Fear and Risk Perception: Understanding Physicians' Dynamic Responses to Malpractice Lawsuits*

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August 1, 2025

Abstract

This paper investigates how physicians adjust their clinical decision-making following medical malpractice lawsuits and how these responses are driven by mental rather than financial costs, and do not align with rational expectations. We combine a comprehensive health insurance claim database from a Chinese city with the universe of malpractice lawsuits to study changes in physician behavior and patient outcomes. We find that physicians respond to lawsuits by practicing more conservatively, rejecting high-risk patients, reducing surgery rates, and increasing the use of diagnostic tests and traditional Chinese medicine. These changes are associated with worse patient outcomes, consistent with defensive medicine. The effects are not limited to the directly involved departments but spill over to other departments within the same hospital. In addition, the changes are short-lived, with physicians reverting to their pre-lawsuit treatment patterns in eight weeks. We provide evidence that such responses are likely driven by mental cost (including fear) and deviate from rational expectations. First, physicians in hospitals with more and less frequent lawsuits exhibit similar responses to a new lawsuit; moreover, they respond similarly to winning and losing cases. Second, physicians' reactions to a patient's death vary depending on the recency of a salient lawsuit. Lastly, physician responses are especially strong following criminal violence against physicians, which is emotionally and psychologically salient.

Keywords: physician behavior; medical malpractice; defensive medicine; mental cost; short memory; salience.

JEL Codes: I11, I12, P36.

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*We thank Haizhen Lin, Luca Maini, Dan Sacks, and participants at seminars and conferences at Harvard Medical School, Indiana University, the International Industrial Organization Conference, the John Morgan Penn State Alumni Conference, and Peking University for their useful comments. Li gratefully acknowledges the National Natural Science Foundation of China (Nos. 72403216 and 72192804), the Guangdong Basic and Applied Basic Research Foundation (No. 2022B1515120060), and the Research Fund of the School of Management and Economics, Chinese University of Hong Kong, Shenzhen, for financial support. All remaining errors are our own.

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1 Introduction

Physicians play an important role in both the quality and cost of healthcare. They routinely make decisions under uncertainty, balancing treatment risks, patient outcomes, and potential malpractice liability. Classical decision theory assumes that such choices are guided by rational expectations. However, infrequent and emotionally charged events, such as medical malpractice lawsuits, can distort perceptions about the risk of malpractice lawsuits in ways that deviate from rational expectations and alter clinical behavior and patient outcomes.

This paper investigates how physicians adjust their treatment decisions after malpractice lawsuits filed against themselves or their colleagues and whether these adjustments are consistent with rational expectations. Understanding physicians' behavioral responses is crucial, as they directly affect both patient welfare and healthcare spending. If litigation exposure leads physicians to correct previous medical errors, the resulting changes can improve efficiency and benefit patients. In contrast, if the response reflects an increased perception of the risk of litigation and leads to defensive medicine, where care is chosen to reduce legal risk rather than to benefit the patient, it can introduce inefficiencies and harm patient welfare. In addition, it is also important to assess whether these adjustments align with rational expectations. If distorted beliefs about malpractice lawsuit risk lead to even more defensive medicine than would occur under rational expectations, physicians' overreaction may exacerbate welfare losses. In such cases, policy should aim not only to curb defensive medicine, but also to correct the misperception about the litigation risk.

Our empirical setting is medical malpractice lawsuits involving departments in public hospitals in a Chinese city. This setting is helpful because we can link the universe of health insurance inpatient claims with the full set of medical malpractice lawsuits in the area. In addition, Chinese physicians are employed by specific hospital departments and rarely engage in dual practice. This institutional feature allows us to clearly define a physician's colleagues as those within the same hospital, allowing the study of spillover effects from malpractice lawsuits.

Our analysis focuses on the 64 malpractice lawsuits filed against various departments in 12 out of 28 hospitals between 2014 and 2018. We leverage the temporal and geographical variation in exposure to malpractice lawsuits to study the causal impact of malpractice lawsuits on physician behavior. The identification exploits the quasi-random timing of malpractice lawsuits. The timing is unpredictable in the sense that negligence only occasionally leads to lawsuits (Localio et al., 1991) and medically correct care can be subject to lawsuits (Studdert et al., 2006). We analyze changes within the hospital in care utilization and patient outcomes after exposure to a lawsuit. To control for aggregate time trends, we compare these within-hospital changes to changes among patients in the control hospitals that did not experience a lawsuit within the event time window, using a stacked difference-in-differences (DID) design. Our primary specification includes hospital fixed effects, case-specific time fixed effects, and rich patient demographics and risk factors to account for potential confounders.

To isolate the response from the physician side, we focus on the event timing when the plaintiff initiated the first review of the medical record, which serves as a precursor of malpractice lawsuits.

After this date, information on the lawsuit remains unavailable to the public for at least three months in our data. Therefore, we select a 120-day time window surrounding the event date to avoid the potential influence of malpractice lawsuits on patients and physicians in the control group.

We find robust evidence that physicians in the same hospital behaved more conservatively after a lawsuit against a certain department in this hospital, both at the extensive margin and the intensive margin. In the extensive margin, we find that referrals to the litigant hospital dropped by 11 percent, while the volume of high-risk patients decreased by 11 percent. Since these effects occurred during a period when the general public was not yet aware of the lawsuit, the findings likely reflect a supply-side response, specifically, that hospitals may reject admissions for riskier patients. In the intensive margin, the surgery rate decreased by 6 percent. The ratio of spending on Chinese medicine, which is considered a conservative way of being neither risky nor effective (Nature, 2007), over the total expenditure increased by 3 percent. In addition, the ratio of spending on diagnostic exams rose by 14 percent. Since the increases in the spending on diagnostic exams and traditional Chinese medicine were almost offset by the decrease in the spending on surgery, the total average spending per patient visit increased only modestly.[1] These changes did not appear to represent high-value care or prioritize patient outcomes, as health outcomes worsened slightly, evidenced by an increase in the 30-day readmission rate. Overall, the findings are consistent with the notion of defensive medicine.

The event study results further indicate that such effects are short-lived, steadily returning to the pre-lawsuit practices within eight weeks. This transient response supports the interpretation that physicians temporarily adjust their perceived lawsuit risk, upward following a lawsuit and downward in the absence of future lawsuits, rather than making a deliberate effort to correct medical errors, which would likely result in more sustained changes in their practice and improved patient outcomes.

Additional analyses further support the interpretation that physicians responded to lawsuits by practicing defensive medicine as a result of the greater perceived risk of lawsuits, while providing evidence against alternative explanations such as efforts to correct medical errors, hospital-wide protocol changes, or staffing shortages.

First, we find a significant spillover effect: although the responses from the litigant departments drive the results, other departments within the same hospital also adjust their behavior significantly, albeit to a lesser extent. If physicians were only correcting errors in their subsequent practice, we would not expect to see responses from physicians in unrelated departments. Likewise, if the litigant department faced staff shortages due to legal proceedings, other departments, especially those with low specialty similarity and limited ability to share medical personnel, should not have exhibited a response. Furthermore, the spillover effect is unlikely to imply a pure hospital-wide protocol change, as departments more similar to the litigant one, in terms of patient populations, physician training, and medical equipment, demonstrate a stronger response than the general hospital-wide response. In general, the spillover effects suggest that the impact of malpractice lawsuits extends

[1] For some specialties featuring non-surgical treatments, e.g., internal medicine, the average spending increased significantly.

beyond directly involved physicians, influencing medical decision making and patient outcomes across specialties. This highlights the need for system-wide strategies to address defensive medicine.

Second, we find that physicians' responses to lawsuits did not significantly differ depending on whether the plaintiffs (i.e., the patients or their families) won or lost the lawsuits. If physicians' behavioral responses were motivated by correcting errors, we would expect stronger changes after cases won by the plaintiffs, as these likely involved clearer evidence of physician errors.

Third, we directly test whether physicians tailor their responses to the specific type of medical error alleged in the lawsuit, such as inadequate treatment, missed diagnoses, or surgical failures. Under the error-correction hypothesis, we would expect targeted changes; for example, fewer surgeries after surgical failure allegations or increased diagnostic tests after claims of missed diagnoses. However, we find minimal variation in responses across these categories, further suggesting that physician behavior reflects defensive medicine rather than efforts to address specific past mistakes.

Having established that physicians adjust their perceived risk of litigation and corresponding defensive practices in response to lawsuits, we next examine whether this updating process is fully rational. Our test is based on the premise that if physicians recall everything perfectly and update their beliefs in a fully Bayesian manner, hospitals with more historical malpractice lawsuits should exhibit smaller responses to the new lawsuit. In extreme, witnessing a lawsuit may not provide new information in hospitals with extensive prior exposure, as physicians there already have sufficient direct or indirect evidence to incorporate in their expectations of the risk of a lawsuit (Jena et al., 2011). Consequently, under rational expectation framework, these experienced hospitals do not respond or adjust only modestly. In contrast, for hospitals with little previous experience, a new lawsuit provides ample information and we would expect a much larger response under a rational expectations framework.

We find that hospitals with high and low volumes of historical lawsuits exhibit similar responses, a pattern inconsistent with the rational expectations framework. Instead, this finding aligns with a short-memory learning model in which physicians place greater weight on recent events when updating their beliefs about the risk of a lawsuit. Because physicians discount or forget historical information, the new lawsuit provides a similar amount of information in both experienced and inexperienced hospitals. Alternatively, this pattern can be understood through a salience mechanism: emotionally charged events, such as lawsuits, capture attention and prompt overreactions even if the actual risk remains unchanged (Bordalo, Gennaioli, and Shleifer, 2022). As the salience fades, the treatment patterns return to their pre-lawsuit state. Both the short-memory learning model and the salience framework share the feature of bounded rationality, with the former effectively operating as a salience mechanism in which recency confers salience.

We present additional evidence against rational expectations. The death of a patient without a resulting lawsuit elicits a weaker defensive response than a lawsuit, but only when there have been no recent lawsuits at the hospital. In contrast, the same event prompts more aggressive treatment decisions when it follows a recent lawsuit. Thus, physicians' reactions to a patient's death depend on the recency of past lawsuits. This asymmetry can be explained by short memory learning or salience: When there is a recent lawsuit, physicians initially overreact to the lawsuit and subsequently overreact to the perceived "good" news of no lawsuit, despite the occurrence of a patient's death. In contrast, in a fully rational framework, the timing of previous lawsuits would not matter; Physician responses depend only on the cumulative number of lawsuits, not their recency.

Lastly, we find that physician responses are much larger in a case involving criminal violence. Such cases are emotionally and psychologically striking, making them highly salient events.

This paper relates to the literature on physicians' responses to malpractice litigation. Most papers study whether the practice of defensive medicine is affected by state-level malpractice tort reforms (Avraham and Schanzenbach, 2015; Kessler and McClellan, 1996, 2002; Currie and MacLeod, 2008) or malpractice insurance premiums (Dubay, Kaestner, and Waidmann, 1999), although these reforms may not be salient to physicians (Carrier et al., 2010). Frakes and Gruber (2019) finds evidence of defensive medicine by exploiting military immunity to the malpractice lawsuit. In contrast, this paper examines physicians' responses to direct malpractice lawsuits.

The most closely related papers include Dranove and Watanabe (2010) and Shurtz (2013), both of which focus on the impact of medical malpractice lawsuits on C-section rates among obstetricians in Florida, and Carroll, Cutler, and Jena (2021), which examines the responses of emergency department physicians to malpractice lawsuits filed directly against them, also using Florida data.

We contribute to this literature by exploring mental costs as a key driver for physician responses to medical malpractice lawsuits and presenting evidence against the rational expectation framework. In addition, we present strong evidence of defensive medicine in the context of a developing country, China, where institutional characteristics sharply limit pecuniary penalties, but expose physicians to substantial psychological or mental costs (see Section 2). Our findings point to the importance of mental cost as the main driving force of changes in physician behavior after malpractice lawsuits. Our finding that non-pecuniary mental burdens alone can induce defensive medicine practices has several policy implications. First, tort reforms, which primarily target financial liability, may have a limited effect in curbing defensive medicine practices; in fact, the leniency in the financial penalty against medical malpractice could provoke some patients to express dissatisfaction through threats or violence, amplifying the distress of the physician and strengthening defensive practices. Second, it is important to provide additional mental support to physicians and help them cope with the mental stress associated with malpractice lawsuits. Defensive medicine practices driven by non-pecuniary factors also have broader implications for physician moral hazard: Since malpractice insurance only covers financial damages, it will not completely stem the defensive medicine practices motivated by non-pecuniary factors such as mental stress. Our findings point to a new set of policy considerations, such as mental health support for physicians, to address the root causes of defensive medicine.

In terms of empirical methodology, our paper is similar to both Shurtz (2013) and Carroll, Cutler, and Jena (2021) in that we all used DID strategies. However, a key difference is in the choice of the control group: as we documented a hospital-wide spillover effect in our setting, we remove the litigant physicians' colleagues from the control group. To the extent that similar spillover effects across physicians within the same hospital also exist in the US setting, our result suggests a more influential role of malpractice lawsuits on physician behaviors and patient outcomes across different specialties than those found by these authors.

Identifying irrational fears as a primary mechanism for defensive medicine practices is a novel contribution to the literature on the changes in physician behavior following malpractice lawsuits. In this regard, our findings provide empirical support for theoretical work on the role of salience and attention in decision-making (Bordalo, Gennaioli, and Shleifer, 2020; Bordalo et al., 2024). It also aligns with other empirical evidence showing that forecasts tend to deviate from the standard of full information and rational expectations (Gennaioli, Ma, and Shleifer, 2016; Bordalo et al., 2019; Bianchi, Ludvigson, and Ma, 2022). These studies emphasize belief formation based on representativeness heuristics or judgmental biases, often leading to overreaction and subsequent reversal. Our results also echo the findings on overreaction to rare events, such as natural disasters, which are made more salient (Kunreuther et al., 1978; Gallagher, 2014; Dessaint and Matray, 2017). For example, Dessaint and Matray (2017) show that nearby hurricanes prompt managers to increase cash holdings drastically despite the unchanged risk, with cash holding levels reverting once the prominence of the risk subsides. Similarly. Kunreuther et al. (1978) documents a surge in flood insurance purchases after a flood, but the effect is temporary.

This paper also contributes to the literature on physician behavior and non-Bayesian decision making. Sarsons (2017) shows that primary care physicians change referral patterns in response to surgeons' failed surgeries by learning about surgeons' skills in a non-Bayesian way. Singh (2021) finds that obstetricians resort to heuristics in response to previous treatment failures. We extend this line of work by examining how physicians react to malpractice lawsuits and provide evidence that their behavior is primarily driven by irrational expectation.

The remainder of the paper is organized as follows. In Section 2, we describe the institutional background of medical malpractice lawsuits in China; in Section 3, we present a theoretical framework on physicians' responses to malpractice lawsuits, distinguishing rational learning and salience; in Section 4, we describe the data and present descriptive statistics; in Section 5, we describe our empirical strategy; in Section 6, we present our results on physician responses; in Section 7, we present robustness checks; and finally in Section 8, we conclude.

2 Institutional Background

2.1 Medical Lawsuit and Settlement

Medical litigation occurs when patients (or individuals representing patients) and hospitals face significant disagreement on patients' adverse outcomes, either death or severe disability. There is usually a long period of time from patient care to the malpractice lawsuit, which involves many uncertainties. Figure 1 summarizes the timeline of typical medical malpractice lawsuits in China, from patient injury to case resolution. The process begins with an adverse outcome for the patient, either a serious injury or death. Not all instances of patient injury result in malpractice lawsuits. Most patients may not attribute their injuries to medical negligence/error, or may choose not to pursue legal action against physicians (Localio et al., 1991). Most disputes between doctors and patients are settled privately and peacefully. Even if the injury eventually leads to a lawsuit, it takes some time for physicians to know that they will be involved in the lawsuit. First, physicians will only learn about the injury when the patient is disabled or dies, usually a while after discharge. Second, the patient will only resort to a lawsuit if the dispute cannot be settled privately in peace.

[Figure 1 about here]

Instead of suing a specific physician, patients typically file a lawsuit against the physician's department within a hospital, as medical care is generally delivered by a team. To initiate a lawsuit, the court first requires patients to obtain a review from a third-party medical expert. These third-party organizations must be officially authorized by the court and their evaluations serve as key evidence and reference points for judicial decisions. To perform the review, both parties must be notified and involved in the process. The receipt of this notification marks the first time that the hospital and the physicians are officially informed that they are involved in a lawsuit.[2] Following the first expert review, the patient may choose to formally file a case in the local court, which subsequently schedules the trial. In our data, it takes an average of five months from the time of patient injury to the first expert review and at least an additional two months from the first expert review to the public trial.

Based on this timeline, we restrict the event time window to 120 days surrounding the date when the patient applied for their *first* expert review. This is because the expert review notification serves as the first definitive signal that the department is involved in a lawsuit. In addition, between the first expert review and the public trial (a period of at least two months), information about the lawsuit remains unknown to the hospital that is being sued. Since the general public is unaware of the legal proceedings during this time, any observed responses can be attributed to the supply side. In addition, physicians in other hospitals remain uninformed and unaffected by the lawsuit, serving as a natural control group.

2.2 Medical Lawsuits as a Salient Shock to Providers

In this subsection, we explain why malpractice lawsuits are salient events for physicians and highlight how the Chinese context uniquely emphasizes the psychological/mental costs of such lawsuits on physicians.

