



THOUGHT LEADERSHIP BRIEF

Impact of Medical Litigation on Diagnostic Tests in Hospitals: Evidence from China

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KEY POINTS

- ▶ In China, medical litigation against hospitals due to malpractice has been increasing year by year. This potential medical liability risk has led hospitals and physicians to adopt various defensive medicine practices, one of which is over-testing.
- ▶ Medical litigation results in a significant decline in the positive rate of magnetic resonance imaging (MRI) tests, a reduction driven by the increase in negative cases.
- ▶ We find significant heterogeneity in how hospitals respond to court rulings. Losing hospitals exhibited more pronounced over-testing practices than their winning counterparts.
- ▶ The annual cost of additional MRI tests resulting from losing a lawsuit amounts to approximately 1.21 billion USD nationwide.

ISSUE

The medical malpractice liability system provides compensation for patients who have suffered harm due to negligence and incentivizes physicians to provide appropriate treatment plans for their patients. However, punitive measures against physicians or other healthcare providers can drive them to practice excessive caution and implement preventive treatments with minimal medical benefit for the patients, "defensive medicine."

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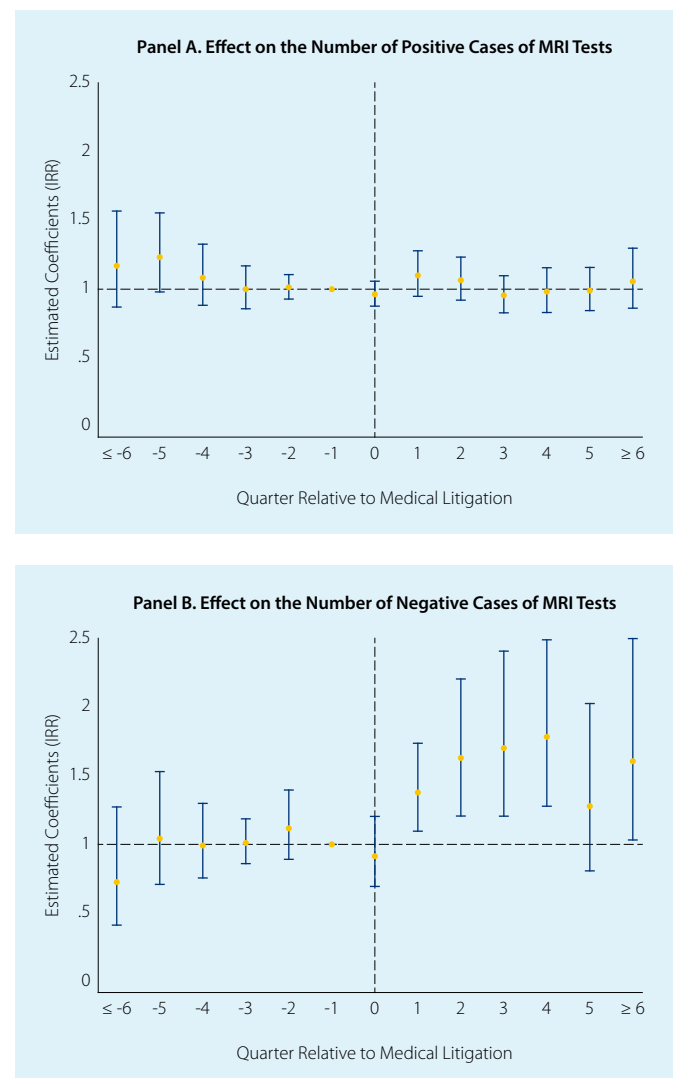
Regions with frequent medical malpractice and inadequate medical liability systems are often found in developing countries, where they face various challenges, including population growth, a severe shortage of healthcare resources, health inequality, and tense doctor-patient relationships. As the world's most populous developing country, China's healthcare system has long faced challenges in accessibility, quality and efficiency of care. Uneven distribution of healthcare resources and severe information asymmetry between healthcare providers and patients have led to a lack of trust and high tension between physicians and patients. Data from the China Judgments Online platform shows that the number of civil lawsuits related to medical malpractice liability disputes increased from 53 cases in 2009 to 26,331 cases in 2019, reaching the highest level in nearly 20 years.

