and thus do not result in sudden and massive changes in their revenues. However, the approach may continue to reflect value distortions of the fee-for-service system.

DRGs

Apart from DIPs, various localities also attempted the adaptation of proper DRG systems following international models. Over the years, various localities and ministerial actors have created several DRG systems (Yu & Lang, 2020), sometimes with the help of international organizations such as the World Bank. Before discussing the technical differences between DIPs and DRGs further below, this section first traces the development of DRGs in the UEBMI.

The first DRG system used for insurance reimbursement was created in Beijing. In 2006, the city government initiated a new project for the development of local DRGs. A pivotal role in the experiment was played by a local doctor who had received additional training in health management in Australia,[19] and the DRG systems from Australia and the United States thus had a strong influence on the project (Deng, 2015, pp. 7–9). The first edition of Beijing DRGs (BJ-DRGs 1.0) was completed in 2008, containing 654 groups (type B3), and it was applied for hospitals' internal performance evaluations in the following year. In 2011, the city selected six level-3 pilot hospitals to test 108 DRGs for UEBMI payment (Jian et al., 2015, 2019). Subsequently, BJ-DRGs served as the basis for a new system called CN-DRGs, developed in cooperation with the National Commission of Health and Family Planning (NHFPC, former MoH). By 2019, more than 2000 hospitals in China had already adopted CN-DRGs for internal performance evaluation.[20] The diffusion of CN-DRGs also facilitated the diffusion of the ICD standard on which it was based (Gu, 2020, p. 68f).

However, the NHFPC selected another approach—called C-DRGs—for piloting and extension, which was developed at the same time. C-DRGs constituted a hybrid, as they were

based on the Chinese Clinical Disease Terminology and the Chinese Classification of Health Interventions, rather than the ICD (Yu & Lang, 2020). Based on cost data from 1278 level-3 hospitals, 958 groups were developed.[21] In October 2016, three cities were selected as pilots for C-DRGs: Shenzhen in Guangdong Province, Sanming in wealthy Fujian Province, and the city of Karamay in Xinjiang. The pilots were meant to be evaluated in 2018, and C-DRGs should subsequently have been extended. However, the pilots ran into difficulties which derailed the original plan, and C-DRGs were ultimately not implemented nationwide. Only Sanming showed satisfactory results. The city had several advantages: it had previous experience with single-disease payment, and had already prepared for implementing CN-DRGs, then shifting to C-DRGs in late 2016; the number of hospitals to implement DRGs was relatively small; it had successfully pioneered hospital reforms and overcome the fragmented administration for different health insurance systems by bundling competences in a single department; and Fujian Province was part of a World Bank project which provided financial rewards for increases in the share of patients whose inpatient care was paid through prospective case-based payment (type B2-B4; World Bank, 2017). So, C-DRGs started operating in 2018, with 796 groups covering 96% of the inpatient cases and 63% of the sum of inpatient reimbursements.[22]

The other two pilots were less successful. There is little to no information about Karamay (Gu, 2020, p. 69), and a successful experiment would surely have been reported. In Shenzhen, implementation was postponed until 2019, and by then only four of the nine original pilot hospitals were still participating. One of the difficulties was the already broad diffusion of CN-DRGs and the associated ICD standards for internal hospital evaluations: C-DRGs would have required hospitals to shift to different standards. Further, C-DRGs required a new version of the front page of patient files that was not yet widely used, so hospitals would have had to manually compile 3 years of patient records to create a data basis for C-DRGs. Moreover, the software system for health information transmission in Guangdong Province was not compatible with C-DRGs, and a new system would have been needed to transfer medical information to Beijing. There were other complications, but issues of path dependence created by the previous diffusion of CN-DRGs and the ICD standards played a dominant role in delaying progress in Shenzhen.[23]