Medical malpractice lawsuits remain a serious concern for physicians. By age 65, 75% of physicians in low-risk specialties and 99% in high-risk specialties are projected to face at least one claim in the U.S. (Jena et al., 2011). However, direct exposure to litigation is relatively infrequent. Even in the U.S. which has one of the highest rates of medical malpractice lawsuits globally, 84% of physicians incurred only one malpractice claim over a recent 10-year period (Studdert et al., 2016).

A non-trivial portion of the burden associated with malpractice lawsuits stems from mental suffering. In the U.S., most physicians are not financially liable for malpractice damages (Zeiler et al., 2007). The primary costs of being sued for malpractice are the reputation effects and

[2] Patients or hospitals may request additional expert reviews if they dispute the initial findings.

the anxiety related to litigation (Schwenk, 2014; Carroll, Cutler, and Jena, 2021). In addition, physicians have been shown to be affected by the time spent and the amount of conflict involved in defending against a claim (Kessler and McClellan, 1996).

Such infrequent but emotionally charged events are typically highly salient, standing out and capturing attention. In behavioral economics, such events are especially likely to be overweight in decision making, despite their low statistical likelihood (Bordalo, Gennaioli, and Shleifer, 2022).

China provides a setting that further limits the scope of pecuniary penalties while exposing physicians named in malpractice lawsuits to substantial psychological costs, offering a unique opportunity to identify provider responses driven by non-pecuniary channels.

First, the financial cost of the medical malpractice suit against physicians is minimal. Even if they were to lose a lawsuit, individual physicians are barely financially liable. In our sample, the *maximum* damage award accounts only for 0.004% of the average hospital annual revenue and is equivalent to just 33% of *average* damage award in the U.S. Importantly, in most cases the hospital department where the physician is employed, as a whole, is the defendant, and liability is not traced to individual physicians.[3] Furthermore, from a career perspective, lawsuits appear to have no negative impact: our interviews with hospitals reveal no evidence that being sued affects promotion.[4]

In addition to modest insured costs, hospitals are unlikely to face uninsured losses such as reduced patient volume following potentially harmed reputation after a medical malpractice lawsuit, as a result of China's hospital-centric healthcare system (Yip and Hsiao, 2014). Indeed, consistent with this, we do not find a significant change in patient volume after lawsuits, as shown later in Table B2.

In contrast, physicians bear substantial mental costs during medical malpractice lawsuits. When disputes escalate, patients and their families often express anger through verbal and sometimes physical violence against healthcare providers (Bo et al., 2020). In particular, such violence can occur even when patients are pursuing formal malpractice lawsuits. As in many other developing countries, the legal framework that governs medical accidents and disputes in China tends to understate the liability of the provider and limit the compensation to plaintiffs. For example, Article 49, Chapter 4 of *The Regulation on the Handling of Medical Accidents* stipulates that the pre-existing condition of a patient must be considered when determining compensation.[5] In practice, this regulation often leads to reduced or waived liability for healthcare providers if the injury can be weakly attributed to a pre-existing condition. As a result, plaintiffs frequently receive little compensation even when lawsuits succeed, leading many to resort to informal or violent means to "defend" themselves. An editorial in The Lancet (2012) warned that "China's doctors are in crisis," and The New Yorker documented a vivid case of anti-physician violence in a Chinese hospital (Beam, 2014). Under such threats, physicians experience severe emotional

[3] According to interviews with local hospital administrators, hospitals are covered by malpractice insurance, which pays for any compensation exceeding fifteen thousand dollars.

[4] In one case, a physician found liable in a lawsuit was promoted to chief physician the following year and awarded an "Excellent Worker" designation.

[5] https://www.gov.cn/gongbao/content/2002/content_61445.htm

distress, including insecurity, anxiety, frustration, and even fear.

Our empirical analysis shows that Chinese healthcare providers respond strongly to malpractice lawsuits. This suggests that tort reforms aimed solely at reducing physicians' financial liability may have limited effectiveness in curbing defensive medicine if mental distress is the main driver. On a flip side, it also implies that the concern that malpractice insurance may induce physician moral hazard may be overblown, since the potential psychological stress from malpractice lawsuits alone may be sufficient to sustain high-quality care.

3 A Conceptual Framework

In this section, we present a stylized model in which a physician forms perceptions about two types of risk: (1) adverse patient outcomes; and (2) occurrences of medical lawsuits conditional on adverse patient outcomes. The physician selects a level of care intensity in each period to maximize the utility from treating a patient. We consider two scenarios: one in which physicians update their beliefs as a Bayesian with perfect memory, and another in which they assess risk based on attention to recent and salient events.

3.1 Scenario 1: Physician Learning as a Bayesian

Physicians' Utility Function. In each period, the physician meets a patient of type e, randomly drawn from a Type-I extreme value distribution. The type e determines whether the patient will benefit from a more risky or more conservative medical intervention (see below). After observing the patient's type, the physician then chooses the treatment intensity, denoted by x_t, for the patient to maximizes his/her expected period utility based on the current period beliefs on the probability of the negative shocks:[6]

$$\max_{\{x_t\}} U_t(x_t) = e_t \cdot x_t - C_d \cdot E(D_t|\theta_t(\mathcal{H}_t), x_t) - C_s \cdot E(S_t|\theta_t(\mathcal{H}_t), \gamma_t(\mathcal{H}_t), x_t) + F(x_t),$$

where a higher value of x_t indicates a more aggressive (or riskier) intervention, while a lower value reflects more conservative treatment.[7]

The utility function comprises four parts. First, $e_t x_t$ measures the patient's welfare, i.e., the matching value between the patient's type and the physician's treatment choice. Specifically, $e_t > 0$ corresponds to cases where the patient will be better off with high-risk procedures, and $e_t < 0$ corresponds to cases where the patient will be better off with low-risk procedures. The second and third components measure the physician's expected costs from negative shocks, which are the cost

[6] As we will show in Section 6, we do not find empirical evidence that physicians' treatment choice affects the composition of future patients; as a result, we consider a static model where physicians only maximize the current expected utility from treating a patient.

[7] In our empirical analysis, we will proxy the treatment intensity choice x_t as follows: on the intensive margin, we define conservative procedures as those involving no surgery, increased use of lab tests, and greater reliance on traditional Chinese medicine; on the extensive margin, conservative behavior is reflected in the decision not to admit high-risk patients and referring patients to hospitals of higher tiers.

of the negative shocks times the perceived probability of the negative shock. In particular, C_d measures the physician's cost from the patient's bad outcomes, such as death or severe injury (hence the subscript "d"), and C_s measures the physician's cost from being sued or attacked (hence the subscript "s"). It is important to emphasize that in the context of China, both C_d and C_s are mostly mental costs, rather than financial costs, and we will provide more supporting evidence on this interpretation later. The perceived probabilities of the two events by the physician are $E(D_t|\theta_t(\mathcal{H}_t), x_t)$ and $E(S_t|\theta_t(\mathcal{H}_t), \gamma_t(\mathcal{H}_t), x_t)$, which depend on the riskiness of treatment x_t and the history of negative events $\mathcal{H}_t$. We will detail these perceived probabilities in the following part. Reflecting the reality, we assume that physicians will only be sued or attacked if the patient experiences an adverse outcome after treatment. Lastly, $F(x_t)$ measures the financial incentives of physicians, which include revenues and treatment costs. It is common to assume that $F'(x) > 0$, that is, income increases with the riskiness of the treatment.

Physicians' Belief on the Risks. Physicians form risk perceptions about patient outcome and lawsuit over time because these events are rare events. To be more specific, D_t measures the outcome of the patient in period t: $D_t = 1$ if death occurs and $D_t = 0$ otherwise; and S_t measures the physician's outcome: $S_t = 1$ if the physician is sued (or attacked) and $S_t = 0$ otherwise. $\mathcal{H}_t$ represents the entire history of patient deaths and lawsuits by period t, which shapes the physician's belief in period t, and $\mathcal{H}_t = \{\mathcal{H}_{t-1}, (D_t, S_t)\}$. Physicians update their beliefs on the likelihood of the two events from their own encounters of such events as well as from the observations of colleagues' encounters. For simplicity, we assume that physicians know their own costs C_d and C_s when faced with these adverse events.

The physician's beliefs about the probabilities of the two events are functions of the treatment intensity x_t and depend on the history of the events $\mathcal{H}_t$. The beliefs are represented by $E(D_t|\theta_t(\mathcal{H}_t), x_t)$ and $E(S_t|\theta_t(\mathcal{H}_t), \gamma_t(\mathcal{H}_t), x_t)$, which follows the Bernoulli distribution specified below. First, in period t, the physician believes that D_t follows a Bernoulli distribution with parameter θ_t,

$$D_t = \begin{cases} 1 & \text{with prob. } f(x_t)\theta_t \\ 0 & \text{with prob. } 1 - f(x_t)\theta_t, \end{cases} \tag{1}$$

where θ_t depends on the history of events, which will be detailed later, and $f(x_t)$ is an increasing function of x_t, assuming that riskier procedures are associated with higher probabilities of patient death.

Second, in the event of a patient's death or serious injury, the physician may be sued by the patient. Thus, conditioned on $D_t = 1$, the physician believes that S_t follows a Bernoulli distribution with parameter γ_t,

$$S_t = \begin{cases} 1 & \text{with prob. } g(x_t)\gamma_t \\ 0 & \text{with prob. } 1 - g(x_t)\gamma_t, \end{cases} \tag{2}$$

where γ_t depends on the history of events, and $g(x_t)$ is an increasing function of x_t, assuming that riskier procedures are associated with higher probabilities of lawsuits. In order for the utility function to be concave, it is natural to assume $f(x_t)$ and $g(x_t)$ to be convex.

Physicians' Belief Updating. θ_t is a random variable that captures the physicians' learning process on patient outcomes. It follows a Beta distribution $Beta(a_t, b_t)$, where a_t and b_t are shape parameters of the Beta distribution that are updated over time. The mean and variance of θ_t are given by:

$$\mu_t^d = \frac{a_t}{a_t + b_t}$$

$$\sigma_t^d = \frac{a_t b_t}{(a_t + b_t)^2 (a_t + b_t + 1)}.$$

Without any history, physicians start with the prior that the patient's death occurs with probability $f(x)\mu_0^d$, where

$$\mu_0^d = \frac{a_0}{a_0 + b_0}.$$

The updating process is then specified in a recursive manner as follows:

$$a_t = a_{t-1} + D_t$$

$$b_t = b_{t-1} + 1 - D_t.$$

Similar to θ_t, γ_t is a random variable that captures the physicians' learning process on the probability of being sued. A physician only updates their belief on the distribution of γ_t when there is a patient death. γ_t follows a Beta distribution $Beta(\alpha_t, \beta_t)$, where α_t and β_t are shape parameters updated over time. The mean and variance of θ_t is given by:

$$\mu_t^s = \frac{\alpha_t}{\alpha_t + \beta_t}$$

$$\sigma_t^s = \frac{\alpha_t \beta_t}{(\alpha_t + \beta_t)^2 (\alpha_t + \beta_t + 1)}$$

The physicians start with the prior

$$\mu_0^s = \frac{\alpha_0}{\alpha_0 + \beta_0}$$

The update process is then specified as:

$$\alpha_t = \alpha_{t-1} + S_t$$

$$\beta_t = \beta_{t-1} + D_t - S_t.$$

3.2 Scenario 2: Short Memory and Overreaction

To account for memory decay over time, we introduce a discount factor ρ in the physicians' belief formation. When $\rho < 1$, physicians put a greater weight on the most recent event, and thus events that occurred earlier are more discounted in forming risk perception. This discount factor can be viewed as a weight to control the salience of the recent event, in a similar spirit of Bordalo, Gennaioli, and Shleifer (2022). In our modeling, memory or attention is selective in a particular way: the likelihood of recall depends on how far away an event occurred, as we assume that recent events are always more prominent. As a result, in forming the belief of a patient's death,

$$a_t = \rho a_{t-1} + D_t$$

$$b_t = \rho b_{t-1} + 1 - D_t.$$

If $\rho = 1$, physicians remember all events clearly in the past, and none of the events are particularly salient. This is the case in the Bayesian learning model.

Similarly, the belief of a lawsuit is formed as

$$\alpha_t = \rho \alpha_{t-1} + S_t$$

$$\beta_t = \rho \beta_{t-1} + D_t - S_t.$$

3.3 Effect of the Shocks on Physician Treatment Choice

There are three possible cases: (1) Should the patient's outcome be favorable, the physician faces no risk of lawsuit; (2) a negative patient outcome (patient death or severe injury) occurs and invites a lawsuit; (3) a negative patient outcome (patient death) occurs but does not induce a lawsuit. We now examine how physicians change their perception of the risk of malpractice cases and adapt their treatment strategies in light of these cases under the Bayesian learning model ($\rho = 1$) and the short memory model ($\rho < 1$) separately. We defer the complete proof to Appendix A.

Proposition 1 *The optimal treatment choice has the following property when there is a favorable patient outcome: $x^*(e, \{\mathcal{H}_{t-1}, (0,0)\}) > x^*(e, \mathcal{H}_{t-1})$, $\forall e$, i.e., the physicians become more aggressive after a good patient outcome;*

In the case of a favorable patient outcome, i.e., $D_t = 0, S_t = 0$, the physician would downward adjust her belief on the risk of patient death and does not change her belief on the risk of a lawsuit at a given treatment intensity. That is, we have

$$\mu_t^d = \frac{a_t}{a_t + b_t} = \frac{\rho a_{t-1}}{\rho(a_{t-1} + b_{t-1}) + 1} < \mu_{t-1}^d$$

$$\mu_t^s = \mu_{t-1}^s.$$

Therefore, with a lower perceived risk, the physician adopts more aggressive treatment choices for any given patient type. This proposition holds for both $\rho = 1$ and $\rho < 1$.

Proposition 2 *The optimal treatment choice has the following properties when there is an adverse patient outcome and a related lawsuit shock to the physician:*

(1) $x^*(e, \{\mathcal{H}_{t-1}, (1,1)\}) < x^*(e, \mathcal{H}_{t-1})$, $\forall e$, *i.e., the physicians become more conservative after a lawsuit;*

(2) $|x^*(e, \{\mathcal{H}_{t-1}, (1,1)\}) - x^*(e, \mathcal{H}_{t-1})|$ *decreases in* $\sum_{k=1}^{t-1} \rho^{t-k} S_k$.

- *If* $\rho = 1$, $|x^*(e, \{\mathcal{H}_{t-1}, (1,1)\}) - x^*(e, \mathcal{H}_{t-1})|$ *decreases in* $\sum_{k=1}^{t-1} S_k$. *The magnitude of the effect of a lawsuit in (1) becomes smaller as there are more patient deaths and lawsuits in history.*
- *If* $\rho < 1$, *on the other hand, this magnitude of the effect may not decrease with the number of cumulative lawsuits in history if the discount is large enough.*

In the case of patient death and the following lawsuit shock to the physician, i.e., $D_t = 1, S_t = 1$, the physician would upward adjust her belief on the risk of patient death and on the risk of a lawsuit. That is, we have

$$\mu_t^d = \frac{a_t}{a_t + b_t} = \frac{\rho a_{t-1} + 1}{\rho(a_{t-1} + b_{t-1}) + 1} > \mu_{t-1}^d$$

$$\mu_t^s = \frac{\alpha_t}{\alpha_t + \beta_t} = \frac{\rho \alpha_{t-1} + 1}{\rho(\alpha_{t-1} + \beta_{t-1}) + 1} > \mu_{t-1}^s.$$

Therefore, with a higher perceived risk, the physician adopts more conservative treatment choices for any given patient type. In a model based solely on Bayesian learning, the magnitude of responses will vary depending on the number of past lawsuits. However, in a model incorporating salience effects, responses may remain consistent regardless of the history of prior events, as physicians react primarily to the most recent and salient events.

Proposition 3 *The optimal treatment choice has the following properties when there is a patient death but no lawsuit shock to the physician:*

(1) $x^*(e, \{\mathcal{H}_{t-1}, (1,0)\}) > x^*(e, \{\mathcal{H}_{t-1}, (1,1)\})$, *i.e., physicians behave less conservatively in facing a patient death without a lawsuit compared to that when they face a lawsuit.*

(2) The sign of $x^*(e, \{\mathcal{H}_{t-1}, (1,0)\}) - x^*(e, \mathcal{H}_{t-1})$ *is undermined, but increases in* $\sum_{k=1}^{t-1} \rho^{t-k-1} s_k$. *That is, when* $\rho < 1$, *this implies that a physician is more likely to increase the risk of treatment in response to a patient's death if a lawsuit occurred more recently. In contrast, if no recent lawsuit occurred, the same shock can lead to a decrease in the risk of treatment. However, when* $\rho = 1$, *the timing of previous lawsuits no longer matters; Physician responses depend only on the total number of past lawsuits, not their recency.*

In the case of patient death but no adverse lawsuit shock to the physician, i.e., $D_t = 1, S_t = 0$, the physician would upward adjust her belief on the risk of patient death while downward adjusting on the risk of a lawsuit. That is, we have

$$\mu_t^d = \frac{a_t}{a_t + b_t} = \frac{\rho a_{t-1} + 1}{\rho(a_{t-1} + b_{t-1}) + 1} > \mu_{t-1}^d$$

$$\mu_t^s = \frac{\alpha_t}{\alpha_t + \beta_t} = \frac{\rho \alpha_{t-1}}{\rho(\alpha_{t-1} + \beta_{t-1}) + 1} < \mu_{t-1}^s.$$

Because of the countervailing forces, the effect on physician behavior is thus undermined. However, two comparisons can be made. First, compared to the previous scenario where a patient's death is followed by a lawsuit, not being sued serves as a positive signal that drives the perceived risk of a lawsuit downward. Therefore, the physician responds less conservatively to a patient's death without a lawsuit than with a lawsuit.

