

Does Ownership Matter for Medical System Performance? Evidence From a Natural Experiment in Suqian, China

INQUIRY: The Journal of Health Care Organization, Provision, and Financing
Volume 57: 1–10
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DOI: 10.1177/0046958020944338
journals.sagepub.com/home/inq



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Abstract

There has long been a major policy debate on the role of hospital ownership (private vs public) in medical system performance. China's health care delivery system is mainly a public system. In 2000, a full privatization reform was implemented in the city of Suqian, offering a unique opportunity to assess possible effects of private delivery based on a major external shock to the existing system. Compared with all other cities in Jiangsu province since 2003, Suqian did not experience any greater increase either in total outpatient or inpatient expenditures. In the meantime, Suqian performed equally well as other cities in terms of changes in number of inpatient admissions and average inpatient days, and even better for mortality rate in emergency rooms. This study concludes that under appropriate public financing, private delivery can serve the public demand at least equally well as public providers in terms of cost inflations and utilizations.

Keywords

hospital ownership, health care reform, hospital privatization, delivery of health care, health expenditures, regression analysis, China

What do we already know about this topic?

Most of the previous literature finds no significant difference between private and public hospitals on medical expenditures and the quality of care, while some studies find mixed evidence on the impacts of hospital ownership on the performance of health care system.

How does your research contribute to the field?

As the majority of the population in Suqian has no choice between private and public hospitals, our study almost fully eliminated the selection bias problem, and thus our analysis subjects to little endogeneity concern.

What are your research's implications toward theory, practice, or policy?

The evidence shown in our study suggests that a privatized system may perform as well as public systems and even better than public systems in some aspects, and hospital privatization may not necessarily escalate medical costs.

Introduction

Health care cost inflation has been an increasing challenge facing all countries around the world. In response, extensive research and policy reforms have been explored, in an attempt to contain costs while improving access to and quality of health care. Following the seminal paper by Kenneth Arrow,¹ the role of private versus public supply in the cost of health care has long been the subject of major policy debate. Although a popular view holds that public providers may be less profit driven and therefore obtain a cost advantage compared with private providers, previous literature shows little consistent evidence. Patient selection problem is a central

issue that the majority of the studies have faced. That is, patients may be sicker in public hospitals due to unobservable conditions that may not be controlled for in studies using observational data.

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Received 27 January 2020; revised 17 June 2020; revised manuscript accepted 29 June 2020

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To explore this hypothesis, this study takes advantage of the full scale of government interventions in the city of Suqian, Jiangsu province from 2000 to 2004, when all public hospitals were transitioned to private ownership. During that period, in most other cities throughout China, public hospitals remained the dominant mode of supply of health care. As expected, the drastic reform in Suqian made big headlines in the news media in China. The reform led to a great divergence in the policy debate and public opinions on its possibly significant effects on the cost and quality of health care going forward. With many years of observations available now, the Suqian reform offers a unique opportunity for a more objective enquiry into this debate, and it permits a large-scale social experiment of how private delivery would serve the public demand as compared with public providers.

China has undergone several state-led health sector reforms since 2009, and there are increasing calls in top policy circles to give greater room and equal opportunities for the private sector to play more important roles. Meanwhile, major questions remain about the extent to which the private sector should be encouraged, to ensure positive contributions to the societal reform goals of quality and cost management. In general, people may expect gains in service efficiency—less time and better service—with the private sector. However, some are worried about quality in general and cost inflation in particular under a privatized system, because private providers' profit maximization motivation may conflict with the interests of patients. In contrast with this popular view against private sector participation, most of the previous literature finds no significant difference between private and public hospitals on expenditures and quality.²⁻⁴ Yet, previous research shares a common challenge—the patient selection problem. This study avoids this problem by considering health sector outcomes in Suqian, which has a nearly fully privatized system, compared with outcomes in other cities that have public systems. The findings of the study not only contribute to China's health sector reform initiatives but also draw implications for low- and middle-income countries with similar needs to reform their public hospital systems. The long-term evidence could help policy makers in evaluating whether a privatized delivery system could perform as well as a public system, and the analysis provides empirical insight for policy debate and future reform.

Academic and Policy Debate

There is an ongoing debate on the difference in performance between public and private hospitals. The proponents of private hospitals argue that private facilities are more flexible on price adjustment, require less public funding, and are better able to access capital. More importantly, a mixed ownership system could be more efficient than a purely public system, through enhanced competition. The opponents largely worry that private hospitals may lead to higher prices, lower quality, and selection of more profitable patients, as their target is to make a profit.

The evidence on hospital ownership is mixed. In their review of studies on hospital ownership and financial performance, Shen et al find little difference in cost among public hospitals, for-profit hospitals, and not-for-profit hospitals. For-profit hospitals generate more revenue and greater profits than not-for-profit hospitals, but the difference is only of modest economic significance.² Eggleston et al review the literature on quality of care. They find that there is no statistically significant difference between not-for-profit and for-profit hospitals in mortality or other adverse events, and public hospitals have higher mortality rates.³ Pérotin et al⁴ find that hospital ownership does not correlate with quality, but “differences in mean reported quality levels between the private and public sectors are entirely attributable to patient characteristics, the selection of patients into public or private hospitals and unobserved characteristics specific to individual hospitals, rather than to hospital ownership.” In contrast, Lien et al⁵ show that patients admitted to non-profit hospitals receive better quality of care, measured by 1- or 12-month mortality rates. Ramesh⁶ claims that public hospitals with autonomy and control mechanisms achieve economically efficient outcomes.