ASSESSMENT

In this study, we explore the effects of medical litigation on diagnostic testing behaviors in Chinese hospitals. The analysis leverages hospital quarterly reports and civil lawsuits regarding medical damage liability disputes in Shenzhen. A primary challenge in identification is the endogeneity of medical litigation. For example, the occurrence of medical malpractice among different healthcare providers and patients' decision to file a lawsuit might be correlated with unobserved characteristics of both the healthcare providers and the patients, leading to omitted variable bias. We address this concern in several ways. First, we compare various time-invariant characteristics between hospitals with and without medical litigation and control for the interaction terms between these characteristics and a linear time trend. Additionally, we examine whether the timing and outcomes of court verdicts are correlated with hospital characteristics. Reassuringly, we find no significant correlation between court verdicts and hospital characteristics. Secondly, we use hospitals being sued but facing different verdicts (i.e., won or lost) as control and treatment groups, respectively, to investigate further the impact of losing litigation on hospitals' diagnostic testing outcomes. This allows us to utilize the quasi-randomness of the court verdicts and compare marginal winners and marginal losers with more similar characteristics. Thirdly, we use the event study framework for each of our results and show that there is no significant trend difference between the treatment and control hospitals prior to the court verdict.

We first examine the effects of medical litigation on hospitals' diagnostic testing outcomes, including X-ray, computed tomography (CT) and MRI tests. We find that, on average, medical litigation results in a significant reduction in the positive rate of MRI test by 3.4 percentage points, and this reduction is mainly driven by the increase in negative cases. Specifically, after the litigation, the number of cases tested negative rose by a remarkable 36.2% (Figure 1). In contrast, we do not find any significant change in the number of positive cases. No significant effects are found for cheaper and more commonly prescribed X-ray and CT scans.

Figure 1. Effects of Medical Litigation on Positive and Negative Cases of MRI Tests.

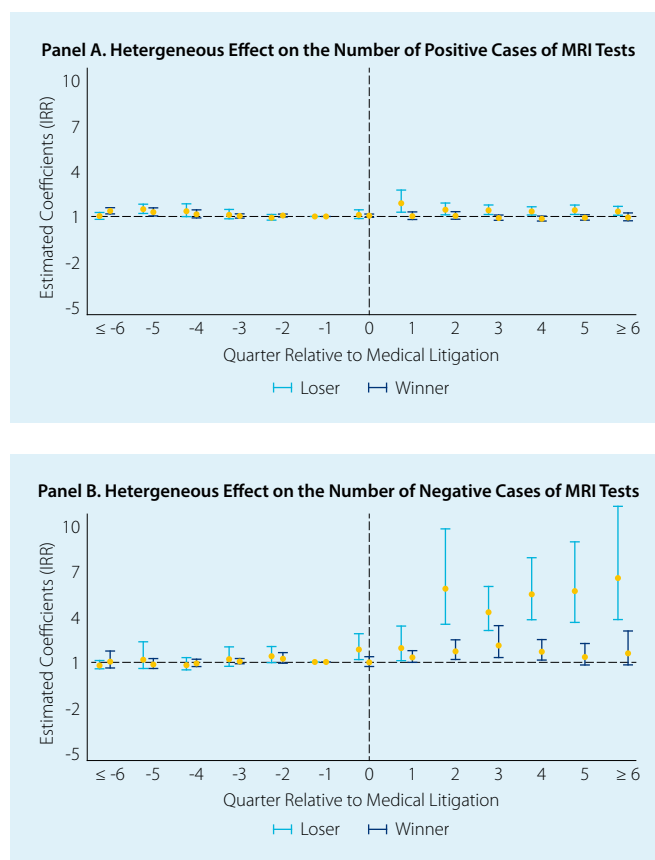


Note: Panel A and B plot the event study estimates using Poisson regression for positive and negative cases of MRI tests, respectively. The estimated coefficients are reported in the form of Incidence Rate Ratios (IRRs).