Second, in the salience model, compared to a current patient's death (without resulting in a lawsuit, i.e., $D_t = 1, S_t = 0$) when no recent lawsuit is salient in memory or attention, the one following a recent lawsuit will cause a larger downward adjustment of the risk of a lawsuit. This is because the salient memory of the recent lawsuit makes the absence of a lawsuit stand out as good news, in contrast. As a result, physicians are more likely to adopt a more aggressive treatment approach. In contrast, in the Bayesian learning model, the physician's response to the current patient's death does not depend on how recently they encountered a lawsuit.

Spillover. Lastly, we briefly discuss the implications of the spillover effect in the model. In the case where the physician observes that another physician is sued in the same hospital rather than being the defendant directly, it is natural to assume that the updating process is discounted by factor ϕ as:

$$\begin{aligned} a_t &= \rho a_{t-1} + \phi D_t, \\ b_t &= \rho b_{t-1} + \phi(1 - D_t), \\ \alpha_t &= \rho \alpha_{t-1} + \phi S_t, \\ \beta_t &= \rho \beta_{t-1} + \phi(D_t - S_t). \end{aligned}$$

Consequently, the magnitudes of the effects documented in Propositions 1-3 decrease with ϕ.

4 Data Sets and Descriptive Statistics

4.1 Data Sets

Lawsuit Data. We manually collect all court verdicts on civil medical malpractice cases from the China Judgment Online website (https://wenshu.court.gov.cn/), which is officially operated by the Supreme People's Court of China. In 2013, as part of its efforts to increase judicial transparency and provide (non-binding) precedents for judges, the Supreme People's Court established the China Judgment Online website and required local courts at all levels to publish both contemporary and historical verdicts on this website. Although there was a backlog in digitizing and disclosing historical verdicts, local courts are obligated to disclose all contemporary judgment files within seven days of trial completion, with exemptions granted for special cases such as those involving state secrets, juvenile criminal cases, disputes concluded through mediation, and divorce and adoption cases.[8] Therefore, for our analysis starting in 2014, the database covers the universe of judgments.

We search and screen the database of verdicts based on the following three rules: (1) the court verdict is for the first instance (as supposed to appeals) of a civil case; (2) the reasons for the lawsuit are medical disputes; (3) at least one of the defendants is a hospital or a department within a hospital in our sample. For each of these court verdicts, we carefully go through its text and only retain the medical lawsuits pertaining to medical visits by the plaintiff to our sample hospitals between June 2014 and June 2018 (see below for information regarding our sample hospitals). Our final sample contains a total of 64 cases.

For each judgment file, we manually extract the following information: the defendant hospital and department, the alleged injury, the plaintiff's requested restitution, the outcome that involves the total damage and the ratio for which the defendant is responsible as ruled by the court and the disposition of the defendant, and the detailed timeline and facts of the case, which include the dates of which medical expert review(s) were requested and conducted, case filing, trial, and ruling dates, etc.

Claims Data. We use de-identified claims data, provided by its Healthcare Security Administration, for hospital inpatient services in a midsize Chinese city. There are a total of 28 hospitals in the city. The hospital inpatient records cover all 28 hospitals in a large district of that city from June 2014 to June 2018. It includes patient ID, hospital ID, admission and discharge dates, diagnosis name, ICD-10 code,[9] total costs and costs by procedure category (i.e., medicine, traditional Chinese medicine, surgery, materials, lab, facility, nursing, etc.), out-of-pocket costs to the patient, insurance payments, patient insurance type, patient coinsurance rate, age, sex, profession, location, whether a patient receives government subsidies, whether a patient has comorbidity, and whether a patient dies in hospital.[10] To further measure patient health outcomes, we define a 30-day readmission dummy for each visit. This dummy equals 1 if we observe a patient seeking inpatient services within the next 30 days following the discharge in any hospital in the city for any reason.

[8] For cases that the local courts decide not to release the verdict, the regulation requires disclosure of the case ID, the name of the court, the filing date, and an explanation.

[9] ICD-10 includes alphanumeric codes published by the World Health Organization to represent diagnoses.

[10] A patient's profession and location are divided into rough categories. The profession of a patient falls into one of the following categories: agricultural employment, student, unemployment, or worker. Their location refers to one of the ten boroughs in that city.

Matching the Two Data Sets. Since the judgment files also indicate the patient's hospital admission and discharge dates, diagnoses, and total medical costs, we are able to match each case with a particular visit in the claims data. This allows us to identify the exact department in which the patient was treated, especially when several departments perform a similar function in the hospital.

4.2 Descriptive Statistics

Table 1 reports the summary statistics of the medical malpractice lawsuits, for the entire sample and for cases that were resolved in the hospitals' favor (winning cases) and in the plaintiffs' favor (losing cases), respectively.[11] Panel A displays the alleged error in each case. About two thirds of the alleged errors are related to treatment, and the rest are related to wrong or missed diagnoses. Almost half of the errors are related to surgery and in such cases the probability of the hospital losing the case is 1.7 times higher than that of other alleged errors. This distribution of alleged errors motivates us to examine in our subsequent analysis changes in the likelihood of surgery, the intensity of diagnostic tests, and the overall intensity of treatment. Panel B shows that two-thirds of the patients involved were disabled and the other one-third were dead. Panel C indicates that 12 out of 28 hospitals in this area were sued during the four years and 80% of the defendant hospitals are top-tier (tertiary) hospitals. Overall, hospitals won 40 of the 64 cases. With few exceptions, there are more winning cases than losing cases in each hospital. In addition, the probability of winning is not correlated with the hospital tier.

[Table 1 about here]

Table 2 presents summary statistics for the medical claims data, including health care utilization and health outcomes. Care utilization measures include intensive margins such as the total cost, the cost covered by insurance, the out-of-pocket cost, a dummy for surgery, the total surgery cost, the cost of Chinese medicine, the laboratory cost and the ratio of the surgery cost (the cost of traditional Chinese medicine, or the lab cost) to the total medical cost. The extensive margins of utilization refer to whether admission is a referral from other hospitals (referral admission), whether the patient was eventually referred to other hospitals at discharge, and whether the specialty of a visit belongs to those with the highest mortality rates (high-risk specialty). Patient health outcomes include a 30-day readmission rate and in-hospital mortality.

All utilization measures are chosen to measure the conservativeness of treatment. The reason why we focus on surgery measures is that, as Table 1 shows, nearly half of the alleged errors are related to surgery, and in such cases, the probability of the hospital losing the case is 1.7 times higher than that in other alleged errors. In addition, surgery is a risky treatment option. Avoiding high-risk procedures for fear of malpractice lawsuit is considered *avoidance behavior* of defensive medicine (Studdert et al., 2005). On the other hand, we choose the utilization of traditional Chinese

[11] Winning cases are cases where physicians' eventual liability is less than 30%, i.e., patients receive less than 30% of the court acknowledged cost.

medicine and lab tests to capture the *assurance behavior* of defensive medicine. Among all the cases of medical malpractice in our sample, none of them mentioned the use of Chinese medicine as a reason for medical injury. In addition, one third of the alleged errors are missed or wrong diagnoses, and medical diagnoses based on laboratory tests are frequently used as evidence for physicians' due diligence based on the arguments in court documents. Therefore, we consider the use of Chinese medicine and lab tests to be conservative. In the literature on defensive medicine, an increase in such conservative treatment is termed as "positive" defensive medicine, while refusing high-risk procedures or patients is termed as "negative" defensive medicine (Hershey, 1972).

On average, each visit costs 7,886 Chinese Yuan (CNY), with an out-of-pocket expense of 3,222 CNY. About 24 percent of the patient visits involve a surgical procedure. On average, surgery, Chinese medicine, and lab test costs constitute 2, 7, and 1 percent of the total cost, respectively.[12] Regarding the characteristics of the visit, 3 percent of inpatient admissions were referred by other hospitals, and 4 percent of visits were referred to another hospital upon discharge. Additionally, 4 percent of visits fall within the five specialties with the highest mortality rates, while 12 percent fall within the ten specialties with the highest mortality rates. Regarding health outcomes, the average 30-day readmission rate is 10 percent, and the in-hospital mortality rate is 0.2 percent.

[Table 2 about here]

5 Empirical Strategy

5.1 From Model to Data

First, it is convenient to organize the model predictions into testable hypotheses that will be tested in our subsequent empirical investigation.

Hypothesis 1: Response to Lawsuit *Physicians become more conservative after a lawsuit.*

Hypothesis 2: Short-lasting Effect *The physicians become more aggressive after a good patient outcome. Thus, the conservative response to the lawsuit gradually fades out.*

Hypothesis 3: Spillover Effect *The physicians' response to a lawsuit is larger in magnitude for physicians in the sued department and can spill over to other departments in the same hospital with a smaller magnitude.*

To assess whether physicians' responses align with rational expectations, we test the following hypotheses:

[12]The surgery cost excludes hospital facility fees, room and board charges, material costs, and anesthesia fees. It represents nearly 10% of the total cost for surgical patients, a proportion comparable to surgeon reimbursement in the US, which represents approximately 10% of the total inpatient costs for surgical patients (Ejaz et al., 2016).

Hypothesis 4: Heterogeneous Effect *Under Bayesian learning, physicians' response to lawsuits diminishes as the number of previous lawsuits increases. However, if physicians have short memory and/or recent shock is more salient to the physicians, the response to a new lawsuit remains independent of the number of past lawsuits.*

Hypothesis 5: Response to In-hospital Death *In Bayesian learning, physicians' response to the death of a patient is independent of the timing of previous lawsuits. If physicians have short memories, their responses depend on whether there is an imminent precedent lawsuit. They may become relatively more aggressive in response to in-hospital deaths following a recent lawsuit.*

5.2 Impact of Medical Lawsuits

We estimate the effect of medical lawsuits on physician behavior using a stacked DID approach. We construct our sample for DID analysis as follows.

Treatment Date. For each case, we construct a sample using the 120-day window around the "treatment date." As discussed in Section 2, we choose the date the patient applied for their first expert review as the treatment date for two reasons. First, while physicians are constantly dealing with potential disputes with patients, the notification of review by medical experts serves as an initial indication that the disputes have turned into a lawsuit. Second, the dispute is only known to the litigant hospital during the period between expert review and public court trial. When the case enters the phase of a court trial, the information that the hospital is sued becomes public. Public disclosure of the information about the lawsuit may pose two challenges to our empirical test. First, it may affect the other patients' choice of the hospital if the patients take the lawsuit as a signal for care quality, and thus change the composition of hospitals' patient pool. In such cases, any observed change in the physician's behavior may be due to the change in the patient pools. Second, information spillover to other hospitals may contaminate our control group and confound our analysis. Therefore, the first expert review date as our treatment date guarantees that physicians are affected immediately after treatment, and only those within the treated hospitals are affected.

In our baseline specification, for each malpractice lawsuit case, the treatment group includes all physicians in the sued hospital during the event window for that case. The control group consists of physicians whose hospitals did not experience a lawsuit during this event window. For some hospitals, there are multiple cases during our sample period. In order to obtain a clean design, we keep only cases in which there is only one lawsuit during the 120-day window for the treated hospital. For example, if there are two consecutive events (the gap is less than 120 days) during the sample period for the same hospital, we drop all observations from 60 days before the first event to 60 days after the last event from our sample so that these observations are not in the treatment group nor in the control group. We then stack the sample for each case, which constitutes the final sample for our empirical analysis.

We chose the 120-day window for three reasons.[13] First, it usually takes more than two months from the first expert review to the trial. Keeping only 60 days after the treatment date guarantees that the information of medical dispute is only known to the physicians in the sued hospital so that our post-treatment period is not confounded by the information spillover to other hospitals from a public trial. Second, since we only keep the cases such that there is only one case during the event window, using longer windows will cause a bigger loss of observations. Third, as demonstrated in Section 6.2, the findings of the event study indicate that the impact of the lawsuit on physician behavior is temporary and disappears in 6 weeks. Consequently, a 120-day time frame ensures that physicians in the control group remain unaffected by lawsuits occurring 60 days earlier.

Stacked DID. Our stacked DID analysis uses the following specification. For patient i in hospital h at date t in the claims sample within the 120-day window around case c,

$$\begin{aligned} Y_{ihtc} = &\beta_1 \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} + \beta_2 \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\} \\ &+ \mathbf{\Gamma} \cdot \mathbf{X}_i + \alpha_h + \eta_{ct} + \epsilon_{ihtc}, \end{aligned} \tag{3}$$

where Y_{ihtc} measures the physician's choice of treatment or the outcome of the patient i; $\mathbf{X}_i$ is a vector of patient characteristics that includes patient insurance type, age, sex, profession, location, dummies of diagnosis codes, whether a patient receives government subsidies and whether a patient has comorbidity; $\mathcal{H}_c^{\text{sued}}$ represents the treated hospital in case c, T_c^{review} represents the treatment date in case c— the date when the patient applied for the first expert review. We include hospital fixed effects, α_h, which account for all time-invariant differences among hospitals. We also include case-specific date fixed effects η_{ct}, which flexibly account for case-specific time trends in outcomes. Standard errors are clustered at the hospital level. β_2 is the coefficient of interest, which measures the difference in the change in healthcare utilization or patient health outcomes following a malpractice lawsuit between the litigant and the control hospitals within each case.

5.3 Other Adverse Shocks to Physicians

Although malpractice lawsuits are the primary type of adverse shock we focus on, we also examine two other types of shock that physicians face to explore the mechanism of the physician response and test several alternative explanations: (1) patients' in-hospital deaths; and (2) violent attacks toward physicians that cause physician injuries.

Following our theoretical model, patients' in-hospital deaths will update physicians' beliefs on patient adverse outcomes. A violent attack is considered an escalated case of medical malpractice, which will update physicians' beliefs on the probability of being sued or attacked conditioning on adverse patient outcomes. The response to these shocks will inform us about the mechanism affecting the physician's treatment choices. We leave the detailed discussion of the empirical design to Section 7.

[13] Our empirical results are robust to different choices of event windows from 60 days to 240 days.

6 Empirical Results

6.1 Baseline Results: How Do Physicians Respond to Lawsuits?

In this subsection, we present the baseline results of estimating Equation (3) that examines the effect of medical lawsuits on physician behavior and patient outcomes. We show that they are consistent with Hypothesis 1, which is that physicians become more conservative in response to lawsuits. We organize our results in four sets: (1) patient medical costs; (2) treatment choices on the intensive margin; (3) admission and referral decisions on the extensive margin; and (4) patient health outcomes. The results are reported in Tables 3-7.

Table 3 reports the regression results for the first set of dependent variables on patient medical costs. Column (1) shows that medical lawsuit is associated with a slight increase of 71 CNY per visit in the total cost of the patients, and the effect is statistically insignificant. Columns (2)-(3) further break down the cost into insurance-covered cost and the patient's out-of-pocket cost. The increase in total cost is mainly driven by the insurance-covered component. On average, patient insurance-covered expenses increase by 75 CNY per visit (equivalent to about 1.7% of the average cost), and the out-of-pocket cost remains almost the same. As insurance usually covers more basic medical procedures and medications, the compositional change suggests that physicians may turn to more conservative treatment choices after a lawsuit.

[Table 3 about here]

In addition, we examine more detailed categories of physician treatment choices and document significant and meaningful changes. First, Column (1) of Table 4 shows that the probability of surgery decreases by 1.5 percentage points (equivalent to 6.4% of the average probability) after physicians in the sued hospitals experience a lawsuit, and Columns (2) and (3) show that the average cost of surgery and its ratio over the total cost also decrease, and the magnitudes account for 2.9% and 5.3% of the average value of each variable, respectively. It should be noted that surgery is not always a riskier choice for all patients. In some cases, such as childbirth and heart attack, surgery is considered a more defensive approach, allowing physicians to reduce their exposure to malpractice liability (Grant and McInnes, 2004; Shurtz, 2013; Avraham and Schanzenbach, 2015). Therefore, in these specialties, one might expect an increase in the likelihood of surgery following a lawsuit. We examine these specialties separately, and the results, reported in Table B1, indicate that the likelihood of heart surgery (including angioplasty and bypass procedures) and C-section increases, consistent with the findings in the literature.

Second, Column (4) shows that, after a lawsuit in the sued hospitals, the cost of Chinese medicine increases and represents a higher proportion of the total cost by 0.2 percentage points (equivalent to 3% of its average value), and Column (5) shows that the proportion of Chinese medicine increase by 0.2 percentage points (equivalent to 3.3% of its average value).

Third, column (6) shows that patients spend on average 8.6 CNY (equivalent to 11% of its average value) more on laboratory tests, and column (7) shows that the proportion of laboratory test cost increases by 0.1 percentage points (equivalent to 14% of its average value). The composition change in treatment choices explains the null effect on patients' total medical cost— expenses on high-risk procedures decrease while on conservative procedures increase. In general, the findings of Table 4 suggest that physicians in the sued hospitals adopt a more conservative approach after medical lawsuits by opting for low-risk treatment and performing more protective examinations.