Aside from the mixed conclusions, both literatures (proponents and opponents of private hospitals) face the challenge of patient selection, and the results may be biased. That is, consumers choose hospitals, and the characteristics of patients who choose public hospitals may be different from those of patients who choose private hospitals. For example, patients in public hospitals may have severe illness than those in private hospitals. Even in studies that control for many patient characteristics, some unobservables could bias the results.

At the macrolevel, different countries choose different structures of the health care delivery system, and there are no dominant patterns. The United Kingdom and Canada have mainly public systems, and the majority of the hospitals in Germany, Japan, Korea, the Netherlands, and the United States are private. Many countries have mixed systems, including Australia, Finland, Spain, and others.^{7,8} Other than in the United States, the majority of the health care systems are centrally controlled and heavily regulated. A few countries have implemented policies to enhance competition, including the United Kingdom, the Netherlands, and Germany.

The majority of the studies find no difference between public and private hospitals in China, and private hospitals may even perform better in some respects. For example, Liu et al⁹ and Xu et al¹⁰ find no difference in expenditures between public and private hospitals. Deng et al¹¹ and Lan et al¹² find that patients' satisfaction is higher in private hospitals than in public hospitals. The majority of the studies find that competition could improve quality and reduce costs.¹³⁻¹⁶ For example, Pan et al¹³ find that hospital competition is correlated with better quality (in terms of lower mortality) and lower outpatient costs. Li and Liu¹⁴ find that the entry of private hospitals reduced patient expenditures in public hospitals.

China launched a new health care reform in 2009. Since then, there has been an ongoing discussion on which policies could improve the system.¹⁷⁻²³ Conditional on the mixed evidence, policy makers and researchers have not reached an agreement on whether the government should promote competition between public and private hospitals. Yip and Hsiao²⁴ warn that hospital privatization (combined with hospital-centered, fragmented delivery) may harm the system by lowering population health and increasing medical costs. In contrast, Liu et al,⁹ Xu et al,¹⁰ Zhu et al,²⁵ Zhu,²⁶ and Pan et al²⁷ argue that competition in the market should be encouraged to improve the system. Since 2010, the government has released a series of documents encouraging private investment in the health care sector, but the development of private hospitals has been limited.²⁸⁻³⁰ For example, the share of visits in private hospitals was only 14.7% in 2018.³¹ One of the reasons is that the government is uncertain about the performance of private ownership and is not confident about the power of competition, so the policies have not been fully implemented. For example, Hu³² discusses that private medical institutions still face barriers in taxes, insurance network restrictions, and other administrative regulations, compared with public hospitals.

Facing all the mixed views on hospital ownership and the diverse opinions on public policy, we aim to present long-term evidence on the performance of a health care system whose delivery sector has been almost fully privatized. From the research perspective, the reform served as an external shock to help eliminate the selection bias in policy setting, as the majority of the population has no choice between private and public hospitals, so the analysis is subject to little endogeneity concern. From the policy perspective, the reform is unique in that it permits a large-scale social experiment of how private delivery would serve the public demand as compared with public providers, providing empirical insight for policy debate and future reform.

Suqian's Privatization Reform

Around 2000, Suqian's government funding faced severe problems. Government spending had increased rapidly, and the revenue did not meet the increased spending. The government deficit as a share of gross domestic product (GDP) continued to increase, and it reached 2.26% in 1999.³³ Meanwhile, the health care system in Suqian lacked resources and was not well developed. In 2000, there were 1.04 hospital beds per 1000 persons, which was only 45.4% of the average level in Jiangsu province.³⁴ The system also suffered from low accessibility, and a large share of the population could not receive treatment because of financial constraints.

Due to the reasons mentioned above, a reform was implemented in 2000, aiming to reduce the burden on government funding, improve the health care system, and increase the accessibility and affordability of medical care. The government reformed the ownership of the public hospitals. Specifically,

the public hospitals were changed to private or mixed ownership. The government no longer owned the hospitals that directly provided medical care. Instead, the Bureau of Health only had 2 responsibilities. The first was to supervise these hospitals, and the second was to provide public health care services, including preventive care, blood provision, and emergency care. By 2004, all 135 public hospitals except one had changed its form of ownership.