CHS-DRGs and DIPs

While pilots with C-DRGs were ongoing, the State Council issued guidelines for the further development of provider payment reform (State Council, 2017). The focus should be on case-based payment (type B), with capitation being used for grassroots providers, and per diem payment (type C) for long-term inpatient situations. The document called for further experimentation with DRGs and issued recommendations for DIPs. In 2018, the central government followed the example of Sanming City and integrated administrative jurisdiction over health insurance in the NHSA. After the problems with C-DRGs had become apparent, the NHSA launched a large-scale pilot program for its own DRG approach in December 2018, when there were already about 20 cities experimenting with DRGs.[24] In May 2019, it issued a list of 30 official pilot cities for its new China Health Security DRGs (CHS-DRGs), including many of the previous DRG pilots. According to technical regulations issued in October, CHS-DRGs include 26 classification groups, 376 adjacent DRGs, and 618 subgroups, and they are oriented toward the ICD (NHSA, 2020). In 2020, the NHSA issued an additional pilot program for DIPs, which had already spread to 31 cities (Liao & Liu, 2022). Technical regulations and a list of 70 pilot cities were issued in November.

Also in November 2021, the NHSA decided to extend both programs nationwide within 3 years, and to cover 90% of hospitals and 70% of insurance reimbursements for inpatient costs by 2026 (NHSA, 2021). This ambitious plan envisions an unprecedented reduction of fee-for-service and retrospective payment, which will strongly affect the interests of local stakeholders. Table 2 compares the main technical features of CHS-DRGs and DIPs. Their distributive consequences mostly depend on the approach to grouping and pricing. So far as grouping is concerned, DIPs use historical data and group by principal diagnosis and treatment procedure, typically having significantly more than 10,000 groups. CHS-DRGs also utilize clinical knowledge for grouping, ending up with significantly less than 1000 groups. With respect to pricing, DIPs use a relative point-value system that prevents overspending by defining the value of each point relative to the available insurance funds. DRGs usually use a fixed cost rate that involves no such adjustment. Regarding hypothesis 1, DIPs are more in line with city governments' preferences for preventing overspending, and with hospitals' aversion to radical changes to their revenue structure. Along with the lower technical complexity (hypothesis 2), this may explain why DIPs appear to be more widely adopted. The downside to DIPs is that they are less effective than DRGs in reducing the distortions in pricing and placing an adequate value on hospitals' services (Liao & Huiying, 2022; Liao & Liu, 2022).

While the second wave of provider payment reforms so far is dominated by the DIP approach, this may be changing. In July 2022, the NHSA issued new instructions which prioritize the updating of prices for labor-intensive service items, and require the costs of labor to be reflected in the prices (NHSA, 2022). The application of these principles would gradually reduce the distortion in the

TABLE 2 CHS-DRGs and DIPs.

Payment model	China Health Security (CHS)-Diagnosis-related groups (DRGs)	Diagnosis intervention packages (DIPs)
Technical complexity	High	Elevated
Suitable implementation context	High-quality standardized data; strong administrative capacity; large population; numerous large hospitals; cooperative attitude of hospitals; balanced insurance funds; sufficiently resourced healthcare system.	Problematic data quality; average or weak administrative capacity; average or sparse population; small number of large hospitals; uncooperative attitude of hospitals; insurance funds running deficits; under-resourced healthcare system
Grouping of illnesses	By diagnosis, treatment process, resource consumption, and patient characteristics; less than 1000 groups.	Simpler clustering of illnesses based on diagnosis and treatment; adopts some ideas from DRGs; more than 10,000 groups.
Determination of service value	Clinical and statistical: group weights based more on clinical standards (clinical pathway); complex but appropriate.	Statistical: group weights based primarily on historical cost data; simple but potentially distorted.
Pricing basis	Cost-rate approach: absolute cost rate multiplied by group weight (sometimes also with point system)	Point system: relative point values determined by volume of insurance fund relative to total number of points.

Sources: Liao and Liu (2022), Ying (2021).

fee-for-service system, and implicitly relieve local governments from expenditure mandates for hospital staff salaries. If DRG prices included the costs of labor, it would be easier to apply them more broadly than previously. However, recent reform approaches in fields like pediatrics in Germany point to potential problems with the sustainability of such an approach if applied comprehensively.