[Table 4 about here]

Table 5 reports the effect of the lawsuit on physicians' responses on the extensive margin. As shown in column (1), the likelihood of referral admissions from other hospitals drops by 0.44 percentage points (equivalent to 11% of its average value). Given that the information regarding the lawsuit remains private to the sued hospital in our post-period, we interpret this change as a choice of the litigant hospital refusing to admit instead of the choice of the referring hospitals being less willing to transfer the patients. Column (2) suggests that there is no statistically significant effect of lawsuit on the sued hospital's referral to other hospitals. Column (3) defines high-risk specialties by considering the top 5 mortality specialties, which include emergency medicine, neurological surgery, cardiovascular surgery, pulmonology, and intensive care unit. It shows that there are 0.46 percentage points (equivalent to 10.5 percent of its average value) fewer admissions for high-risk patients. Column (4) expands the scope to the top 10 mortality specialties, adding hematology, gastroenterology, endocrinology, neurology, and infection. With this broader definition of high-risk specialty, the probability of admitting high-risk patients decreases by 1.74 percentage points (equivalent to 15.7 percent of its average value).

[Table 5 about here]

A natural question is whether the decrease in surgery rate is entirely driven by the decrease in the admission of high-risk patients or can be partially explained by more conservative treatment choices for low-risk patients. To this end, we examine the change in the surgery rate for the high-risk and low-risk types separately. Table 6 shows that the decrease in the likelihood of surgery remains robust and statistically significant only in the low-risk sample, indicating that the drop in the surgery rate is in part due to physicians' more conservative decisions for low-risk patients for whom surgery is more discretionary. In sum, physicians respond differently to patients with varying levels of risk—they more frequently reject high-risk patients and decrease high-risk procedures for low-risk patients.

[Table 6 about here]

Lastly, what do the above care utilization changes imply about patient health outcomes? However, it turns out that the quality of health care is worse, measured by the readmission rate at 30 days and the death at the hospital. Column (1) in Table 7 suggests that the likelihood of 30-day readmission increases by 0.3 percentage points (equivalent to 3 percent of its average value) after a hospital experiences a lawsuit. Column (2) reveals that the effect of the lawsuit on the probability of death of patients in the hospital is statistically insignificant, although the sign is positive. The results of these health outcomes, along with the fact that more high-risk patients were denied admission, suggest that physician behavioral changes are not in the patient's best interest, consistent with the notion of defensive medicine.

[Table 7 about here]

We conduct two robustness checks. First, we address the concern that rejecting high-risk patients after a lawsuit can contaminate the control group if those rejected patients seek care at other hospitals within the control group. It is reasonable to assume that the rejected patients who are originally referred from other hospitals would be referred to another hospital of the same or higher tier. Similarly, high-risk patients denied admission are likely to seek care in a hospital of the same or higher tier. Therefore, in our robustness check, we exclude control hospitals of the same or higher tier. Tables B3 to B6 demonstrate that even with this adjustment, all our results remain robust.

Second, to confirm that hospitals do not lose business due to lawsuits, and documented responses are from the supply side rather than the patient side, we show that the number of hospitalized patients does not change after the lawsuit in Table B2.

6.2 Are Physicians' Responses Short-lasting?

Hypothesis 2 predicts that physicians become more aggressive after a good patient outcome, and thus, the conservative response to the lawsuit gradually fades out. We test this hypothesis by examining the dynamic effect of medical lawsuit on physicians' behavior. Moreover, the "parallel trend" assumption for the validity of our DID strategy is that, in the absence of a lawsuit, physicians in the sued hospital would have the same trend of behavior as the ones in the control group. The event study also provides supporting evidence for this assumption. Specifically, we estimate the following augmented regression equation:

$$\begin{aligned} Y_{ihtc} = & \beta_1 \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} + \sum_{w=-4}^{6} \beta_{2w} \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{T_c^{\text{review}} + 14(w+1) \geq t > T_c^{\text{review}} + 14w\} \\ & + \mathbf{\Gamma} \cdot \mathbf{X_i} + \alpha_h + \eta_{ct} + \epsilon_{ihtc}, \end{aligned} \tag{4}$$

where $\mathbb{1}\{T_c^{\text{review}} + 14(w+1) \geq t > T_c^{\text{review}} + 14w\}$ is the indicator for the w^{th} biweek from the event date. The biweek -1, the biweek just before the medical expert review is filed, is the reference period. Our coefficients of interest are the β_{2w}s, which capture the dynamic effect of medical lawsuits on physician behavior. We examine a 10-biweek window around the event date.

Figure 3 plots the estimated β_{2w} with 95% confidence intervals. It shows that before the lawsuit, physicians' treatment choices and patient outcomes in treated and control hospitals do not exhibit differential trends. After the event date, differences emerge between treated and control hospitals and the difference gradually decreases over time. By the 10th week after the event date, the impact of lawsuit in all dimensions turns statistically insignificant. Our model indicates that the reason for this short-lived effect on physician behavior is that physicians gradually readjust their beliefs about the risks of negative shocks downwards when daily practices provide positive signals. This explains why physicians are not permanently more conservative. Instead, they constantly learn about the probability of negative shocks and adjust their behavior accordingly. The short-lasting effects cannot be rationalized by explaining that physicians are making a deliberate effort to correct medical errors, which would likely result in more sustained changes in their practice and improved patient outcomes.

[Figure 3 about here]

Remark 1 It should be noted that Carroll, Cutler, and Jena (2021) finds that the effect of the malpractice lawsuits on physician behavior is persistent over two years. In addition to the differences between our contexts, one potential reason is the frequency of events. On average, Chinese physicians see many times more patients than US physicians every day, which means that belief updating occurs more frequently. Thus, in the Chinese context it is more likely that the effect will diminish in a shorter period of time. Another possible reason is that the primary effect of a lawsuit is mental instead of pecuniary pressure, and the mental effect tends to wear out more quickly.

6.3 Testing the Spillover Effect

According to Hypothesis 3, physicians update their beliefs to a greater extent when they personally experience a lawsuit, compared to when they simply observe a lawsuit involving others. Therefore, it is plausible to anticipate that the previously documented hospital-wide response is more pronounced in the litigant department, followed by departments of similar functions to the sued department, and that of the other departments respond with smaller magnitude. In order to examine this heterogeneous spillover effect, we define the same department as departments of exactly the same function but managed separately by different teams and similar department as departments of similar functions. For example, if the Department of Gynecology division I is sued, the Department of Gynecology division II is considered a same department, and the Department of Obstetrics is considered a similar department, and the response from the similar department will be smaller than the sued department but will be larger than other non-similar departments.

We test the spillover effect by comparing the treatment effect of the treated department with that of other departments in the same hospital, using all departments in other hospitals as the control group. Specifically, we interact an indicator for the sued department with the DID term, $\mathbb{1}\{d(h) \in \mathcal{D}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\}$, in Equation (3) and include hospital-by-department fixed effects.

$$Y_{ihdtc} = \beta_1 \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} + \beta_2 \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\} + \beta_3 \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\} \cdot \mathbb{1}\{d(h) \in \mathcal{D}_c^{\text{sued}}\}$$
$$+ \beta_4 \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\} \cdot \mathbb{1}\{d(h) \in \mathcal{D}_c^{\text{similar}}\} + \mathbf{\Gamma} \cdot \mathbf{X}_i + \alpha_{hd} + \eta_{ct} + \epsilon_{ihdtc}, \quad (5)$$

where i represents patient, h for hospital, d for department, t for time, and c for case. $\mathbb{1}\{d \in \mathcal{D}_c^{\text{sued}}\}$ is a dummy variable that takes the value 1 for the sued department, and $\mathbb{1}\{d \in \mathcal{D}_c^{\text{similar}}\}$ is a dummy variable that takes the value 1 for the similar department. The coefficients of interest are β_2 and β_3, where $\beta_2 + \beta_3$ measures the treatment effect on the sued department, and β_2 measures the spillover effect to other departments in the treated hospital. Similarly, $\beta_2 + \beta_4$ measures the treatment effect on the sued department. We are interested in the coefficient that measures the spillover effect on other departments in the treated hospital and the coefficient that measures how the treatment effect of the sued department (or similar department) is different from the spillover effect.

Guided by the findings of the main results, we examine three sets of variables: (1) treatment choices measured by total cost, likelihood of surgery, proportion of spending on Chinese medicine and proportion of spending on laboratory tests; (2) extensive margins measured by admission that is a referral from other hospitals, referral to other hospitals at discharge, and admission of high-risk patients; and (3) patient outcomes measured by likelihood of readmission within 30 days and likelihood of death in hospital.

For ease of comparison, we plot the effects estimated with 95% confidence intervals for the estimates of non-sued departments in the treated hospital ($\hat{\beta}_2$), the same department ($\hat{\beta}_2 + \hat{\beta}_3$), and the similar department ($\hat{\beta}_2 + \hat{\beta}_4$) separately in Figure 4 and report the full regression results in Appendix Table B8 and B9. In Figure 4, the blue triangles show the responses of the non-sued departments in the treated hospital, that is, the spillover effect. It shows that the spillover effects are consistent with the hospital-wide responses — physicians perform fewer surgeries, prescribe more Chinese medicines, conduct more laboratory tests, decrease referral acceptance and admission of high-risk patients, and such responses are not justified by health outcomes because the patients' 30-day readmission rate and in-hospital death rate become higher. The red dots and green squares represent the responses for the sued department and similar departments, respectively. In general, the magnitude of the direct treatment effect is significantly greater than the spillover effect on other departments. This finding aligns with the predictions of Hypothesis 3, suggesting that physicians update their beliefs more strongly when they directly experience a negative shock. It should be noted that the spillover effect documented in this section suggests an underestimation of the treatment effect in the previous literature that includes physicians' colleagues as the control group.

[Figure 4 about here]

6.4 Further Supporting the "Defensive Medicine" Interpretation

The empirical findings above align with the narrative that physicians adjust their perceptions of the risk of malpractice lawsuits and adopt a more defensive approach following each negative shock. In this subsection, we examine several alternative mechanisms for physicians' responses, which may lead to different implications on patients' welfare and corresponding policy remedies.

6.4.1 Correcting Medical Errors

One possible alternative interpretation of our findings is that when a physician is sued by a patient, he/she recognizes the treatment as a medical error and adjusts future treatment choices accordingly. If correcting medical error is the main mechanism driving physicians' responses, such responses should be welfare improving for the patients. However, our empirical findings suggest that patient welfare, measured by 30-day readmission and in-hospital death, is not improved, generating the first direct counter evidence for this alternative mechanism.

To further rule out this mechanism, we perform two heterogeneity tests leveraging the case-level differences. First, we examine the differences between hospitals' cases versus patients' cases.[14] If the behavior changes of the physicians after the lawsuit are driven by correction of medical errors, these changes should differ between the cases won by the hospital (winning cases), where significant medical errors are less likely, and the cases won by the patient (losing cases), where the physicians are more likely to be at fault. Specifically, a much smaller response in winning cases would support the error-correction hypothesis. To test this, we estimate Equation (3) separately for subsamples of winning and losing cases.

We compare the responses for hospital-winning and losing cases separately in Figure 6, with the complete results reported in Table B11. In Figure 6, the blue triangles represent the estimated coefficients (normalized by the average value of the corresponding outcome variable) in the baseline specification as in Section 6.1 as a basis for comparison, while the red dots (green squares) represent the responses of the physicians for hospital-winning (hospital-losing) cases. The results suggest that the treatment effects are similar in magnitude between the winning and losing cases. In fact, physicians who win their cases appear to reject a higher proportion of high-risk patients compared to those in the losing cases. These findings suggest that physicians are unlikely to correct errors.

[Figure 6 about here]

The second test leverages differences in the patient-alleged errors leading to a lawsuit. As shown in Table 1, the reasons for lawsuits can be classified as unsuccessful surgery (45%), insufficient treatment (23%), and missed diagnoses (31%). If a plaintiff claims medical negligence due to inadequate treatment or missed diagnoses, and if physicians acknowledge these errors and correct the error afterwards, they may respond by adopting more aggressive testing and treatment strategies to improve patient outcomes. In such cases, we would expect an increase in surgery rates and laboratory tests. In contrast, if a lawsuit arises from unsuccessful surgeries, physicians may be more cautious about performing surgeries but may not alter their behavior when ordering diagnostic tests. However, as shown in Figure 7 and Table B12, when we separately examine the responses of physicians to cases where the alleged error is a failed surgery versus cases involving inadequate treatment or missed diagnoses, the evidence reveals minimal difference. In particular, even in cases of inadequate treatment, physicians still reduce the number of surgeries and the increase in laboratory tests is relatively modest. Meanwhile, in cases of surgical failure, physicians actually increase their use of lab tests; while they do reduce surgeries afterward, the magnitude of the response is smaller than in cases of inadequate treatment. These patterns further reinforce

[14] We define a case as won by the hospital if it is liable for less than 30% of the costs recognized by the court. The threshold 30% is selected because courts typically require hospitals to bear some costs, even when medical expert reports largely absolve them, partly due to humanitarian concerns. Our results are robust to a threshold of 0 or 50%.

the interpretation that physicians are engaging in defensive medicine rather than correcting past medical errors.

[Figure 7 about here]

Lastly, the short-lived nature of responses contradicts the interpretation of medical error correction, which would typically result in consistent long-term changes in practice.

6.4.2 Hospital Change of Protocol

The second alternative explanation for changes in physician behavior is that when a physician is sued by a patient, the hospital modifies its general practice protocols to prevent future lawsuits, and physicians' responses are due to compliance with these changes. Under this interpretation, while the hospital response can be seen as a form of defensive medicine, it differs from our interpretation, which suggests that physicians and their colleagues individually adjust their behavior based on a higher perceived risk of lawsuit.

We argue that a hospital-wide protocol change is unlikely for two reasons. First, in Section 6.3, we compared the average effects of treatment in the sued department, similar departments, and other departments within the same hospital, finding a significant disparity in their magnitudes. If changes in hospital protocol were driving these responses, we would not expect such large differences between departments. Second, a change in the hospital protocol would not account for the dynamic response patterns documented in Section 6.2. For example, the effect of the treatment is short-lived and gradually fades over time, making it unlikely that hospitals frequently review their protocols. Similarly, in cases of patient death, physicians who have recently faced lawsuits respond differently than those who have not, as shown later in Section 7.2. The duration and heterogeneity of these responses are difficult to reconcile with a hospital-wide protocol change.

7 Are Responses Consistent with Rational Expectation?

Our empirical findings are consistent with theoretical predictions that physicians' responses reflect an increased perception of the risk of litigation which leads to defensive medicine. In this section, we further ask whether these adjustments align with rational expectations. If distorted beliefs about malpractice lawsuit risk lead to even more defensive medicine than would occur under rational expectations, physicians' overreaction may exacerbate welfare losses. In such cases, policy should aim not only to curb defensive medicine, but also to correct misperceptions about litigation risk.

7.1 Heterogeneous Response by Case History

Hypothesis 4 states that, for hospitals having experienced multiple lawsuits, the response to lawsuit should be smaller with perfect Bayesian learning, while may remain the same if physicians put more weight on recent cases. To test this hypothesis, we divide the cases into those involving tertiary hospitals and the rest involving lower-tier hospitals. We divide the sample into two subsamples based on this distinction. Three tertiary hospitals have many lawsuits in history: in total, they experienced 51 out of 64 lawsuits during the sample period. We repeat the analysis for the subsamples separately and present the full results in Appendix Table B7. Figure 2 plots the coefficient estimates standardized with the variable mean for the key variables, comparing the magnitude of response by hospital tiers with the baseline results. It indicates that, except for the ratio of Chinese medicine and laboratory, the responses of the tertiary hospitals are not statistically smaller than those of the lower-tier hospitals. Tertiary hospitals even reject a larger portion of high-risk patients. In general, the evidence supports the model with short memory.

7.2 Heterogeneous Response to Patient Deaths

Guided by the theoretical framework and Hypothesis 5, we further investigate physicians' responses to a type of milder adverse shock—the patient's death that did not lead to lawsuit, and how this response interacts with previous experience of lawsuits. Patients' death can potentially have a substantial emotional toll on physicians. In addition, it may also lead to an increased likelihood of conflicts between physicians and the patient's family members. Therefore, a patient's death changes the physicians' beliefs in both the probability of adverse outcomes and the probability of lawsuit conditioning on adverse outcomes. Hypothesis 4 posits that physicians may react differently to the death of a patient based on the previous occurrence of lawsuits and the extent of memory decay. In particular, it predicts that physicians may become more conservative after a patient's death, but the magnitude of the response is smaller than that of lawsuit. Moreover, physicians are *relatively* more aggressive in response to in-hospital death of patients when they have recently experienced a lawsuit if salience of recent events is the dominant mechanism.

To estimate how the physician's response to a patient's death interacts with the experience of the lawsuit, we augment Equation (3) by adding the death shock and interacting it with the lawsuit shock. In particular, we add a dummy indicating whether patient i's visit is within 30 days after an in-hospital death in i's department to measure the effect of in-hospital death, and we interact this term with $\mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\}$, the shock of the lawsuit. This new interaction term will inform how the physician response to patient death is different if the department just experienced a lawsuit. The regression equation is:

$$\begin{aligned} Y_{ihdtc} = {} & \beta_1 \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} + \beta_2 \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\} \\ & + \beta_3 D_{hdt} + \beta_4 D_{hdt} \cdot \mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\} + \mathbf{\Gamma} \cdot \mathbf{X}_i + \alpha_{hs} + \eta_{ct} + \epsilon_{ihstc} \end{aligned} \tag{6}$$

where D_{hdt} is a dummy variable that takes the value 1 for patients in the department d in the hospital h who just experienced a patient's in-hospital death within the past 30 days and 0 otherwise. The coefficients of interest are β_3 and β_4, where β_3 measures the effect of patient death, and $\beta_3 + \beta_4$ measures the effect of patient death for hospital departments that just experienced a lawsuit.