China's health care delivery system is a public system, with the majority of the hospitals owned by the government. Suqian's privatization reform drew great attention. If Suqian's reform succeeded, the experience could be extended to other regions, which could have a great impact on China's health care reform. In 2006, 2 research groups visited Suqian, and they reached conflicting conclusions on the impact of the reform.^{33,35} Li³⁵ argues that the reform induced a medical arms race among hospitals; therefore, it induced overprovision of medical tests and examinations. However, Wei³³ approves of the reform and provides evidence of increased accessibility, mixed results on medical expenditures (they decreased in community hospitals and increased in county or city hospitals), and improved preventive care. The debate also drew great attention from the media, which led to a popular discussion on the performance of private systems.^{36,37}

Following the debate, researchers continued investigating the impacts of the reform. The literature has not reached an agreement. Some find that the private system is inefficient, while others argue that Suqian's system performs well.³⁸⁻⁴¹ The most notable research was conducted by Zhu.²⁶ The study shows that Suqian experienced a larger increase in medical supplies and accessibility, compared with nearby cities, and there was no evidence of worse medical practices. The most recent work was conducted by Fang and Cao.⁴² They find that medical prices and expenditures in Suqian decreased after the reform. Consumer satisfaction and self-reported health status improved. However, these studies only show evidence from relatively short periods. For example, Zhu's data on medical resources are from 1999 to 2010, and the data on medical costs and inpatient rates are from 2006 to 2010. Fang and Cao's analysis is from survey data covering 1989-2011.

Since 2009, the Chinese government has initiated a new health care reform and implemented several new policies. It is possible that those policies could not be efficiently applied to a privatized system. Therefore, we provide the latest evidence on the performance of Suqian's health care system, particularly focusing on the period of the new health reform. This study should have great policy relevance for the next step in China's health care reform.

Model

To investigate the impact of hospital ownership on performance, we use a difference-in-difference (DID) estimation

Table 1. Descriptive Statistics, 2003.

	Jiangsu			Suqian
	Mean	Minimum	Maximum	
Outcome variables				
Number of inpatient admissions (thousands)	184.4	98.3	327.0	108.1
Average inpatient days	11.8	6.5	14.6	9.5
Mortality rate in emergency rooms (%)	0.09	0.05	0.18	0.10
Control variables				
GDP per capita (yuan, thousands)	19.0	5.4	47.7	5.4
Population (thousands)	5510.7	2671.9	9086.6	5172.6
Engel coefficient of rural households (%)	42.7	37.6	50.4	50.4
Number of hospital beds per 1000 population	2.5	1.2	3.9	1.2
Number of medical staff per 1000 population	3.5	1.4	5.6	1.4

Note. The data on mortality rate in emergency rooms in Taizhou in 2003 were abnormal and dropped. GDP = gross domestic product.

strategy with multiple control variables. The conditions in Suqian may have time patterns, so we compare Suqian with other cities in Jiangsu province, assuming that the time patterns would be the same between Suqian and other cities if no privatization reform had been conducted in Suqian. In addition to hospital ownership, the performance of a health care system could be affected by other factors, such as economic development, population, and medical capacity, so multiple variables are controlled in the regression. The regression model is as follows:

$$y_{it} = \alpha \times Suqian_i \times Post_t + \beta \times X_{it} + T_t + C_i + \varepsilon_{it}.$$

In the regression, y_{it} is the outcome variable in year t for city i , including expenditure, utilization, and quality measures; $Suqian_i$ is a dummy variable, indicating whether city i is Suqian or not; $Post_t$ is a dummy variable, indicating whether year t is after the reform. The privatization process was finished in 2004, so the years after 2004 are defined as post the reform. $Suqian_i \times Post_t$ is the product of the 2 variables, so the coefficient represents the difference between Suqian and other cities after the reform. X_{it} represents a group of control variables, including measures of economic development, population structure, and medical capacity. T_t represents time fixed effects, and C_i represents city fixed effects.

Data

The data we used for the regression were collected from the Jiangsu Statistical Yearbook and Jiangsu Health Yearbook from 2003 to 2018. Unfortunately, medical measures before 2003 have not been released. Table 1 shows the descriptive statistics for variables used in the regression. As we wanted to collect the information as early as possible, there are only a few variables available. The outcome measures are the number of inpatient admissions, average inpatient days, and mortality rates in emergency rooms. The control variables

are GDP per capita, population size, Engel coefficient of rural households, number of hospital beds per 1000 population, and number of medical staff per 1000 population.

Table 1 shows that Suqian had a lower than average number of inpatient admissions, fewer average inpatient days, and a higher mortality rate in emergency rooms in 2003, compared with the average levels in Jiangsu province. Suqian was less developed than other cities in general, as it had a lower GDP per capita and a higher Engel coefficient than Jiangsu's average levels. Medical resources were scarcer in Suqian. The health yearbook released more variables after 2008, and the descriptive statistics for Suqian and the province's average level in 2008 are shown in Table 2. The conditions in 2008 are similar to those in 2003.