DISCUSSION AND CONCLUSION

This article reconstructed the development of hospital payment methods in the UEBMI. It determined the influence of international payment models on the balance between generosity and cost control. The findings indicate that the probability of the element of prospective payment being transferred and diffused depends strongly on how the policy process is organized. This is evident in the differences between the two waves of hospital payment reform we identified. The first wave was mostly driven by local initiative. Most city governments reduced the scale of change by limiting or dropping prospective payment. They adapted the policy designs to their own preferences—balancing insurance funds and protecting hospital revenues—by retaining the spirit but not the substance of the international models. The policy designs were technically simple, but also ineffective in achieving the outcomes desired by the central government. The latter thus intervened in the second wave with greater policy coordination and pressure. The element of prospective payment is now applied more comprehensively, and the more technically complex reforms incorporate both the spirit and the substance of the international models. Their intended impact is to shift from pure cost control to greater efficiency and thus, indirectly, higher generosity.

Beyond the hospital sector, the way in which international models are put into practice also points to the Chinese government's willingness and ability to solve long-standing structural problems; and to align the interests of core stakeholders. In the second wave, the DIP program faces least opposition, for it can maintain the financial status quo for hospitals and local governments. DRGs including the costs of labor should provoke more opposition, as they redistribute hospitals' resources, while maintaining the status quo for local governments. DRGs not including the costs of labor would require redistributing the resources of hospitals and local governments, and thus provoke most opposition. So far, the central government most widely promoted the approach generating least resistance and may be preparing for a broader upgrade to DRGs including the costs of labor. The implementation outcomes will be an indicator for the capacity to solve complex redistributive problems, which in turn will strongly affect China's development trajectory in the 21st century.

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ENDNOTES

[1] For a detailed description, see Müller and ten Brink (2021).

[2] Conversely, democratization can facilitate a universalization of social benefits, as the examples of Taiwan and South Korea illustrate (Wong, 2004). Chinese social policy furthermore serves the generation of output legitimacy and repression (Heberer, 2009; Pan, 2020).

[3] They are enrolled with the Urban and Rural Residents' Basic Medical Insurance, which constitutes a merger of two previously separated urban and rural systems (Müller, 2017).

[4] The declining share of overall per capita health costs is partly related to urbanization.

[5] According to the 1998 regulations, insured patients must pay for healthcare via MSAs or out of pocket up to a cost threshold of about 10% of an average annual salary; costs above the threshold are reimbursed up to a maximum individual reimbursement cap, and patients must pay a share of the reimbursable amount in co-payments. Costs that exceed individual reimbursement caps are usually paid for out of pocket. The types of services and drugs eligible for reimbursement are further limited by explicit positive and negative lists, which exclude certain items from reimbursement.

[6] MSAs may also have facilitated workers' acceptance of premium payment, which was not common under the planned economy. Interview 20181207, with a professor in central China (Müller, 2016).

[7] MSAs are not very suitable for prospective payment, which particularly limits the potential of reform in outpatient services with their many small-scale transactions and high administrative costs. Furthermore, the many detailed cost-thresholds require fine-grained accounting with the distorted price schedules.

[8] Letting a local hospital go bankrupt may be interpreted as undermining social stability in cadre evaluations (Tam, 2011).

[9] There are similar indigenous methods of lump-sum payment (Zheng, 2008, p. 102), which were sometimes re-interpreted as international models for political reasons (Hussain, 2012, pp. 194–240).

[10] Hainan struggled to consolidate its insurance system at first (cf.: Liu, 2008a; Zhou, 2017, pp. 135–136). An experiment with prospective global budgets was initiated in 1997 (Yip & Eggleston, 2001). Jiujiang essentially followed Zhenjiang's provider payment approach at a slightly later point (Meng, 2005; Zhou, 2017, pp. 130–134).

[11] The city had previously experimented with conventional health insurance (Zheng, 2008, p. 102f).

[12] For example, outpatient visits were decomposed to multiple visits to charge the per-visit lump sum multiple times.