Remark: Because of the relatively high frequency of in-hospital deaths (0.2%, or about 1,500 counts), it is challenging to identify clean treatment and control groups and stack cases together, as we do for lawsuits. Thus, we conduct the analysis based on the previously constructed case sample (120 days around the lawsuit case) and code an event dummy for in-hospital death. This in-hospital death can occur in the treated or control group.

We report the estimated coefficients, normalized by the average value of the outcome variable, with 95% confidence intervals for the key parameter of interest in Figure 5 and the complete table in Table B10. Figure 5 compares the effects of lawsuits with the effects of in-hospital death both when physicians have not experienced a lawsuit shortly before the time of patient death (red dots) and when physicians have just experienced a lawsuit (green squares). The figure shows that patient death, if not shortly after a lawsuit, causes physicians to be more conservative, but to a lesser extent than a lawsuit. This is consistent with the idea that patient death serves as an alert, shifting physicians' perceived risk of death and lawsuit upward. However, when we look at the response to death when physicians just experienced a lawsuit, physicians practice more aggressively by performing more surgeries and admitting more high-risk patients while decreasing the reliance on Chinese medicine and laboratory tests. This interaction between patient death and lawsuit further supports short memory as the primary mechanism. When physicians' attention or memory is focused solely on the recent lawsuit, they tend to overreact to it. However, a patient's death shortly after this lawsuit without causing a lawsuit contrasts with the recent past lawsuit and becomes a piece of new salient good news. Therefore, physicians adjust their perceived risk of a lawsuit downward, practicing relatively more aggressively.

[Figure 5 about here]

7.3 Response to More Salient Shock

We compare the treatment effects of lawsuits and violent attacks. Although both serve as strong signals for potential risks, violent attacks inflict a much greater psychological shock on physicians. Differences in the magnitude of physician responses provide strong evidence of the salience effect.

During our sample period and among our sample hospitals, we identified one violent attack on a physician, which occurred in December 2017. On that day, a man who had sought care for heart problems and was discharged the previous day returned to the hospital and assaulted a physician with a knife, causing severe injuries. The injured physician worked in the department where the man had been hospitalized, but was not directly responsible for his care.

As this is the only violent case that we identified through an exhaustive search of local media reports during our sample period, we estimate its impact on physician behavior using a standard difference-in-differences design. The treatment group consists of all physicians in the hospital where the attack occurred, while the control group includes physicians from hospitals that did not experience violent incidents during the study period. Our analysis focuses on a 120-day window around the incident date. For patient i in hospital h on date t in the sample of the event window, we estimate the following regression equation:

$$
\begin{aligned}
Y_{iht} = {} & \beta_1 \cdot \mathbb{1}\{h \in \mathcal{H}^{\text{violence}}\} + \beta_2 \cdot \mathbb{1}\{t > T^{\text{violence}}\} + \beta_3 \cdot \mathbb{1}\{h \ \in \mathcal{H}^{\text{violence}}\} \cdot \mathbb{1}\{t > T^{\text{violence}}\} \\
& + \mathbf{\Gamma} \cdot \mathbf{X}_i + \alpha_h + \eta_t + \epsilon_{iht},
\end{aligned} \tag{7}
$$

where $\mathcal{H}^{\text{violence}}$ represents the hospital in which the violent case took place, T^{violence} represents the treatment date, and all other variables are as defined in Equation (3).

We estimate Equation (7) and present the estimated coefficients with 95 percent confidence intervals for the key parameter of interest in Figure 8, with the complete results in Table B13. Comparing the treatment effects of medical lawsuit and violent attacks reveals a significantly larger response to the latter.

Regarding treatment choices, the probability of surgery drops by more than 60 percent of its mean value, almost 10 times the estimated 6.4 percent decrease in the baseline model. The use of Chinese medicine increases by more than 30 percent, also 10 times larger than the 3.2 percent increase estimated in the baseline model. In terms of patient admissions, the probability of admitting high-risk patients decreases by more than 210 percent, which is 15 times the effect observed in the baseline model. For patient outcomes, both the 30-day readmission rate and the in-hospital mortality rate decline significantly, likely driven by changes in patient composition: the substantial reduction in high-risk patients outweighs the expected deterioration in outcomes. The much larger response due to criminal violence lends further support to the salience effect: physicians may overreact to these cases due to increased fear and the dramatic nature of the event, even if the actual risk of malpractice or violent attack does not increase.

[Figure 8 about here]

7.4 Mental v.s. Financial Costs

Lastly, we provide additional evidence and discussion in support of the mental cost channel. The distinction does not affect our conceptual framework, but is important for policy implications. If mental cost is the main driving force of physician behavioral change, it is important to provide additional mental support to physicians and to help them cope with the pressure of negative shocks. In addition, the findings on physician responses through non-pecuniary channels have important implications for tort reforms. First, reforms usually change the exposure of physicians to financial liability, such as non-economic damage caps. A dominant mental cost channel suggests a limited impact of reforms on defensive medicine. Second, tort reforms may not entirely achieve the goal of curbing defensive medicine, because providing leniency to physicians might inadvertently prompt patients to resort to violent threats as a means to express their anger or mete out punishment. This, in turn, could increase physician mental distress, promote more defensive practices, and partially counteract the intended effects of the reforms.

First, recall from Section 2.2 that financial cost is much lower in China and takes only a negligible proportion of hospital revenues and physicians' income, the magnitude of the physician response is comparable, or even greater as compared to the literature in the US setting. This suggests that financial cost does not fully explain the physician's response.

We also leverage the differences in financial costs in different cases. First, as shown in Figure 6, physicians respond similarly to hospital-winning and losing cases, despite the fact that hospitals and physicians incur lower financial costs when they win. The difference in responses between winning and losing cases provides an upper bound for the financial cost channel, which is small and statistically insignificant. In particular, physicians reject more high-risk patients when they win, suggesting that the psychological impact of being sued but not being found liable may be even greater. Second, we compare the treatment effects of lawsuits and violent attacks. Although both impose similar financial costs, violent attacks inflict a much greater psychological shock on physicians. The stark differences in the magnitude of physicians' responses provide strong evidence for the impact of mental costs.

8 Conclusion

We combine a large database of medical claims from China with the universe of malpractice lawsuits to provide new evidence of defensive medicine. First, we show that mental suffering rather than financial loss concerns leads physicians to adopt more conservative treatment behaviors after an adverse event, ultimately negatively affecting patient health outcomes. These effects are short-lived and spillover to other departments within the same hospital. To show that the responses are due to a change in perception in litigation risk, we compare physicians' responses between winning and losing cases, between cases filed due to alleged surgical failures versus other reasons, and between the directly sued department, similar departments, and other departments within the same hospital. These comparisons suggest that changes in physician behavior are unlikely to be driven by medical error correction, changes in hospital protocol, or financial compensation concerns.

We provide novel evidence of bounded rationality, which is consistent with a theoretical framework of short-memory physician learning. Specifically, hospitals with many lawsuits exhibit responses similar to those with fewer lawsuits. In addition, when a patient's death occurs shortly after a physician has experienced a lawsuit, the physician responds by behaving less conservatively, contrasting with their typical tendency to adopt more conservative practices after patient deaths in the absence of a recent lawsuit.

These findings have several policy implications. First, because physicians' behavioral changes are primarily driven by mental distress rather than financial loss, tort reforms that focus solely on monetary compensation may fail to address the root causes of defensive medicine. Second, the heterogeneity in responses across departments and case types suggests that a one-size-fits-all policy approach is unlikely to be effective; instead, targeted interventions that account for local context and specialization are needed. Third, the short-memory nature of physician learning implies that beliefs about litigation risk do not converge over time, highlighting the need for sustained and perhaps recurring interventions—such as institutional support systems and risk mitigation protocols—to stabilize provider behavior and safeguard patient welfare in the long term.

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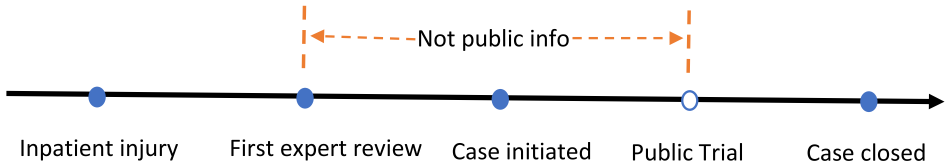


Figure 1: Timeline of Malpractice Lawsuits in China

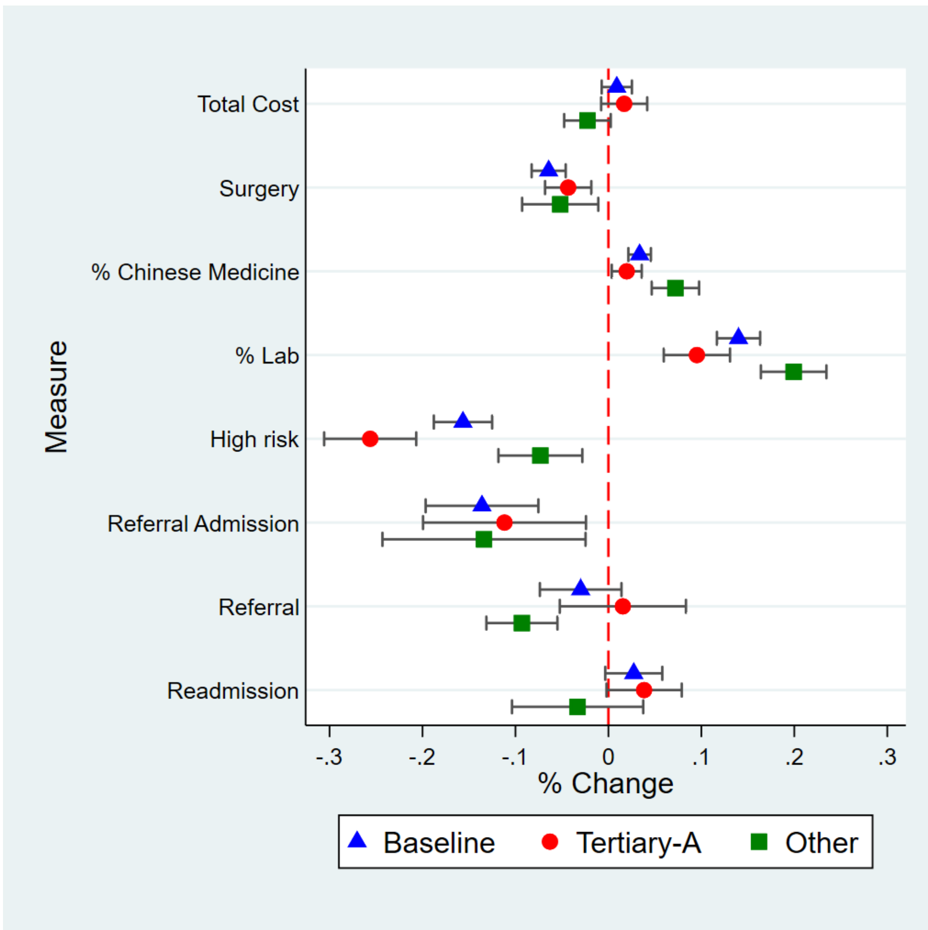
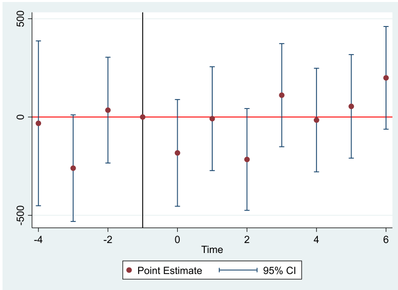
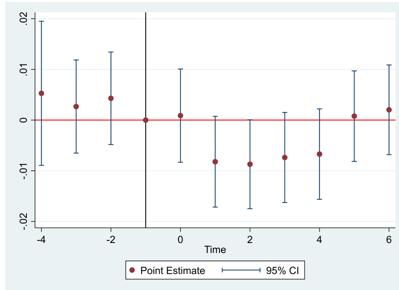


Figure 2: Physician Responses By Hospital Tier

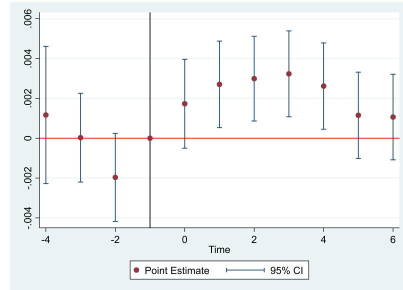
Notes: This figure plots the coefficients estimated with 95% confidence intervals from Equation (3) using two subsamples based on hospital tier. Red dots represent the percent change when the treated hospitals are tertiary. Green squares represent the percent change when the treated hospitals are of lower tier. Blue triangles plot the baseline results using the full sample. Effects reported here are in percent change. Due to scale reasons, we do not plot the likelihood of death. We report all the estimates in Appendix Table B7.



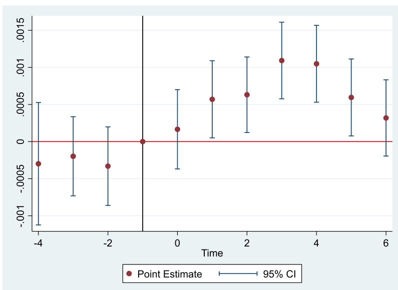
(A) Total Cost



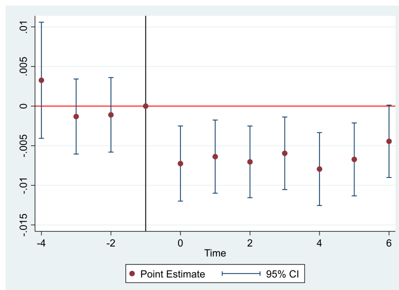
(B) Surgery



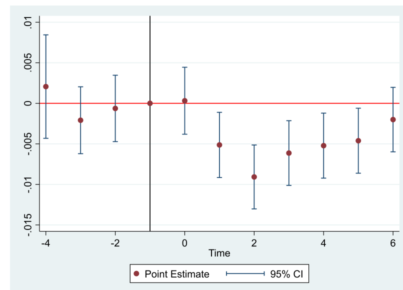
(C) % Chinese Med. Cost



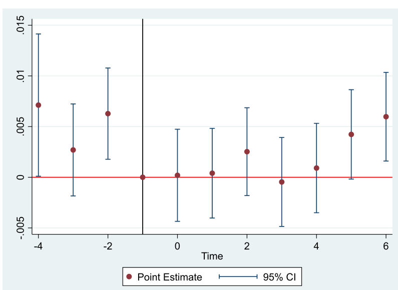
(D) % Lab Cost



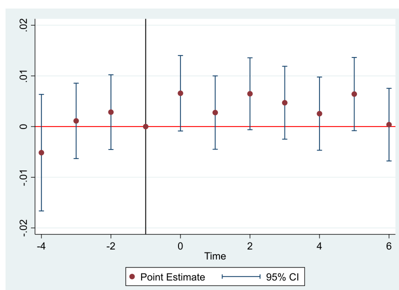
(E) High Risk Admission



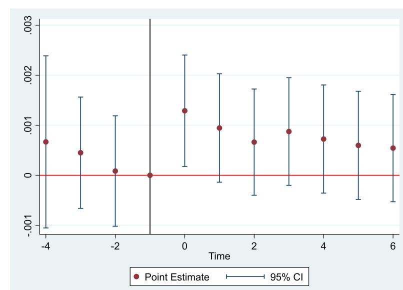
(F) Referral Admission



(G) Referral to Others



(H) 30-Day Readmission



(I) In-Hospital Death

Figure 3: Event Study of Response to Medical Lawsuits

Notes: This figure plots the estimated $\beta_{2t'}$ of Equation (4) with 95% confidence intervals.

