



Intended and unintended impacts of price changes for drugs and medical services: Evidence from China



Hongqiao Fu^{a,*}, Ling Li^b, Winnie Yip^c

^a National School of Development, Peking University; Room 202, National School of Development, Peking University, Beijing, 100871, China

^b National School of Development, Peking University; Room 201, National School of Development, Peking University, Beijing, 100871, China

^c Department of Global Health and Population, Harvard T.H. Chan School of Public Health, 665 Huntington Avenue, Building 1 Room 1210C, Boston, MA, 02115, USA

ARTICLE INFO

Keywords:

Healthcare expenditure
Price changes
Public hospitals
Healthcare reform
Cost containment
Difference-in-Difference
China

ABSTRACT

In 2012, the Chinese government launched a nationwide reform of county-level public hospitals with the goal of controlling the rapid growth of healthcare expenditure. The key components of the reform were the zero markup drug policy (ZMDP), which removed the previously allowed 15% markup for drug sales at public hospitals, and associated increases in fees for medical services. By exploiting the temporal and cross-sectional variations in the policy implementation and using a unique, nationally representative hospital-level dataset in 1880 counties between 2009 and 2014, we find that the policy change led to a reduction in drug expenditures, a rise in expenditures for medical services, and no measurable changes in total health expenditures. However, we also find an increase in expenditures for diagnostic tests/medical consumables at hospitals that had a greater reliance on drug revenues before the reform, which is unintended by policymakers. Further analysis shows that these results were more likely to be driven by the supply side, suggesting that hospitals offset the reductions in drug revenues by increasing the provision of services and products with higher price-cost margins. These findings hold lessons for cost containment policies in both developed and developing countries.

1. Introduction

Soaring healthcare expenditures have become a global concern for both developing and developed countries (Gerdtham and Jönsson, 2000; Fan and Savedoff, 2014). Consequently, many countries have implemented various policies to control the growth of healthcare expenditures; among these measures, a frequently used policy instrument is changing prices to reduce price-cost margins faced by healthcare providers. However, most existing literature that examines the effect of price changes on health expenditure growth is from the advanced economies, especially the United States (Christensen, 1992; Yip, 1998; Iizuka, 2007; Liu et al., 2009; Clemens and Gottlieb, 2014; Moreno-Serra, 2015). We have limited knowledge of their impacts in developing countries.

Intuitively, changing (reducing) fees is a simple mechanism for cost containment. In practice, providers' behavioral response makes it difficult to predict the fee changes' impact on healthcare expenditure. In a standard model of physician behavior, McGuire and Pauly (1991) argue that a physician facing price reductions will experience income and substitution effects. The model hypothesizes that when income effects are significant, physicians will respond to fee reductions by increasing

volume and intensity of treatments, especially for services with higher price-cost margins. Given this anticipated behavioral response, the actual impacts of fee changes on healthcare expenditure are not definitively known, and empirical studies are needed.

Compared to most developed countries, China faced even greater challenges in controlling its healthcare expenditure inflation (Yip et al., 2012). Total healthcare expenditure as a share of Gross Domestic Product (GDP) increased from 4.8% in 2008 to 6.2% in 2016. In addition to common factors influencing healthcare expenditure growth—such as population aging, an increasing incidence of chronic diseases, and health technology development—China must contend with the significant over-prescribing behavior of physicians at public hospitals, which was one of the leading causes of growing healthcare expenditures in China (Chen et al., 2014). Unlike most developed countries, physicians in Chinese public hospitals not only prescribed drugs, but they also dispensed them. Furthermore, they were allowed to generate profits by selling drugs with a 15% profit margin. Thus, Chinese public hospitals had built-in incentives to prescribe more drugs, especially expensive medications. Previous studies showed that the over-prescription behavior, which was driven by financial incentives, was a well-known problem in China (Li et al., 2012; Currie et al., 2014).

* Corresponding author.

E-mail address: 1201111357@pku.edu.cn (H. Fu).

In 2012, with an objective to reduce over-prescription and to control the rapid growth of healthcare expenditure, the Chinese government launched a nationwide reform of county-level public hospitals. The reform was rolled out in phases between 2012 and 2015. The central component of the reform was the zero markup drug policy (ZMDP), which removed the previously allowed 15% profit margin for drug sales at public hospitals. In order to compensate for the potential drug revenue loss, the government simultaneously raised fees for medical services that, for historical reasons, were previously set far below actual costs (Yip and Hsiao, 2008). The rationale behind this policy is that the removal of profit margin for drug sales and an associated increase in prices for medical services would reduce physicians' incentives to overprescribe and realign the incentives of public hospitals (Liu et al., 2017).

Using nationally representative hospital-level data from 1880 counties across China, this study exploits the variation in the timing of the policy implementation across counties to investigate the impacts of price changes for drugs and medical services on hospital expenditures and service volume. Also, we examine whether the impacts vary depending on hospitals' respective degrees of reliance on drug sales prior to the policy implementation. Without any behavior responses, hospitals with a greater reliance on drug sales before the reform would suffer more drug revenue loss. Therefore, they were hypothesized to respond to the policy change differently, compared to those hospitals with comparatively less reliance on drug sales. This is in particular likely given that the associated price change for medical services is a provincial-level policy that does not take into account the magnitude of the ZMDP's impact on each particular hospital's drug revenue.