To better understand whether winning or losing the litigation makes a difference to hospitals' responses, we further explore the heterogeneity by court verdict. We divided the hospitals being sued into two groups, "winners" and "losers", based on their obligation to pay court fees and compared the effects of winning and losing a lawsuit on the hospital's diagnostic testing outcomes. We observe that the effects in negative cases are much greater than that in positive cases (Figure 2). The results also show that losing hospitals respond more significantly than their winning counterparts. Specifically, the number of negative cases of MRI tests at losing hospitals has significantly increased by 80.9%, while there is no significant effect on negative cases in winning hospitals.

Further utilizing information on economic compensation paid by the losing hospital and the proportion of medical malpractice liability the hospital bears, we conduct a generalized difference-in-difference estimation and find that after losing a litigation, for every 10,000 Chinese yuan (approximately 1377.09 USD) of compensation a hospital bears, there is an increase of 18.3 MRI scans per quarter. Similarly, for every 1 percentage point increase in the proportion of medical errors that the court finds the hospital liable for, the hospital would have 13.0 additional MRI scans per quarter (Table 1). Similarly, we observe a larger percentage increase in negative cases compared to positive cases.

Figure 2. Heterogeneous Effect of Medical Litigation on Positive and Negative Cases of MRI Tests by Court Rulings.



Note: Panel A and B plot the event study estimates using Poisson regression for positive and negative cases of MRI tests by court rulings. The estimated coefficients are reported in the form of Incidence Rate Ratios (IRRs). Winners and losers of the litigation are defined by the obligations to pay court fees, with those who pay more being the losing party.

Table 1. Hospital Response to Financial Punishment and Malpractice.

	MRI Tests			
	Volume (1)	Positive Rate (2)	Positive Cases (3)	Negative Cases (4)
Panel A. Claim fee as treatment intensity				
Claim fee (10,000 CNY) × Post	18.301*** (0.105)	-0.184*** (0.005)	71.344*** (0.186)	28.575*** (0.029)
Mean of Dep. Var	3012.736	88.410	3292.090	300.459
R-squared	0.994	0.892	0.954	0.954
Panel B. Medical error as treatment intensity				
Medical error (Percentage points) × Post	13.040*** (0.075)	-0.131*** (0.003)	50.834*** (0.132)	20.361*** (0.021)
Mean of Dep. Var	3012.736	88.410	3292.090	300.459
R-squared	0.994	0.892	0.954	0.954
Number of clusters	21	21	21	21
Observations	206	206	206	206

Notes: All models include hospital and district by year fixed effects, treatment-specific linear time trends and interaction terms between hospital basic characteristics (i.e., government-owned hospital, general hospital, land area, number of beds, employee, physicians, nurses, chief physicians, associate chief physician, and attending physician) and a linear time trend. Robust standard errors clustered at the hospital level are presented in parentheses. Significance at * 10%, ** 5%, and *** 1% levels.

Finally, we conduct a back-of-the-envelope calculation to quantify the underlying costs of hospitals' defensive medicine practices. Specifically, we focus on hospitals' ordering of MRI scans as a result of losing a litigation case. The results suggest that the annual cost of additional MRI scans resulting from losing a litigation is 8.74 billion Chinese yuan or 1.21 billion USD nationwide.

RECOMMENDATIONS

Our findings have several implications for policy issues regarding the development and reform of the medical malpractice liability system in both developing and developed countries. First, our results show that medical malpractice litigation leads to hospitals engaging in defensive medicine practices, specifically excessive diagnostic testing, where the magnitude of the impact is greater than existing evidence from developed countries. Considering that most developing countries are facing challenges from inadequate or uneven distribution of healthcare resources, defensive medicine practices further exacerbate the pressure on their healthcare system. Implementation of measures such as caps on noneconomic damages, as seen in the United States, may serve as a valuable reference solution.

Second, our findings also have implications for the ongoing policy discussions in developed countries. For instance, recent proposals suggest that the primary focus of liability can be shifted from individual practitioners to larger organizations such as hospitals or accountable care organizations. By imposing enterprise liability, we can decrease the medical liability risk faced by individual physicians and consequently reduce the occurrence of defensive medicine practices. However, our results indicate that even when the medical institution bears most of the liability risk, defensive medicine practices is still considerable. Future policymaking needs to consider regulating the responsibility sharing between the organization (healthcare institutions) and individual practitioners.



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