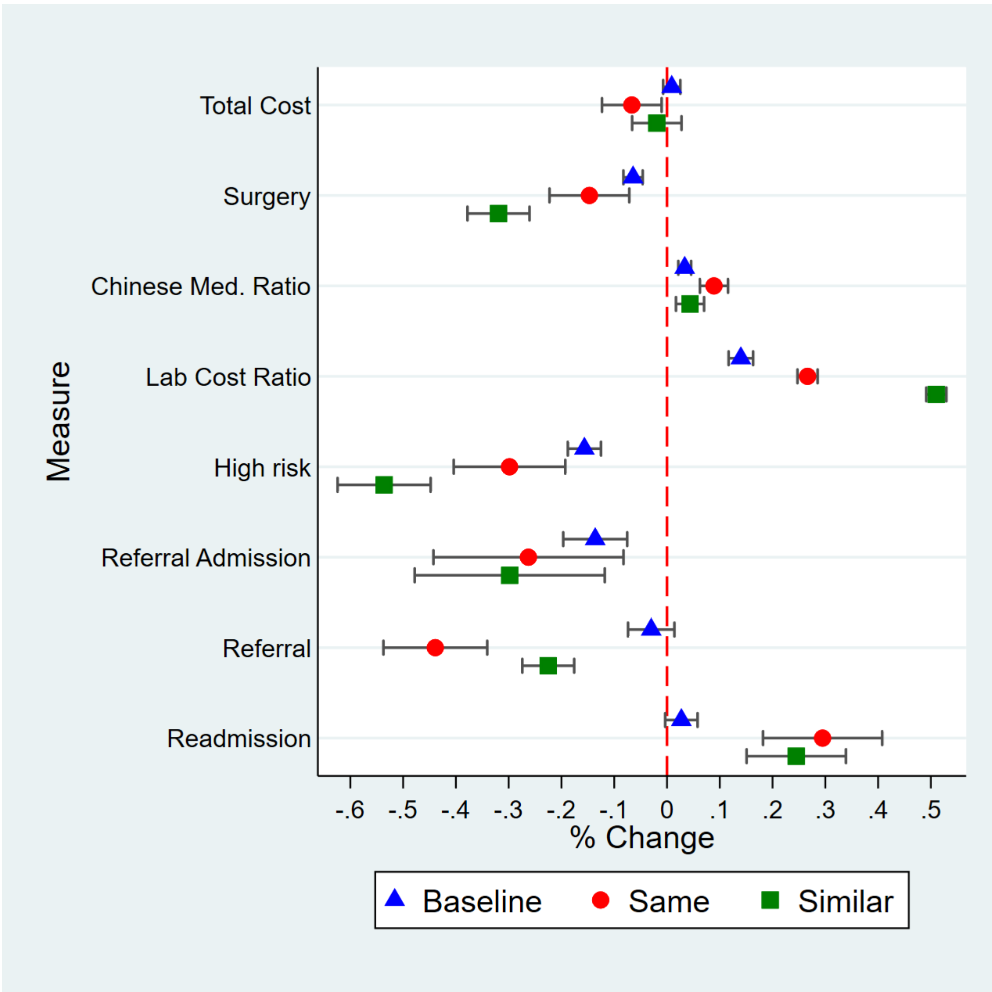


Figure 4: Spillover Effect

Notes: This figure plots the estimated effects of litigation with 95% confidence intervals for the non-sued departments in the same hospital (blue triangles), the sued department (red dots), and departments similar to the sued department (green squares), respectively. Each effect is expressed as a percent change. Effects reported here are in percent change. Due to scale reasons, we do not plot the likelihood of death. We report all the estimates in Appendix Table B8 and B9.

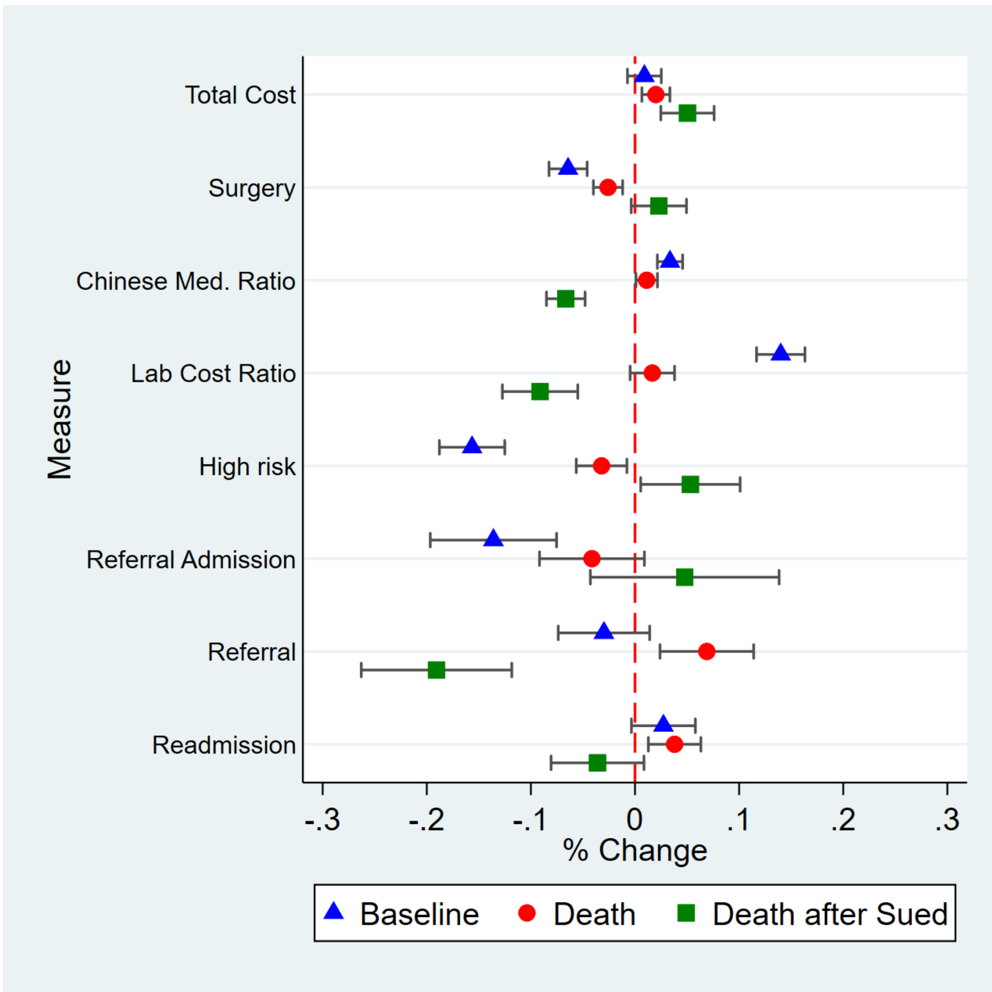


Figure 5: Physician Response to Patients' In-hospital Death

Notes: This figure plots the estimated effects of in-hospital death with 95% confidence intervals when the physicians do not experience a lawsuit around the time of patient death (red dots) and right after physicians experience a lawsuit (green squares). The effects of litigation are in blue triangles for comparison. Effects reported here are in percent change. Due to scale reasons, we do not plot the likelihood of death. We report all the estimates in Appendix Table B10.

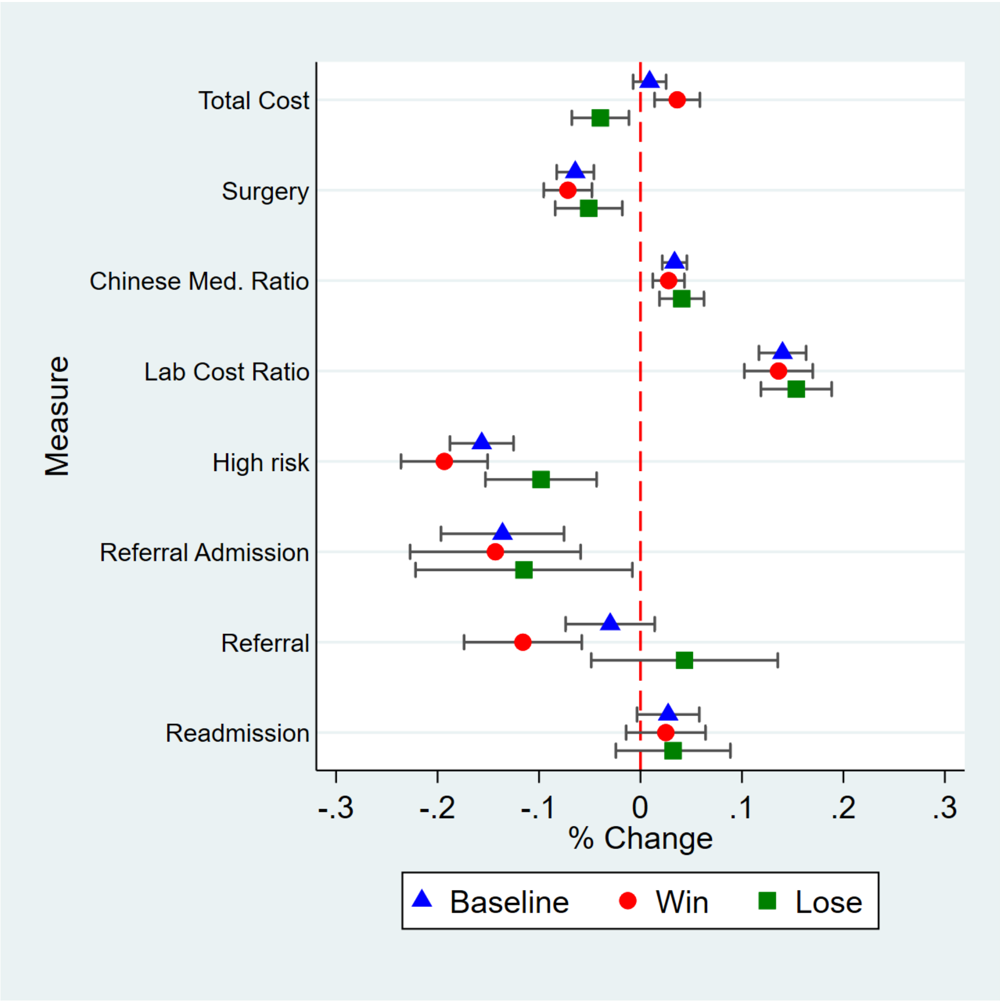


Figure 6: Physician Responses by Case Outcome: Win vs. Lose

Notes: This figure plots the coefficients estimated with 95% confidence intervals from Equation (3) using two subsamples based on case outcomes. Red dots represent the percent change when the hospitals win the cases. Green squares represent the percent change when hospitals lose the cases. Blue triangles plot the baseline results using the full sample. Effects reported here are in percent change. Due to scale reasons, we do not plot the likelihood of death. We report all the estimates in Appendix Table B11.

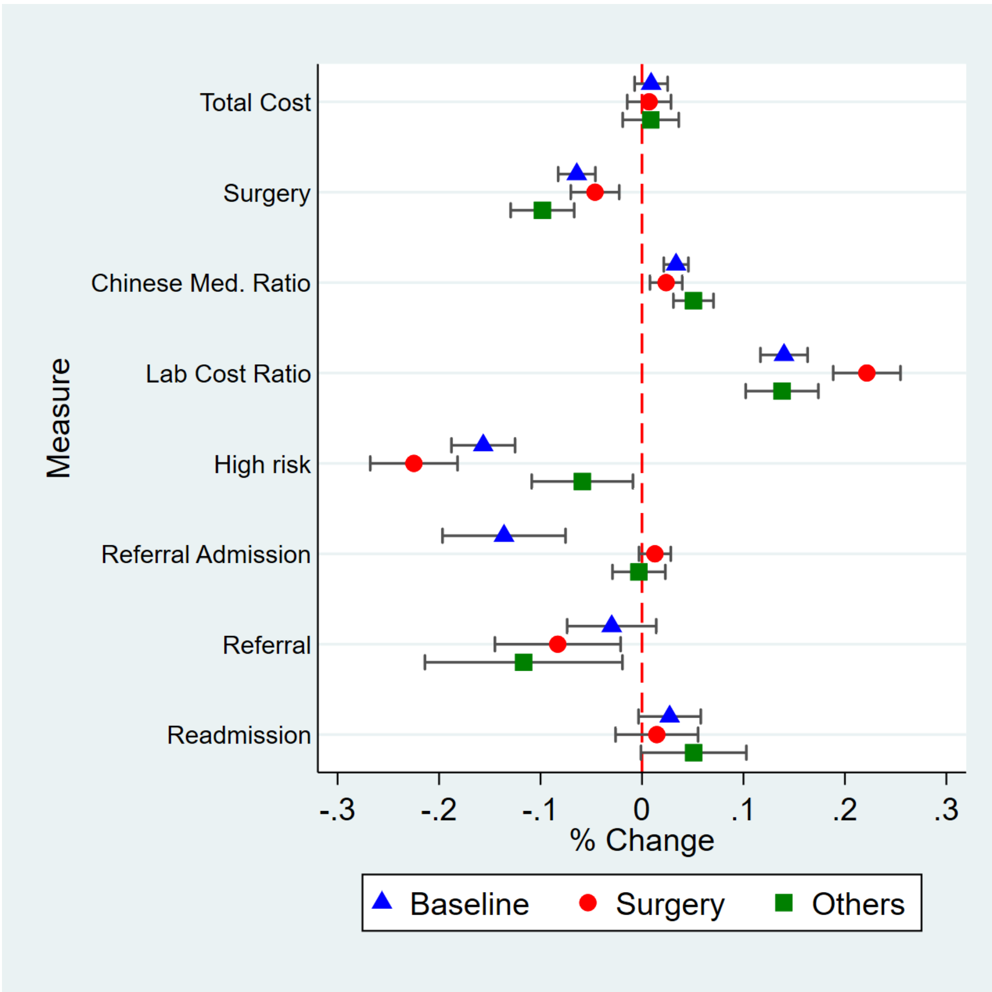


Figure 7: Physician Responses By Alleged Reasons of the Cases

Notes: This figure plots the coefficients estimated with 95% confidence intervals from Equation (3) using two subsamples based on alleged medical errors. Red dots represent the percent change when the alleged error is a failure in surgery. Green squares represent the percent change when the alleged error is inadequate treatment or missed diagnosis. Blue triangles plot the baseline results using the full sample. Effects reported here are in percent change. Due to scale reasons, we do not plot the likelihood of death. We report all the estimates in Appendix Table B12.

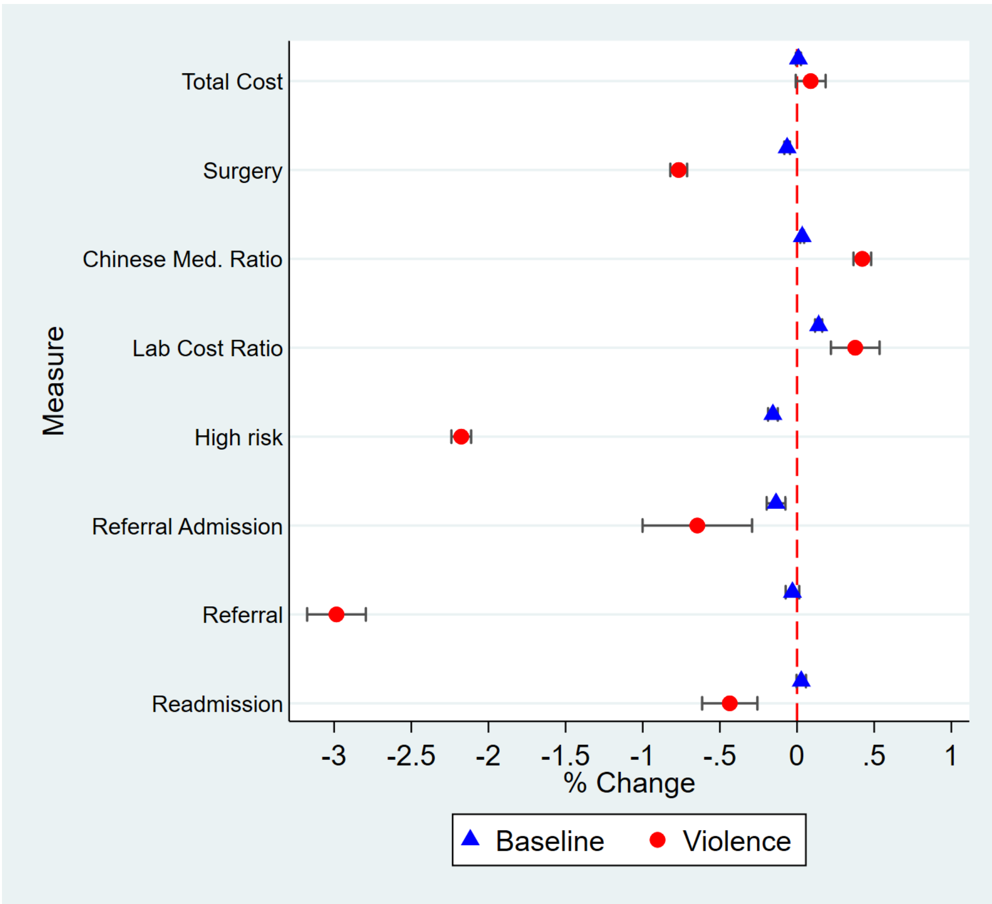


Figure 8: Physician Response to Violent Case

Notes: This figure plots the coefficients estimated with 95% confidence intervals from Equation (7). Red dots represent the responses after the violent attack. Blue triangles plot the baseline results of litigation. Effects reported here are in percent change. Due to scale reasons, we do not plot the likelihood of death. We report all the estimates in Appendix Table B13.

Table 1: Summary Statistics: Medical Malpractice Lawsuits

	All Cases		Winning cases		Losing cases	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
	64	100%	40	63%	24	37%
A. Alleged Error						
Treatment-surgical	29	45%	15	38%	14	58%
Treatment-non-surgical	15	23%	12	30%	3	13%
Diagnosis	20	31%	13	33%	7	29%
B. Type of Injury						
Disablement	41	64%	24	62%	17	68%
Death	23	36%	16	38%	7	32%
C. Alleged Hospital (12 out of 28)						
Tertiary 1	28	44%	19	48%	9	38%
Tertiary 2	15	23%	12	30%	3	13%
Tertiary 3	8	13%	2	5%	6	25%
Secondary 1	3	5%	2	5%	1	4%
Secondary 2	2	3%	2	5%	0	0%
Secondary 3	1	2%	1	3%	0	0%
Secondary 4	1	2%	1	3%	0	0%
Primary 1	2	3%	0	0%	2	8%
Primary 2	1	2%	0	0%	1	4%
Primary 3	1	2%	1	3%	0	0%
Primary 4	1	2%	0	0%	1	4%
Primary 5	1	2%	0	0%	1	4%

Note: Winning cases refer to the cases that were resolved in the hospitals' favor and physicians' liability is less than 30%, i.e., patients receive less than 30% of the settlement amount. Losing cases refer to the cases that were resolved in the plaintiffs' (patients') favor.