Results

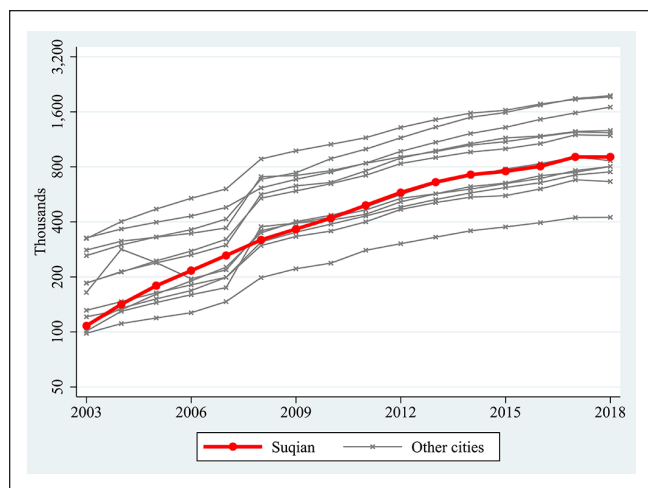
We first show the raw patterns of the measures. Figure 1 shows the number of inpatient admissions for Suqian and 12 other cities from 2003 to 2018 in ratio scale. The measure increased in all the cities over time. Suqian experienced a greater increase before 2007, and then its pattern become comparable to other cities. Figures 2 and 3 display the pattern for the average inpatient days and mortality rate in emergency rooms, respectively. The average inpatient days was lower in Suqian than in the other cities throughout the period after 2004. The mortality rate in emergency rooms in Suqian has been comparable to that of other cities and remained relatively low in the past decade. Due to data limitations, we cannot investigate the pre-trends between the control and treatment groups, but the figures suggest that the conditions in Suqian were comparable to those in the other cities in 2003 and 2004.

Table 3 reports the regression results. Columns 1 to 3, 4 to 6, and 7 to 9 show the results for inpatient admissions, average inpatient days, and mortality rate, respectively. It shows that the reform reduced the mortality rate in emergency rooms by 0.0366%, while the impacts of the reform in Suqian

Table 2. Descriptive Statistics, 2008.

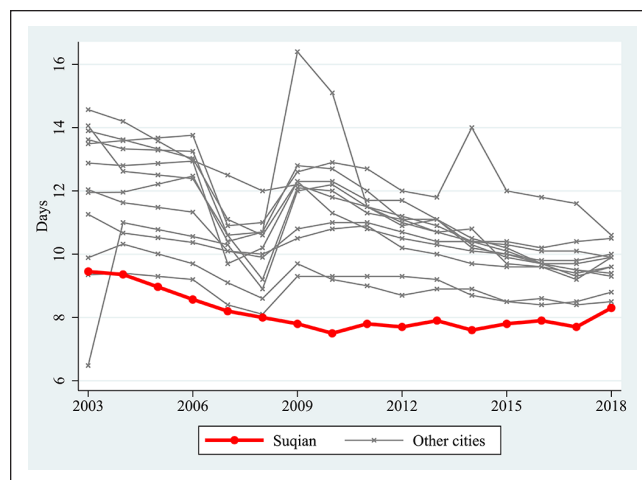
	Jiangsu			Suqian
	Mean	Minimum	Maximum	
Outcome variables				
Number of inpatient admissions (thousands)	477.1	198.2	883.8	318.9
Average inpatient days	9.8	8.0	12.0	8.0
Mortality rate in emergency rooms (%)	0.05	0.03	0.08	0.06
Outpatient medical expense per visit (yuan)	149.2	83.2	193.6	83.2
Outpatient medication expense per visit (yuan)	73.7	40.9	98.4	40.9
Outpatient examination and treatment expense per visit (yuan)	45.5	22.1	64.0	22.1
Inpatient medical expense per visit (yuan)	7134.8	3397.7	10521.0	3397.7
Inpatient medication expense per visit (yuan)	3373.7	1666.1	4711.4	1666.1
Inpatient examination and treatment expense per visit (yuan)	1682.2	672.0	3382.9	672.0
Control variables				
GDP per capita (yuan, thousands)	42.9	12.3	106.9	12.3
Population (thousands)	5905.0	3040.7	9126.5	4746.5
Engel coefficient of rural households (%)	39.5	35.4	45.7	45.7
Number of hospital beds per 1000 population	2.8	2.2	3.6	2.2
Number of medical staff per 1000 population	3.7	2.5	5.6	2.5

Note. GDP = gross domestic product.

**Figure 1.** Number of inpatient admissions, 2003 to 2018.

on the other 2 measures are all statistically insignificant, although the coefficients are negative. The results suggest that the privatization did not change the performance patterns and may even improve the quality in some aspects.

Medical expenditure is also an important indicator for measuring the performance of a medical system. However, data on medical expenditure were not available until 2008. Hence, we cannot conduct the standard DID analysis. Instead, we investigate the impacts after 2008 relative to 2008. Figures 4 and 5 illustrate the ratio scale patterns in the outpatient and inpatient expenditure measures, respectively, including total, medication, and examination and treatment expenditures. The figures show that the medical expenditures have increased in Suqian and other cities over time, and

**Figure 2.** Average inpatient days, 2003 to 2018.

the expenditures in Suqian have kept the lowest from 2008 to 2018.