As intended by policymakers, estimates show that the policy change reduced drug expenditures for outpatient care per visit and inpatient care per admission by 6.3% and 9.0%, respectively. Meanwhile, expenditures on medical services for outpatient care per visit and inpatient care per admission increased by 8.2% and 8.0%, respectively. On average, the reform did not lead to any measurable changes in the total expenditure and service utilization for both outpatient care and inpatient care. However, as a response to larger loss of drug revenues, hospitals that had a greater reliance on drug revenues before the reform showed an increase in expenditures for diagnostic tests/medical consumables, an outcome that was unintended by policymakers. Further analysis shows that these unintended consequences were more likely to be driven by the supply side rather than the demand side. These results suggest that hospitals offset the greater reductions in drug revenues by increasing the provision of services with higher price-cost margins.

These findings mainly contribute to three strands of literature. First, the results provide new evidence on the impacts of regulatory price changes. The unintended increase in expenditures of diagnostic tests/medical consumables at China's hospitals implies that price control of only certain drugs and medical services is not an effective way to control healthcare expenditure because health providers can circumvent the regulations using their information advantage. Second, our findings reinforce the previous findings that health providers may act as imperfect agents due to financial incentives. Third, this study fills the gap in the literature on the evaluation of China's nationwide reform of public hospitals. Existing studies only investigate its impacts in one or two provinces, and their findings are mixed (Zhang et al., 2017; Yang et al., 2016; Tang et al., 2018).

2. Institutional background

China introduced an inappropriate incentive system for public hospitals when it reformed its central planning economic system into a market system in the 1980s. Government subsidies for public hospitals fell from 40% to 50% of the facilities' total revenues before the economic reform to a mere 10% in the early 1990s (Blumenthal and Hsiao, 2005). Furthermore, Chinese public hospitals faced a rigid pricing system that set service fees far below actual costs and did not change for

a substantial period (Fu et al., 2017). As a consequence, public hospitals were under great pressure to break even. However, the government allowed public hospitals to generate profits by providing high-technology tests and by prescribing and dispensing drugs with a markup of at least 15%. This policy undoubtedly incentivized physicians to overprescribe expensive drugs and tests, even when they were not clinically appropriate (Yip and Hsiao, 2009). As a result, drugs sales in China's hospitals accounted for more than 40% of outpatient and inpatient revenues before the Chinese government launched the national healthcare reform plan in 2009 (As shown in Appendix Fig. 1). This number greatly exceeded the OECD average of 17% (OECD, 2015).

The Chinese government launched a nationwide reform of county-level public hospitals in 2012. In China's most areas, each county had at least one public general hospital and one traditional Chinese medicine hospital. These hospitals were the main providers of outpatient care and inpatient care for more than 800 million people in rural areas (out of China's 1.3 billion people). According to the 2012 China Health Statistical Yearbook, county-level public hospitals provided more than 50% of hospital services in China.

The reform was implemented in phases between 2012 and 2015. The central government set the goals, priorities, and macro strategies that served as the basis for provincial implementation. It was also responsible for selecting reform counties. Provincial governments were responsible for setting the operational details, such as determining the implementation schedule and adjusting service fees (Li and Fu, 2017). As shown in Fig. 1, the reform expanded rapidly. By late 2012, 18% of counties across China started to reform county-level public hospitals in their respective jurisdictions. Between 2013 and 2014, an additional 873 counties implemented the reform. All counties had been covered at the end of 2015.

Though the guideline issued by the central government required the local governments to carry out comprehensive reform measures, the central component of the reform was the ZMDP. This policy mandated removal of the previously allowed 15% profit margin for all drugs except traditional Chinese medicine. Meanwhile, the government modified the pricing schedule. More than 95% of counties simultaneously removed the drug markup and raised prices for medical services. The fees for medical services that required time input and professional skill were raised by several folds. Examples of these services include physician consultation, surgery, and nursing. For example, outpatient clinical fees per visit in Zhejiang province increased from 2 Chinese Yuan (CNY) (USD \$0.3) to 12 CNY (USD \$1.8), and the fee for an appendectomy increased by approximately 35%. Fees for advanced diagnostic tests and expensive medical consumables remained largely unchanged and highly profitable. The central government required that, on average, raised fees for medical services must compensate for more than 90% of the potential loss of drug revenue due to the ZMDP. In other words, county-level public hospitals on average would not experience a substantial financial loss after the policy implementation.

It is noteworthy that some hospitals were likely to suffer financial loss even though the government claimed that adjusting the prices for medical services would compensate for most of the drug revenue loss. This is because each Provincial Price Bureau set new prices for medical services uniformly according to the average revenue loss of all hospitals within the province, without taking into consideration the variation in drug revenue loss across hospitals. Facing these adjustments, hospitals that relied more on drug sales before the reform would suffer more revenue loss after the policy change compared to hospitals with less reliance on drug sales. For example, if it did not take any behavior response, a hospital whose drug sales was 50% of its total revenue would lose 7.5% of total revenue ($= 15\% \times 50\%$) due to the ZMDP; while a hospital would suffer a loss of 4.5% of total revenue ($= 15\% \times 30\%$) if its share of drug sales was 30%. Fig. 2 shows that the dependence on drug sales varies considerably across Chinese county-level public hospitals, ranging from 20% to 70%.

We can use the model of McGuire and Pauly (1991) to analyze the

Download English Version:

<https://daneshyari.com/en/article/7327400>

Download Persian Version:

<https://daneshyari.com/article/7327400>

[Daneshyari.com](https://daneshyari.com)