Table 2: Summary Statistics: Medical Claims

Variable	Obs	Mean	Std. Dev.	Min	Max
A. Utilization: intensive margins					
Total Cost (CNY)	719,710	7,886.12	12,449.97	0	1,068,212.00
Insurance Cost (CNY)	719,707	4,507.69	7,964.49	0	673,036.50
Out-of-pocket Cost (CNY)	719,683	3,222.40	5,269.05	0	833,887.10
Surgery Dummy	719,710	0.24	0.42	0	1
Surgery Cost (CNY)	719,706	184.90	490.12	0	40,130.00
Surgery Cost Ratio	719,706	0.02	0.06	0	1
Chinese Medicine Cost (CNY)	719,697	382.30	865.16	0	55,296.40
Chinese Medicine Cost Ratio	719,695	0.07	0.10	0	1
Lab Cost (CNY)	719,704	80.89	219.50	0	11,875.00
Lab Cost Ratio	719,702	0.01	0.03	0	1
B. Utilization: extensive margins					
Referral Admission	719,710	0.03	0.18	0	1
Refer to Other Hospitals at Discharge	719,710	0.04	0.20	0	1
High-risk Specialty (Def 1)	719,710	0.04	0.20	0	1
High-risk Specialty (Def 2)	719,710	0.12	0.32	0	1
C. Health Outcome					
30-Day Readmission	719,710	0.10	0.31	0	1
In-hospital Death (%)	719,710	0.20	5.0	0	1

Note: US dollar (USD) ≈ 6.6 Chinese Yuan (CNY) as of 2018. "Surgery Cost Ratio" ("Chinese Medicine Cost Ratio", or "Lab Cost Ratio") denotes the ratio of surgery cost (traditional Chinese medicine cost, or lab cost) to the total medical cost. "High-risk Specialty" is a dummy representing whether the specialty for a visit belongs to those with the highest mortality rates. In Definition 1, we define high risk by considering the top 5 mortality specialties, which include emergency medicine, neurological surgery, cardiovascular surgery, pulmonology, and intensive care unit. Definition 2 expands the scope to the top 10 mortality specialties. This includes the previous five specialties as well as hematology, gastroenterology, endocrinology, neurology, and infection.

Table 3: Baseline Response to Medical Lawsuits: Medical Cost

	(1)	(2)	(3)
	Total Cost	Insurance Cost	Out-of-pocket Cost
After*Lawsuit	70.87	74.93*	-2.77
	(65.33)	(41.49)	(27.83)
Lawsuit	-100.30**	-50.18*	-54.05***
	(48.06)	(30.27)	(20.41)
Patient Age	1,361.00***	1,012.00***	337.40***
	(19.50)	(13.46)	(7.47)
Male	1,008.00***	815.80***	190.80***
	(39.77)	(27.61)	(15.47)
Subsidy	49.36	365.20***	-835.10***
	(61.42)	(43.06)	(22.32)
Insurance Type	-35.91	1,597.00***	-1,750.00***
	(105.00)	(74.53)	(39.14)
Comorbidity	30.16	186.60***	-129.20***
	(40.90)	(29.95)	(14.02)
Constant	3,299.00***	478.80***	2,846.00***
	(63.60)	(43.89)	(24.69)
Mean(Y)	7,874.43	4,522.36	3,205.13
Observations	1,123,997	1,123,997	1,123,997
R-squared	0.113	0.107	0.140
Hospital FE	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3). Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively. Costs are in Chinese Yuan (CNY). 1 US dollar (USD) ≈ 6.6 CNY as of 2018.

Table 4: Baseline Response to Medical Lawsuits: Treatment Choices

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1{Surgery} (%)	Surgery Cost	Surgery Cost Ratio (%)	Chinese Med. Cost	Chinese Med. Ratio (%)	Lab Cost	Lab Cost Ratio (%)
After*Lawsuit	-1.50***	-5.33*	-0.13***	15.62***	0.25***	8.58***	0.14***
	(0.22)	(2.76)	(0.03)	(4.85)	(0.05)	(0.98)	(0.01)
Lawsuit	0.39**	1.51	0.06***	14.45***	-0.08**	-33.70***	-0.43***
	(0.16)	(2.00)	(0.02)	(3.83)	(0.03)	(0.71)	(0.01)
Patient Age	-3.61***	-18.10***	-0.54***	139.10***	1.43***	13.96***	-0.16***
	(0.07)	(0.74)	(0.01)	(1.58)	(0.02)	(0.36)	(0.00)
Male	-4.89***	-38.31***	-0.77***	25.47***	-0.56***	14.57***	0.08***
	(0.12)	(1.45)	(0.01)	(3.46)	(0.04)	(0.64)	(0.01)
Subsidy	-2.20***	-18.82***	-0.21***	14.73***	0.62***	-12.72***	-0.20***
	(0.18)	(2.09)	(0.02)	(4.38)	(0.06)	(1.02)	(0.01)
Insurance Type	-4.92***	-49.88***	-0.60***	61.93***	0.75***	-8.35***	-0.09***
	(0.30)	(3.50)	(0.04)	(8.50)	(0.08)	(1.58)	(0.02)
Comorbidity	-2.35***	-12.10***	-0.42***	52.73***	1.31***	-8.25***	-0.19***
	(0.16)	(1.74)	(0.02)	(2.93)	(0.05)	(0.65)	(0.01)
Constant	39.10***	281.30***	4.69***	-76.22***	2.75***	40.41***	1.64***
	(0.24)	(2.58)	(0.03)	(4.98)	(0.06)	(1.13)	(0.02)
Mean(Y)	23.37	185.39	2.37	386.90	7.35	76.80	1.03
Observations	1,123,997	1,123,997	1,123,994	1,123,997	1,123,994	1,123,997	1,123,994
R-squared	0.194	0.081	0.279	0.082	0.253	0.148	0.187
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3). Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively. Costs are in Chinese Yuan (CNY). 1 US dollar (USD) ≈ 6.6 CNY as of 2018. "Surgery Cost Ratio" ("Chinese Med. Ratio," or "Lab Cost Ratio") denotes the ratio of surgery cost (traditional Chinese medicine cost, or lab cost) to the total medical cost.

Table 5: Baseline Response to Medical Lawsuits: Patient Admission and Referral

	(1)	(2)	(3)	(4)
	Referral Admission (%)	Referral to Others (%)	High Risk 1 (%)	High Risk 2 (%)
After*Lawsuit	-0.44***	-0.12	-0.46***	-1.74***
	(0.10)	(0.09)	(0.13)	(0.18)
Lawsuit	0.33***	-0.45***	0.19**	1.37***
	(0.07)	(0.07)	(0.09)	(0.14)
Patient Age	1.29***	-0.36***	2.14***	4.35***
	(0.03)	(0.04)	(0.04)	(0.06)
Male	0.86***	0.70***	1.98***	2.46***
	(0.05)	(0.06)	(0.07)	(0.12)
Subsidy	1.57***	-0.13*	-0.13	0.94***
	(0.11)	(0.08)	(0.10)	(0.18)
Insurance Type	-2.96***	0.69***	-0.52***	0.53*
	(0.11)	(0.15)	(0.17)	(0.29)
Comorbidity	-0.90***	-0.49***	-0.71***	-0.69***
	(0.05)	(0.05)	(0.06)	(0.08)
Constant	-0.13	4.68***	-2.57***	-3.33***
	(0.09)	(0.12)	(0.12)	(0.20)
Mean(Y)	3.98	3.26	4.43	11.12
Observations	1,123,997	1,123,997	1,123,997	1,123,997
R-squared	0.06	0.08	0.05	0.12
Hospital FE	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3). Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively. “High Risk 1” is a dummy representing whether the specialty for a visit belongs to those with the highest mortality rates according to Definition 1. In Definition 1, we define high risk by considering the top 5 mortality specialties, which include emergency medicine, neurological surgery, cardiovascular surgery, pulmonology, and intensive care unit. Definition 2 expands the scope to the top 10 mortality specialties. This includes the previous five specialties as well as hematology, gastroenterology, endocrinology, neurology, and infection. “High Risk 2” is based on Definition 2.

Table 6: Surgery Response to Medical Lawsuits by Patient Risk Type

	Risk Def. 1 (Y: $\mathbf{1}\{\text{Surgery}\}$ (%))		Risk Def. 2 (Y: $\mathbf{1}\{\text{Surgery}\}$ (%))	
	High Risk	Low Risk	High Risk	Low Risk
After*Lawsuit	0.32	-1.64***	0.16	-2.04***
	(0.87)	(0.23)	(0.45)	(0.25)
Lawsuit	-0.36	0.51***	0.22	0.87***
	(0.60)	(0.17)	(0.31)	(0.18)
Patient Age	-3.57***	-3.59***	-1.08***	-3.26***
	(0.34)	(0.07)	(0.17)	(0.07)
Male	2.51***	-5.19***	2.17***	-5.41***
	(0.57)	(0.12)	(0.28)	(0.13)
Subsidy	-3.48***	-2.12***	-2.88***	-1.84***
	(1.02)	(0.18)	(0.55)	(0.19)
Insurance Type	-8.71***	-4.77***	-4.68***	-4.87***
	(1.35)	(0.31)	(0.64)	(0.33)
Comorbidity	5.67***	-2.50***	7.96***	-2.66***
	(1.46)	(0.16)	(0.97)	(0.17)
Constant	34.40***	39.30***	16.10***	39.60***
	(1.33)	(0.24)	(0.69)	(0.25)
Mean(Y)	20.41	23.63	11.40	25.11
Observations	50,089	1,073,904	125,345	998,652
R-squared	0.07	0.20	0.04	0.21
Hospital FE	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3), using the dummy for surgery as the dependent variable. The two definitions of risk follow those under Table 5. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively.

Table 7: Baseline Response to Medical Lawsuits: Patient Outcome

	(1)	(2)
	30-Day Readmission (%)	Death (%)
After*Lawsuit	0.28*	0.02
	(0.16)	(0.02)
Lawsuit	-0.40***	-0.02
	(0.13)	(0.02)
Patient Age	2.02***	0.14***
	(0.07)	(0.01)
Male	1.01***	0.09***
	(0.14)	(0.01)
Subsidy	3.38***	0.04*
	(0.27)	(0.02)
Insurance Type	-0.60*	0.01
	(0.35)	(0.03)
Comorbidity	-0.35**	-0.03*
	(0.15)	(0.02)
Constant	3.61***	-0.26***
	(0.26)	(0.02)
Mean(Y)	10.41	0.21
Observations	1,123,997	1,123,997
R-squared	0.03	0.01
Hospital FE	Yes	Yes
Case*Date FE	Yes	Yes
Other Patient Characteristics	Yes	Yes

Note: This table reports the results of estimating Equation (3). Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively.

Appendix A:

Proof: The FOC of the physician's utility maximization problem yields:

$$e - C_d \mu_t^d f'(x_t^*) - C_s \mu_t^d \mu_t^s \big(f'(x_t^*) g(x_t^*) + f(x_t^*) g'(x_t^*)\big) + F'(x_t^*) = 0$$

where the optimal treatment level $x_t^*(e, \mathcal{H}_t)$ is a function of the patient's type and the event history. Take the inverse of the FOC and define the "optimal-treatment-equivalent" e^* as:

$$e^*(x, \mathcal{H}_t) = C_d \mu_t^d f'(x) + C_s \mu_t^d \mu_t^s \big(f'(x) g(x) + f(x) g'(x)\big) - F'(x)$$

We have that

$$\frac{\partial e^*(x, \mathcal{H}_t)}{\partial x} > 0, \forall \mathcal{H}_t, x$$

Thus, to show that the physician becomes more aggressive with history $\mathcal{H}'$ than with $\mathcal{H}$, it is equivalent to show that $e^*(x, \mathcal{H}') < e^*(x, \mathcal{H})$, $\forall x$, or vice versa. That is, given the level of riskiness of treatment x, the FOC condition implies that the current level of x is only suitable for a patient type with lower e^* under $\mathcal{H}'$. Therefore, given the current patient type and that e^* is increasing in x, x must be increased to maintain optimal condition.

Proposition 1 First, note that

$$\begin{aligned}
&e^*(x, \mathcal{H}_t) - e^*(x, \mathcal{H}_{t-1}) \\
&= \left[C_d \mu_t^d f'(x) + C_s \mu_t^d \mu_t^s \big(f'(x) g(x) + f(x) g'(x)\big)\right] - \left[C_d \mu_{t-1}^d f'(x) + C_s \mu_{t-1}^d \mu_{t-1}^s \big(f'(x) g(x) + f(x) g'(x)\big)\right] \\
&= C_d f'(x) \big(\mu_t^d - \mu_{t-1}^d\big) + C_s \big(f'(x) g(x) + f(x) g'(x)\big)\big(\mu_t^d \mu_t^s - \mu_{t-1}^d \mu_{t-1}^s\big)
\end{aligned}$$

Based on a good patient outcome, we have $\mu_t^d < \mu_{t-1}^d, \mu_t^s = \mu_{t-1}^s$. Thus $e^*(x, \mathcal{H}_t) < e^*(x, \mathcal{H}_{t-1})$, $\forall x$. The physicians become more aggressive after a good patient outcome.

Proposition 2(1) We have $\mu_t^d > \mu_{t-1}^d, \mu_t^s > \mu_{t-1}^s$. Thus $e^*(x, \mathcal{H}_t) > e^*(x, \mathcal{H}_{t-1})$, $\forall x$. The physicians become more conservative after a lawsuit.

Proposition 2(2) First, denote that $D_t = \sum_{k=1}^t \rho^{t-k} d_k$, $S_t = \sum_{k=1}^t \rho^{t-k} s_k$, and $T_t = \sum_{k=1}^t \rho^{t-k}$. By iteration,

$$\begin{aligned}
a_{t-1} &= \rho a_{t-2} + d_{t-1} \\
&= \rho^2 a_{t-3} + \rho d_{t-2} + d_{t-1} \\
&= \rho^3 a_{t-4} + \rho^2 d_{t-3} + \rho d_{t-2} + d_{t-1} \\
&= \rho^{t-1} a_0 + \sum_{k=1}^{t-1} \rho^{t-k-1} d_k \\
&= \rho^{t-1} a_0 + D_{t-1}, \\
b_{t-1} &= \rho^{t-1} b_0 + T_{t-1} - D_{t-1}, \\
\alpha_{t-1} &= \rho^{t-1} \alpha_0 + S_{t-1}, \\
\beta_{t-1} &= \rho^{t-1} \beta_0 + D_{t-1} - S_{t-1}.
\end{aligned}$$

When $\rho = 1$ we have

$$\begin{aligned}
\mu_t^d - \mu_{t-1}^d &= \frac{a_{t-1}+1}{a_{t-1}+b_{t-1}+1} - \frac{a_{t-1}}{a_{t-1}+b_{t-1}} \\
&= \frac{b_{t-1}}{(a_{t-1}+b_{t-1}+1)(a_{t-1}+b_{t-1})} \\
&= \frac{\rho^{t-1} b_0 + T_{t-1} - D_{t-1}}{(\rho^{t-1}(a_0+b_0)+T_t)(\rho^{t-1}(a_0+b_0)+T_{t-1})},
\end{aligned}$$

which decreases in the total number of patient deaths in history D_{t-1}. And,

$$\begin{aligned}
\mu_t^s - \mu_{t-1}^s &= \frac{\alpha_{t-1}+1}{\alpha_{t-1}+\beta_{t-1}+1} - \frac{\alpha_{t-1}}{\alpha_{t-1}+\beta_{t-1}} \\
&= \frac{\beta_{t-1}}{(\alpha_{t-1}+\beta_{t-1}+1)(\alpha_{t-1}+\beta_{t-1})} \\
&= \frac{\rho^{t-1} \beta_0 + D_{t-1} - S_{t-1}}{(\rho^{t-1}(\alpha_0+\beta_0)+D_{t-1}+1)(\rho^{t-1}(\alpha_0+\beta_0)+D_{t-1})},
\end{aligned}$$

which decreases in the total number of patient deaths in history D_{t-1}, and total number of lawsuits in history S_{t-1}.

Thus, $e^*(x, \mathcal{H}_t) - e^*(x, \mathcal{H}_{t-1})$ decreases in D_{t-1} and S_{t-1}, and therefore $|x^*(e, \{\mathcal{H}_{t-1}, (1,1)\}) - x^*(e, \mathcal{H}_{t-1})|$ decreases in D_{t-1} and S_{t-1}.

To demonstrate that the outcome may not be valid for $\rho < 1$, one can examine the extreme scenario where $\rho = 0$. In this case, the comparison of the two periods relies solely on the events occurring in those periods, independent of the cumulative history.

Proposition 3(1) It is straightforward to show that $\mu_t^d(\{\mathcal{H}_{t-1}, (1,1)\}) = \mu_t^d(\{\mathcal{H}_{t-1}, (1,0)\})$, $\mu_t^s(\{\mathcal{H}_{t-1}, (1,1)\}) > \mu_t^s(\{\mathcal{H}_{t-1}, (1,0)\})$. Thus, physicians behave less conservatively in facing a patient's death without a lawsuit compared to when they face a lawsuit.