[13] Since 1997, the city of Mudanjiang in Heilongjiang Province used lump sums for specific illnesses in hospital payments as well (Gu, 2020, p. 70; Yu, 2009, p. 90). In the interview above, the official from Zhenjiang made no reference to international models, which may point to a lesson drawn from mainland China (Liu, 2008c).

[14] The caps should be set for each hospital based on historical data, while considering differences in the level of provision and the nature of the services provided.

[15] Such approaches have been promoted by the MoH since 2004 and have been implemented in pilot hospitals in various regions. The illness categories should be oriented toward international standards such as ICD-10, and the central health and pricing authorities have released various documents developing disease-related quality and cost standards for these approaches (Gu, 2020, p. 66f). The share of type B2 may actually have been higher than that of type B1. This was the case in rural health insurance in 2011, despite its lower administrative capacity (Yu, 2013, p. 42).

[16] Interview 20180925, with a researcher in Beijing.

[17] Technically, this vaguely formulated goal was already reached, given that 70% of pooling districts applied some form of case-based payment at the time (MoHRSS, 2017).

[18] Interview 20180814, with a professor in Beijing.

[19] Interview 20180822, with a doctor in Beijing.

[20] Interview 20181129, with a professor in Shenzhen.

[21] Interview 20181129, with a professor in Shenzhen.

[22] Interview 20181129, with a professor in Shenzhen.

[23] Interview 20181129, with a professor in Shenzhen.

[24] Interview 20181129, with a professor in Shenzhen.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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APPENDIX A

Tables A1 and B2

TABLE A1 Overview of basic hospital payment mechanisms in the PRC.

		Type B: Case-based payment *[an bingzhong fufei]*				Type C: per diem payment [*an chuangri fufei*]	
Payment mechanisms	**Type A: fee-for-service (FFS) *[an xiangmu fufei]***	**B1: revenue cap *[dan bingzhong xianjia]***	**B2: fixed price *[danbing-zhong ding'e]***	**B3: diagnosis-related groups (DRGs) *[zhenduan xiangguan zu]***	**B4: diagnosis intervention package *[an bingzhong fenzhi fufei]***	**(C1)**	**(C2)**
Prospective payment	No	No	Yes	Yes	Yes	No	Yes
Aggregation of payments	Low	Low	Low to Medium	Medium	Low to Medium	Low	Medium
Model complexity		Low	Medium	High	Elevated	Low	Elevated

Note: Based on Busse et al. (2011), Müller and Brink (2021). The ordinal scales here differ from those in Table 1.

TABLE B1 Timeline of provider payment reforms.

Year	Wave 1	Wave 2	Central policy milestones
1988	Beijing: B3 (never applied) Jinzhou (Liaoning): B1		
1991	Shenzhen (Guangdong): C1		
1994	Zhenjiang (Jiangsu): C2 (instable)		
1996	*Jiujiang (Jiangxi): C2 (instable)*		
1997	Zhenjiang (Jiangsu): C2 + global caps Mudanjiang (Heilonjiang): B2		
1999	Zhenjiang (Jiangsu): fee-for-service and global caps		MoLSS promotes prospective payment
2001		Zhenjiang (Jiangsu): B2 + capitation	
2003		Huai'an (Jiangsu): B4	
2004			MoH promotes B in seven provinces
2009			MoH initiates development of quality standards for B based on ICD
2011		Beijing: B3	
2012			MoHRSS guidelines and call for extension for global caps
2016		Sanming: B3	NHFPC launches C-diagnosis-related groups (DRGs) pilot
2017	Global caps: over 85% of pooling districts B: over 70% of pooling districts		State Council decision: focus on B
2018		B3: less than 10% of pooling districts Guangzhou: B4	NHSA launches China Health Security (CHS)-DRGs pilot program
2019	Global caps: 97.5% of pooling districts B: 86.3% of pooling districts	B4: less than 10% of pooling districts	
2020			NHSA launches diagnosis intervention packages (DIPs) pilot program
2021			NHSA plans extension of CHS-DRGs and DIPs