

Healthcare beds equity 2000-2017, the 2009 reform, and COVID-19 in China

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Introduction

Since 1978, China transitioned from the government planned economy to the market economy, with the healthcare system privatized. The transformation gave rise to huge problems. One of the daunting challenges was health inequities between rural and urban areas and across income quartiles (Tang et al., 2008). Two main explanations were the comparative low level of the government funding, and huge disparities of local public finance to healthcare (Yip & Hsiao, 2009).

Seeing this, in 2009, China launched a huge and complex health system reform, with massive funding injected to the healthcare sector (Yip et al., 2012). However, it is a challenge to ensure the reform can improve equity, as local finance still accounts for 70% of total government healthcare expenditures. The principle of equity begins with ensuring people equal access opportunity to needed healthcare resources (Braveman, 2006). But this supply-side evidence in China is lacking. This study aims to evaluate the impact of the 2009 reform on healthcare resources equity across counties in China.

Methods

Data and Variables Data of healthcare facilities beds, as well as covariates, including population, industry production, saving deposit, and public revenue at the county level are obtained from China County/City Statistical Yearbooks, 2001-2018.

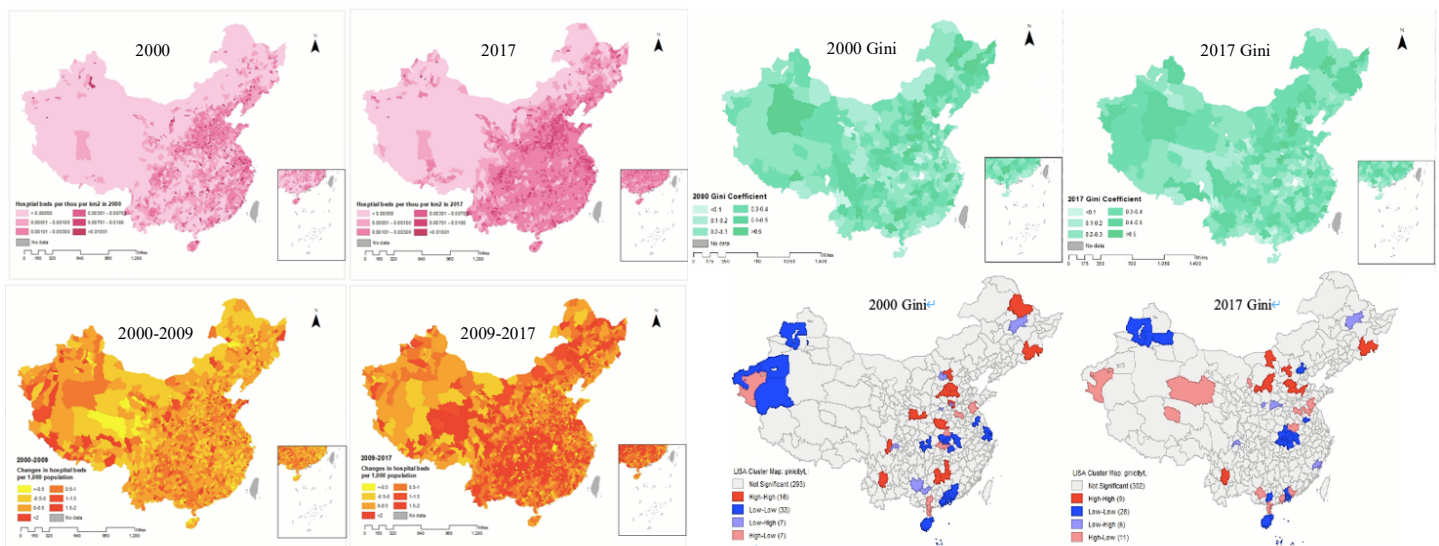
Aim 1 Trends and patterns of equity Baumol's Conditional Convergence model is adopted to test β -convergence (Baumol, 1986). Spatial autocorrelation is evaluated by global and local Moran's I.