For the regression, we set the year 2008 as the pre-period and years after 2008 as the post-period. The purpose is to test whether the new health care reform had different impacts in Suqian (a privatized system) and other cities (public systems). Due to space limitations, we only report the coefficient on the product, $Suqian_i \times Post_t$, for the regression with all the control variables. As presented in Table 4, the examination and treatment expense per inpatient visit decreased significantly, by 451.7 yuan, which contributed to the considerable decrease of 922.8 yuan in the total medical expense per inpatient visit. The total medical expense per outpatient visit decreased by 13.17 yuan, although it is only significant at 0.1 level.

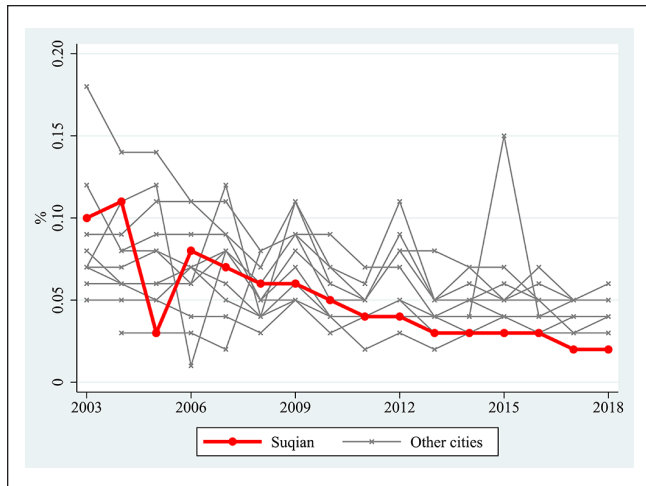


Figure 3. Mortality rate in emergency rooms, 2003 to 2018.
Note. The data for Taizhou for 2003 were abnormal and dropped.

Discussion

Combining all the evidence presented here, the results suggest that Suqian's privatized system has performed as well as that of other public systems in general or even better in some aspects. Compared with the pre-reform conditions, the reform reduced the mortality rate in emergency rooms by 0.0366%, and it had no significant effect on the number of admissions or average inpatient days. Over a relatively long period, medical expenditures in all aspects remained low in Suqian, compared with other cities in Jiangsu province.

From these findings, it seems that ownership is not a key determinant of hospital performance. According to economic theory, a private system would function well only when some conditions are met, such as that patients should be well informed and there is sufficient competition among hospitals in the market. A possible reason for the good performance of the medical system in Suqian could be competition, as there are more than 100 hospitals in the city. Another reason could be sufficient government supervision, which would help to reduce inappropriate behaviors from the supply side, such as overuse of medical resources or medical insurance fraud. In addition, some other factors could also contribute to the good performance. For example, as the economy of the society develops and the medical technology improves, diagnostic accuracy would be improved and medical staffs would be better trained. Both of them will help hospitals to maintain high quality of medical care.

China's health care system has been dominated by the public sector. The government has favored the public hospitals, under the belief that private hospitals would have stronger financial incentives and may destroy the market. There have been barriers to private hospitals for a long time. Since the new health care reform was implemented, the government has tended to encourage private investment in the sector. The logic is to weaken the monopoly power of public

hospitals and enhance competition between private and public facilities. The privatized system in Suqian has performed as well as the public system for a long period after the reform. Its experience suggests that introducing policies that promote competition could be a reasonable way to improve the provision of health care. Government supervision and competition have jointly regulated the market, and they have worked well. For future reforms, the government could consider reducing the barriers faced by private hospitals, to provide a fair environment for competition.

The government has continued to implement policies to control costs and improve the health care system over the past 2 decades, such as the global budget for social health insurance and the zero-markup drug policy. These policies may interact with hospital ownership and affect providers' behaviors. Due to data limitations, we cannot examine the impact of each policy, but the DID analysis is helpful for detecting the impacts in general. The results show that, in Suqian, there were no significant changes in hospital utilization after the reform, the quality of health care has improved slightly in a statistically significant way, and medical expenditures have kept the lowest among cities in Jiangsu province after 2008. As is shown in the figures, the levels of indicators in Suqian have changed over time, but the patterns have been stable and similar to those in other cities. Therefore, although other policies have been implemented, it seems that they have had similar impacts on the private and public health care systems.

These findings contribute to the literature as follows. Almost all previous studies faced the endogeneity problem when analyzing the issue of hospital ownership. When public and private hospitals exist in the same markets, consumers choose their preferred hospitals, so consumers' characteristics may bias the outcomes. However, in this analysis, the selection concern is almost fully eliminated. All hospitals in Suqian are privatized except one, and the residents have almost no choice of public facilities, especially for primary care. Meanwhile, however, patients may choose to seek care outside Suqian. Due to data limitations, we cannot explore this possibility. No conclusions can be drawn at this point without further analysis, although there is some weak evidence. If patients' outflow happened in Suqian, it is likely that medical utilization in Suqian may decrease, and the utilization in its nearby cities would increase. Figure 6 illustrates the number of admissions in Suqian and its 3 nearby cities, including Xuzhou, Lianyungang, and Huaian. It shows that the number of inpatient admissions had kept increasing after the reform, and the pattern in Suqian is very similar to the pattern in Huaian and is comparable to other cities, which suggests that there may not be a large wave of patients seeking care outside Suqian.