Aim 2 The impact of 2009 healthcare reform on equity Interrupted time series models are used to evaluate the trend changes in equity. Following Jayachandran et al. (2010), a formal test of trend breaks in healthcare beds equity time series is conducted.

Aim 3 Equity on COVID-19 mortality Spatial error model is adopted if the spatial pattern is present.

Discussions

Figure 1 Patterns of healthcare beds distribution and its Gini coefficients in China (2000-2017)



The healthcare resources in China were at a relatively low level in the beginning of 2000s. Since 2006, the resources grew rapidly, largely the result of economic growth. Meanwhile, a dynamic convergence phenomenon was found: poorly resourced counties improved beds per capita more rapidly and partially caught up with better resourced counties. On the national level, the healthcare resources equity also witnessed improvements from 2000 to 2017.

However, the uneven geographical distribution persists. The national Gini coefficient is as high as 0.7113 in 2017. Healthcare resources are mainly concentrated in the eastern region, and the difference between the eastern and western regions is gradually increasing. The spatial aggregations of the beds and the relative change distributions continue to exist from 2000 to 2017. Within regions, the inequities also exist. The western China has the highest Gini coefficient as of 2017, which presents an increasing trend.

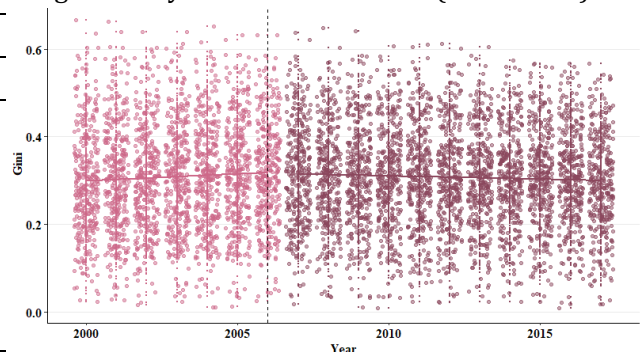
Results show that after the reform, the equities improved, which proved that the increased government role can promote healthcare equity. Two channels work in this process: the government versus market, and the local versus central government financing. At the city level, where the local (county) finances are usually similar, the decentralization may not have large negative impacts on equity. Meanwhile, as indicated by the Tiebout model, at the local level by cities and towns, competition will naturally arise because individuals can vote with their feet. In this case, it is reasonable to hypothesize that the city-level inequities are mainly driven by the proportion of overall government finance to the total healthcare expenditure. As expected, this study finds that at the city level, the equities improved after the reform, as the government invested much in the healthcare sector. However, at the provincial level, the equity concerns of the decentralization may matter. If the financial transfers for healthcare from the central government to poor regions are not sufficient, the total government healthcare expenditure in these regions may be far less than abundant counterparts. So, resources equity may deteriorate further, as shown in Table 1.

Table 1 ITS results for Gini coefficients (2006)

	City level		Province level	
	Crude	Adjusted	Crude	Adjusted
Year	0.003 (0.001)*	0.003 (0.001)*	0.004 (0.006)*	0.001 (0.005)*
Post	9.321 (3.173)**	8.337 (3.144)**	11.600 (13.063)*	-5.925 (10.445)*
Post*Year	-0.005 (0.002)**	-0.004 (0.002)**	-0.006 (0.007)*	0.003 (0.005)*

Notes: Newey-west SE in parentheses. *** at 0.1% significance level; ** 1%; * 5%

Figure 2 City level Gini Coefficient (2000-2017)



This study confirms that the increased government functions in the healthcare sector can promote equity, using China as an example. Moreover, the study finds that important roles of the governance structure. Specifically, if the government finance for health is mainly at the local level, the equity concerns of decentralization should be considered. Countries should think carefully about how to strike a balance between government and market arrangements, the central and local government financing, as well as the equity and efficiency considerations in the healthcare sector.

The study does not find significant results of resource equity impacts on COVID-19 mortality.