In Suqian, the major cause of the reform was that the government faced a high fiscal deficit and could not afford the public hospitals. After the reform, the government only supervises the private hospitals and does not support them

Table 3. Regression Results on Utilization and Quality Measures.

	Number of inpatient admissions (thousands)			Average inpatient days			Mortality rate in emergency rooms (%)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Suqian × Post	-70.40 (-1.11)	-131.6 (-1.43)	-87.32 (-0.95)	-0.0674 (-0.18)	-0.0291 (-0.06)	-0.175 (-0.31)	-0.0371 (-4.90)***	-0.0379 (-4.29)***	-0.0366 (-3.94)***
Post 2004	488.0 (7.68)***			-1.357 (-3.55)***			-0.0258 (-3.41)***		
Suqian	-84.86 (-3.15)***			-2.621 (-4.86)***			0.0235 (2.61)***		
Number of hospital beds per 1000 population		138.0 (0.95)	264.5 (2.61)**		0.849 (1.81)*	0.844 (1.73)		-0.0162 (-1.48)	-0.0153 (-1.47)
Number of medical staff per 1000 population		-50.32 (-0.40)	-37.79 (-0.48)		-0.701 (-1.97)*	-0.736 (-1.92)*		0.0139 (1.83)*	0.0103 (1.51)
GDP per capita (yuan, thousands)			1.207 (0.38)			-0.00901 (-0.61)			0.000306 (1.21)
Population (thousands)			0.131 (5.62)***			0.000118 (0.53)			-0.0000507 (-1.74)
Engel coefficient of rural households (%)			10.23 (0.88)			-0.0374 (-0.55)			-0.00177 (-1.36)
Constant	209.7 (7.80)***	18.78 (0.07)	-1521.7 (-2.43)**	12.03 (22.32)***	12.13 (11.61)***	13.38 (4.36)***	0.0815 (9.08)***	0.0813 (5.91)***	0.189 (3.05)**
Year fixed effect	N	Y	Y	N	Y	Y	N	Y	Y
City fixed effect	N	Y	Y	N	Y	Y	N	Y	Y
N	208	208	208	208	208	208	207	207	207
R ²	0.217	0.854	0.903	0.149	0.573	0.579	0.178	0.456	0.483

Note. T statistics are reported in parentheses. The data on mortality rate in emergency rooms in Taizhou for 2003 were abnormal and dropped. GDP = gross domestic product. Significance level at *P < .10. **P < .05. ***P < .01.

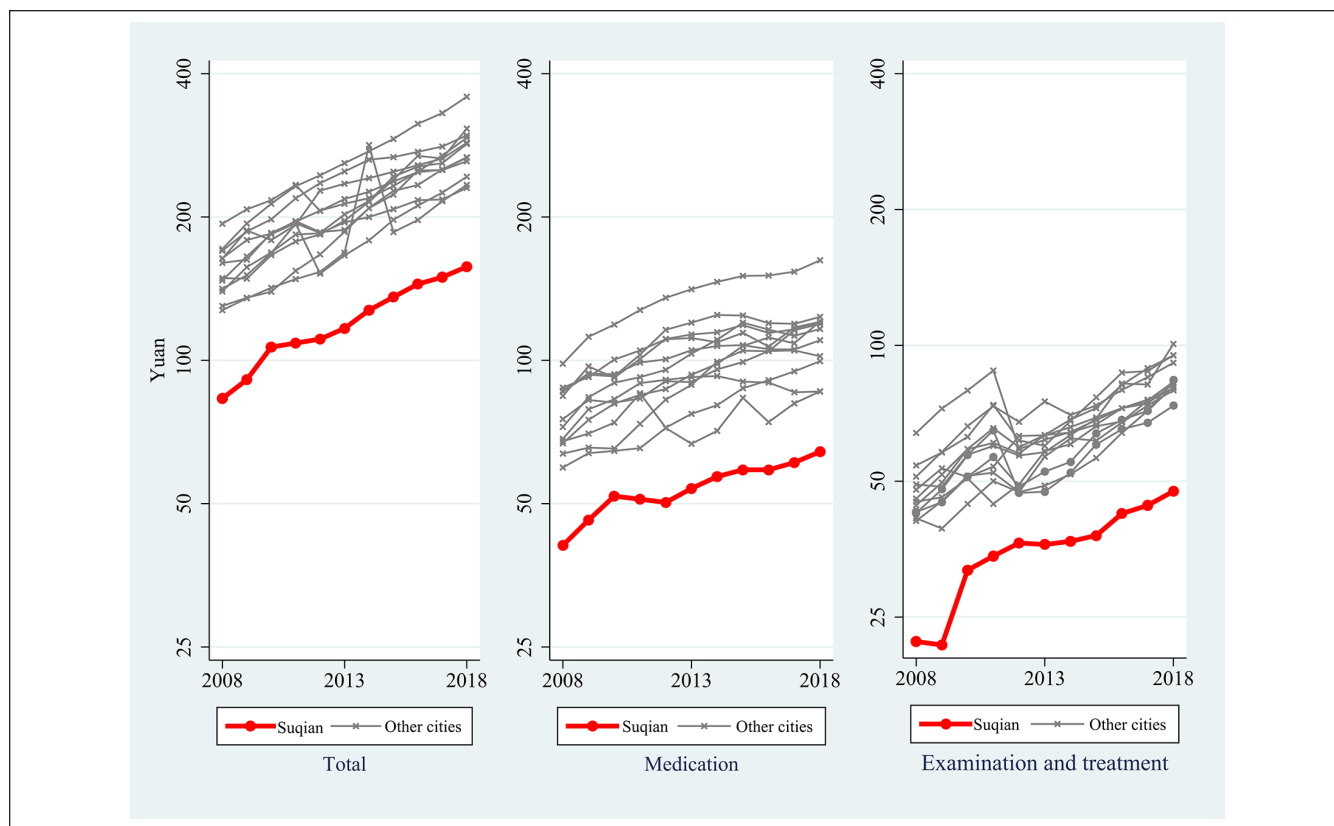


Figure 4. Outpatient expenditures per visit, 2008 to 2018.

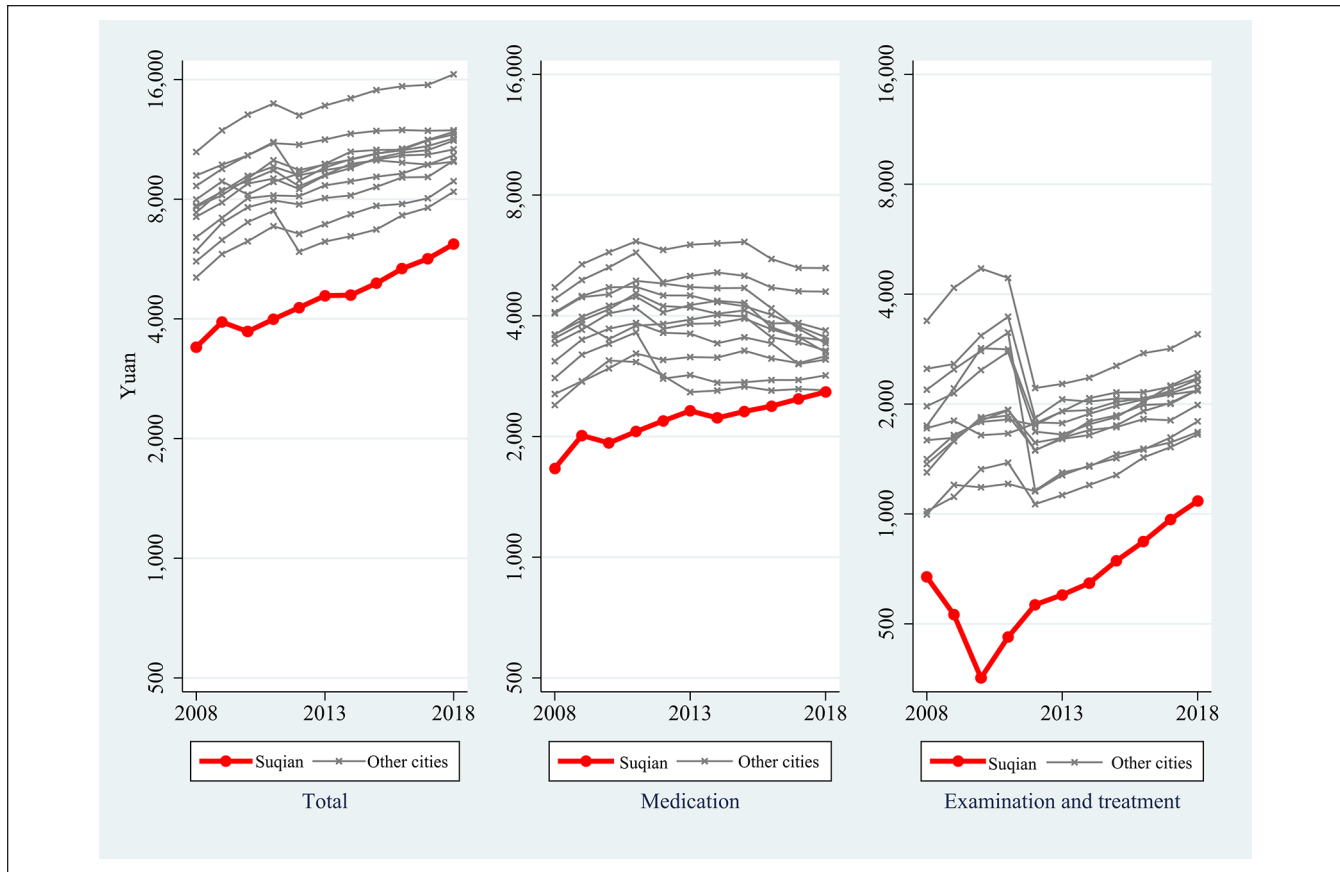


Figure 5. Inpatient expenditures per visit, 2008 to 2018.

Table 4. Regression Results for Expenditure Measures.

	Outpatient expense per visit (yuan)			Inpatient expense per visit (yuan)		
	(1)	(2)	(3)	(4)	(5)	(6)
	Total	Medication	Examination and treatment	Total	Medication	Examination and treatment
Suqian × Post	-13.17 (-1.89)*	-3.155 (-0.68)	-2.543 (-1.34)	-922.8 (-5.46)***	60.94 (0.55)	-451.7 (-5.19)***
Control variables	Y	Y	Y	Y	Y	Y
N	143	143	143	143	143	143
R ²	0.880	0.831	0.850	0.908	0.658	0.437

Note. The control variables are number of hospital beds per 1000 population, number of medical staff per 1000 population, GDP per capita (yuan, thousands), population (thousands), Engel coefficient of rural households (%), year fixed effect, and city fixed effect. *T* statistics are reported in parentheses.

Significance level at * $P < .10$. ** $P < .05$. *** $P < .01$.

financially, which has achieved the designated target. When the subsidy to hospitals was eliminated, the government's financial burden was reduced, and it could concentrate on its resources and efforts on preventive care and insurance coverage. Overall, Suqian's system requires less public funding and has performed as well as comparable public systems, or even better in some aspects. Economic growth has slowed in

recent years all over the country, and the growth of public revenue is limited. After a long period of increased public spending, the government faces great pressure on medical expenditures. From this perspective, other regions in China may draw lessons from Suqian's experience. In addition, its experience also provides a potential model for other developing countries that try to reform their public hospital systems.

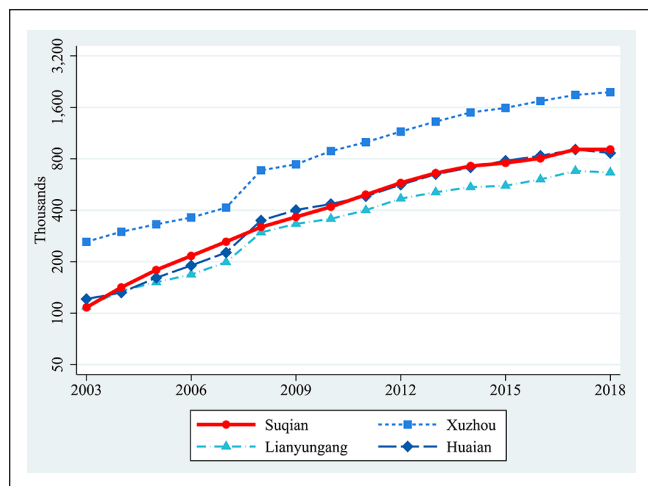


Figure 6. Number of inpatient admissions in Suqian and nearby cities, 2003 to 2018.

It is worth to mention that Suqian has started building new public hospitals in recent years. For example, the Suqian First Renmin Hospital was built in September 2015, with a total investment of 2.1 billion RMB.⁴³ The reasons for building this large-scale, comprehensive public hospital are complex. It is argued that the main reason is that the provincial government has continued to provide subsidies to local health care systems in other cities. As the system in Suqian is privatized, it was not able to receive the subsidy. Therefore, for reasons of equity, the local government needs a public hospital to receive the benefit. In January 2019, the local government announced that more public health centers will be constructed in rural areas.⁴⁴ In the figures illustrated above, the patterns have been stable in Suqian after 2015, though it is uncertain how these changes may affect the system in the future.

Conclusions

The evidence suggests that Suqian's privatized health care delivery system performs equally well as other cities in terms of changes in number of inpatient admissions and average inpatient days and even better for mortality rate in emergency rooms. Over a long period of time, Suqian has maintained the lowest per visit expenditures on outpatient and inpatient services. The results of this study should alleviate policy makers' concerns about private delivery. This work not only contributes to the academic literature, but also is of great policy relevance for China's health care reform as well as health care reform in other developing countries. As the privatized system in Suqian requires less government funding, the policy recommendation is that other places may draw lessons from Suqian and encourage private investment in the health care sector or, at least, reduce the barriers for private facilities and provide a fair market for public and private hospitals to compete.

Due to data constraint, this research is still subject to some limitations. The first is that it only shows evidence on a limited number of measures, such as average inpatient days and expenditures, and some measures only have data for a limited number of years. These measures are not sufficient enough for a full assessment of the health care system concerning health outcomes and quality. For example, we could not directly observe how many patients have sought care outside of their area of residence. Data were not available for quality measures such as readmission rates, population health conditions, and patient satisfactions. A well-functioning system should have high accessibility, low costs, and high quality. These features are worth investigating in future research. Due to the lack of patient level data, this study is also limited in terms of empirical evidence on the mechanisms through which hospital ownership may or may not matter to the medical costs and health outcomes.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the National Natural Science Foundation of China (71503014), the research seed fund of the School of Economics in Peking University and the China Medical Board.

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