Proposition 3(2) We have $\mu_t^d > \mu_{t-1}^d, \mu_t^s < \mu_{t-1}^s$. First, to demonstrate that the sign of $x^*(\{\mathcal{H}_{t-1},(1,0)\}) - x^*(e,\mathcal{H}_{t-1})$ is undermined, consider two extreme cases: when $C_d = 0$, i.e., the physician incurs no cost on patient death, we have $e^*(x,\mathcal{H}_t) < e^*(x,\mathcal{H}_{t-1})$, $\forall x$— the physicians become more aggressive after a patient death; when $C_s = 0$, i.e., the physician incurs no cost on lawsuit, we have $e^*(x,\mathcal{H}_t) > e^*(x,\mathcal{H}_{t-1})$, $\forall x$— the physicians become more conservative after a patient death.

Second, to show that $x^*(e,\{\mathcal{H}_{t-1},(1,0)\}) - x^*(e,\mathcal{H}_{t-1})$ increases in S_{t-1}, it is equivalent to show that $e^*(x,\mathcal{H}_t) - e^*(x,\mathcal{H}_{t-1})$ decreases in S_{t-1}. Note that

$$\begin{aligned}
&e^*(x,\mathcal{H}_t) - e^*(x,\mathcal{H}_{t-1})\\
&= C_d f'(x)\big(\mu_t^d - \mu_{t-1}^d\big) + C_s\big(f'(x)g(x) + f(x)g'(x)\big)\big(\mu_t^d\mu_t^s - \mu_{t-1}^d\mu_{t-1}^s\big),
\end{aligned}$$

among which,

$$\mu_t^d - \mu_{t-1}^d = \frac{\rho a_{t-1}+1}{\rho a_{t-1}+\rho b_{t-1}+1} - \frac{a_{t-1}}{a_{t-1}+b_{t-1}} > 0, \text{independent of } S_{t-1}.$$

$$\mu_t^d\mu_t^s - \mu_{t-1}^d\mu_{t-1}^s$$

$$= \frac{(\rho a_{t-1}+1)\rho\alpha_{t-1}}{(\rho a_{t-1}+\rho b_{t-1}+1)(\rho\alpha_{t-1}+\rho\beta_{t-1}+1)} - \frac{a_{t-1}\alpha_{t-1}}{(a_{t-1}+b_{t-1})(\alpha_{t-1}+\beta_{t-1})}$$

$$= \frac{\alpha_{t-1}\Big(\rho b_{t-1}(\alpha_{t-1}+\beta_{t-1}) - \rho a_{t-1}(a_{t-1}+b_{t-1}) - a_{t-1}\Big)}{(\rho a_{t-1}+\rho b_{t-1}+1)(\rho\alpha_{t-1}+\rho\beta_{t-1}+1)(a_{t-1}+b_{t-1})(\alpha_{t-1}+\beta_{t-1})}$$

$$= \frac{\alpha_{t-1}\Big(\rho\big(\rho^{t-1}b_0 + T_{t-1} - D_{t-1}\big)\big(\rho^{t-1}(\alpha_0+\beta_0) + D_{t-1}\big) - \rho\big(\rho^{t-1}a_0 + D_{t-1}\big)\big(\rho^{t-1}(a_0+b_0) + T_{t-1}\big) - a_{t-1}\Big)}{(\rho^t(a_0+b_0) + \rho T_{t-1}+1)(\rho^t(\alpha_0+\beta_0) + \rho D_{t-1}+1)(\rho^{t-1}(a_0+b_0) + T_{t-1})(\rho^{t-1}(\alpha_0+\beta_0) + D_{t-1})}.$$

With long enough time, the prior becomes trivial enough such that $\rho^t \to 0$, and therefore we have

$$\begin{aligned}
\mu_t^d\mu_t^s - \mu_{t-1}^d\mu_{t-1}^s &\to \frac{S_{t-1}\Big(\rho(T_{t-1}-D_{t-1})D_{t-1} - \rho D_{t-1}T_{t-1}) - D_{t-1}\Big)}{(\rho T_{t-1}+1)(\rho D_{t-1}+1)T_{t-1}D_{t-1}}\\
&= \frac{S_{t-1}(-\rho D_{t-1}^2 - D_{t-1})}{(\rho T_{t-1}+1)(\rho D_{t-1}+1)T_{t-1}D_{t-1}},
\end{aligned}$$

which is negative and strictly decreases in S_{t-1}.

Appendix B:

Table B1: Robustness Check: Treatment Choice Responses By Specialties

	Cardiovascular		Ob-Gyn	
	1{Surgery} (%)	Surgery Cost	**1**{Surgery} (%)	Surgery Cost
After*Lawsuit	0.54*	1.79	1.47	7.99
	(0.32)	(3.37)	(1.06)	(12.62)
Lawsuit	-0.23	-3.90	-1.60*	-19.74**
	(0.25)	(2.68)	(0.85)	(9.78)
Patient Age	-1.15***	-11.79***	-0.40	55.48***
	(0.18)	(1.72)	(0.78)	(11.55)
Male	0.67***	7.25***	-45.60*	-204.20
	(0.24)	(2.57)	(24.80)	(193.70)
Subsidy	-0.53	7.13	-1.46*	-54.12***
	(0.53)	(7.81)	(0.83)	(11.68)
Insurance Type	-0.04	2.05	-96.90***	-623.80***
	(0.56)	(5.67)	(1.09)	(14.64)
Comorbidity	1.68***	18.32***	0.40	99.59***
	(0.59)	(6.38)	(0.34)	(9.59)
Constant	8.89***	67.30***	31.70***	458.00***
	(0.78)	(7.26)	(5.19)	(23.09)
Mean(Y)	4.78	28.91	57.36	577.61
% Change	0.11	0.06	0.03	0.01
Observations	69,591	69,591	21,440	21,440
R-squared	0.01	0.01	0.14	0.06
Hospital FE	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3). Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively. Costs are in Chinese Yuan (CNY). 1 US dollar (USD) $\approx$ 6.6 CNY as of 2018.

Table B2: Patient Volume Change After Lawsuits

	(1)	(2)
	Number of Patients	Log(Number of Patients)
After*Lawsuit	2.37	0.03
	(1.70)	(0.03)
Constant	10.74***	1.52***
	(0.02)	(0.00)
Observations	89,076	89,076
R-squared	0.93	0.81
Case*Hospital FE	Yes	Yes
Case*Date FE	Yes	Yes

Note: This table reports the results of regressing the biweekly number of inpatients on the DID term, $\mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\}$, in Equation (3), including hospital-by-case and day-by-case fixed effects. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively.

Table B3: Robustness Check: Medical Cost

	(1)	(2)	(3)
	Total Cost	Insurance Cost	Out-of-pocket Cost
After*Lawsuit	98.94	27.94	74.82***
	(66.61)	(43.18)	(27.81)
Lawsuit	-106.40*	-5.63	-125.30***
	(60.77)	(39.04)	(24.96)
Patient Age	877.10***	731.30***	145.40***
	(18.80)	(13.84)	(6.360)
Male	587.10***	520.20***	80.14***
	(35.75)	(26.21)	(12.20)
Subsidy	234.90***	391.30***	-552.90***
	(52.58)	(39.85)	(15.72)
Insurance Type	222.20**	1,115.00***	-978.90***
	(106.90)	(80.46)	(34.80)
Comorbidity	-123.70***	-7.76	-83.12***
	(36.91)	(26.97)	(12.43)
Constant	2,892.00***	686.50***	2,184.00***
	(62.58)	(45.54)	(21.97)
Mean(Y)	5992.09	3561.53	2235.88
Observations	556,716	556,716	556,716
R-squared	0.11	0.11	0.14
Hospital FE	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3), with observations in the control hospitals of the same or higher tier excluded. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively. Costs are in Chinese Yuan (CNY). 1 US dollar (USD) ≈ 6.6 CNY as of 2018.

Table B4: Robustness Check: Treatment Choices

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1{Surgery} (%)	Surgery Cost	Surgery Cost Ratio (%)	Chinese Med. Cost	Chinese Med. Ratio (%)	Lab Cost	Lab Cost Ratio (%)
After*Lawsuit	-2.09***	-8.89***	-0.20***	7.61	0.29***	13.80***	0.19***
	(0.24)	(2.97)	(0.03)	(4.92)	(0.05)	(1.00)	(0.01)
Lawsuit	-0.64**	-17.65***	-0.07*	51.21***	1.05***	-11.59***	-0.20***
	(0.27)	(3.17)	(0.04)	(3.85)	(0.06)	(0.73)	(0.01)
Patient Age	-4.16***	-22.87***	-0.62***	113.90***	1.68***	3.98***	-0.10***
	(0.08)	(0.87)	(0.01)	(1.42)	(0.02)	(0.23)	(0.00)
Male	-4.19***	-26.62***	-0.72***	6.58**	-0.80***	8.10***	0.07***
	(0.14)	(1.61)	(0.02)	(2.81)	(0.05)	(0.39)	(0.01)
Subsidy	-1.57***	-14.89***	-0.16***	26.29***	0.89***	-4.91***	-0.11***
	(0.18)	(1.92)	(0.02)	(3.66)	(0.07)	(0.55)	(0.01)
Insurance Type	-5.55***	-47.27***	-0.83***	62.01***	0.89***	-5.30***	-0.08***
	(0.35)	(3.56)	(0.05)	(7.37)	(0.10)	(1.02)	(0.01)
Comorbidity	-3.18***	-18.12***	-0.55***	59.48***	1.69***	-4.97***	-0.09***
	(0.18)	(1.89)	(0.03)	(2.68)	(0.06)	(0.40)	(0.01)
Constant	41.50***	281.30***	5.39***	-80.98***	2.76***	20.07***	0.86***
	(0.29)	(3.14)	(0.04)	(4.50)	(0.08)	(0.77)	(0.01)
Mean(Y)	23.31	185.39	2.35	386.92	7.36	76.77	1.00
Observations	556,716	556,716	556,714	556,716	556,714	556,716	556,714
R-squared	0.32	0.15	0.38	0.12	0.30	0.13	0.16
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3), with observations in the control hospitals of the same or higher tier excluded. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively. Costs are in Chinese Yuan (CNY). 1 US dollar (USD) ≈ 6.6 CNY as of 2018. "Surgery Cost Ratio" (" Chinese Med Ratio," or " Lab Cost Ratio") denotes the ratio of surgery cost (traditional Chinese medicine cost, or lab cost) to the total medical cost.

Table B5: Robustness Check: Patient Admission and Referral

	(1)	(2)	(3)	(4)
	Referral Admission (%)	Referral to Others (%)	High Risk 1 (%)	High Risk 2 (%)
After*Lawsuit	-0.49***	-0.51***	-0.26**	-1.88***
	(0.11)	(0.09)	(0.13)	(0.18)
Lawsuit	0.82***	-1.78***	0.21	1.71***
	(0.10)	(0.07)	(0.13)	(0.16)
Patient Age	0.62***	-0.12***	1.28***	2.43***
	(0.02)	(0.03)	(0.03)	(0.05)
Male	0.40***	0.26***	1.02***	1.24***
	(0.04)	(0.04)	(0.06)	(0.08)
Subsidy	1.00***	-0.06	-0.20***	0.18*
	(0.09)	(0.06)	(0.07)	(0.10)
Insurance Type	-1.78***	-0.10	-0.40***	0.07
	(0.09)	(0.10)	(0.14)	(0.21)
Comorbidity	-0.81***	-0.48***	-0.86***	-0.97***
	(0.05)	(0.05)	(0.06)	(0.06)
Constant	-0.04	2.82***	-1.48***	-2.29***
	(0.08)	(0.09)	(0.10)	(0.14)
Mean(Y)	4.01	0.19	4.43	11.10
Observations	556,716	556,716	556,716	556,716
R-squared	0.06	0.08	0.06	0.16
Hospital FE	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3), with observations in the control hospitals of the same or higher tier excluded. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively. "High Risk 1" is a dummy representing whether the specialty for a visit belongs to those with the highest mortality rates according to Definition 1. In Definition 1, we define high risk by considering the top 5 mortality specialties, which include emergency medicine, neurological surgery, cardiovascular surgery, pulmonology, and intensive care unit. Definition 2 expands the scope to the top 10 mortality specialties. This includes the previous five specialties as well as hematology, gastroenterology, endocrinology, neurology, and infection. "High Risk 2" is based on Definition 2.

Table B6: Robustness Check: Patient Outcome

	(1)	(2)
	30-Day Readmission (%)	Death (%)
After*Lawsuit	0.28	0.03
	(0.19)	(0.02)
Lawsuit	-0.87***	-0.02
	(0.22)	(0.02)
Patient Age	2.61***	0.09***
	(0.08)	(0.01)
Male	2.13***	0.06***
	(0.16)	(0.01)
Subsidy	3.49***	0.04**
	(0.27)	(0.02)
Insurance Type	-0.01	-0.03
	(0.34)	(0.02)
Comorbidity	0.23	-0.01
	(0.17)	(0.02)
Constant	0.83***	-0.17***
	(0.28)	(0.02)
Mean(Y)	10.41	0.23
Observations	556,716	556,716
R-squared	0.03	0.01
Hospital FE	Yes	Yes
Case*Date FE	Yes	Yes
Other Patient Characteristics	Yes	Yes

Note: This table reports the results of estimating Equation (3), with observations in the control hospitals of the same or higher tier excluded. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively.

Table B7: Heterogeneous Response to Medical Lawsuits: By Hospital Tier

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total Cost	**1**{Surgery} (%)	Chinese Med. Ratio (%)	Lab Cost Ratio (%)	High Risk 1 (%)	Refer Ad. (%)	Refer to Others (%)	Readmission (%)	Death (%)
				Tertiary Hospitals					
After*Lawsuit	133.51	-1.01***	0.15**	0.10***	-2.85***	-0.36**	0.06	0.40*	0.03
	(99.51)	(0.30)	(0.06)	(0.02)	(0.28)	(0.15)	(0.14)	(0.21)	(0.03)
Lawsuit	-109.00	0.60***	-0.26***	-0.12***	0.93***	0.21**	-0.74***	-0.14	-0.05**
	(70.94)	(0.22)	(0.05)	(0.01)	(0.21)	(0.10)	(0.10)	(0.18)	(0.02)
Patient Age	1,945.00***	-3.16***	1.17***	-0.23***	7.08***	2.30***	-0.78***	1.21***	0.20***
	(30.82)	(0.09)	(0.02)	(0.01)	(0.11)	(0.05)	(0.06)	(0.11)	(0.01)
Male	1,684.00***	-5.61***	-0.33***	0.12***	4.51***	1.57***	1.30***	-0.92***	0.14***
	(66.27)	(0.19)	(0.05)	(0.01)	(0.22)	(0.09)	(0.12)	(0.22)	(0.02)
Subsidy	-746.80***	-3.67***	-0.12	-0.16***	4.19***	3.42***	-0.87***	2.69***	0.03
	(142.73)	(0.41)	(0.09)	(0.03)	(0.50)	(0.29)	(0.21)	(0.60)	(0.05)
Insurance Type	-538.40***	-5.25***	0.77***	-0.01	0.60	-3.90***	1.37***	-1.16**	0.04
	(161.60)	(0.45)	(0.11)	(0.03)	(0.50)	(0.20)	(0.27)	(0.55)	(0.04)
Comorbidity	1,990.00***	-0.31	-0.54***	-0.52***	1.15***	1.23***	-0.39**	-3.50***	-0.18***
	(165.70)	(0.48)	(0.09)	(0.04)	(0.38)	(0.22)	(0.17)	(0.37)	(0.03)
Constant	4,612.00***	38.30***	2.13***	2.38***	7.33***	-0.35***	-0.64***	8.20***	-3.24***
	(109.30)	(0.36)	(0.07)	(0.03)	(0.40)	(0.04)	(0.17)	(0.21)	(0.36)
Observations	583,378	583,378	583,378	583,378	583,378	583,378	583,378	583,378	583,378
R-squared	0.04	0.03	0.07	0.16	0.05	0.07	0.06	0.02	0.01
				Primary and Secondary Hospitals					
After*Lawsuit	-177.49*	-1.21**	0.53***	0.21***	-0.81***	-0.44**	-0.37***	-0.35	0.01
	(100.61)	(0.49)	(0.10)	(0.02)	(0.26)	(0.18)	(0.08)	(0.38)	(0.02)
Lawsuit	-99.61	-0.73**	0.62***	-0.15***	1.01***	0.49***	-1.61***	-0.26	0.01
	(75.14)	(0.36)	(0.07)	(0.01)	(0.19)	(0.13)	(0.06)	(0.29)	(0.01)
Patient Age	523.70***	-4.80***	1.77***	-0.01***	0.49***	0.20***	0.02	3.11***	0.05***
	(20.84)	(0.09)	(0.03)	(0.00)	(0.03)	(0.02)	(0.02)	(0.09)	(0.01)
Male	221.80***	-3.95***	-0.83***	0.02***	0.20***	0.01	-0.02	3.21***	0.03***
	(37.08)	(0.15)	(0.05)	(0.00)	(0.05)	(0.04)	(0.03)	(0.17)	(0.01)
Subsidy	697.01***	-1.71***	0.92***	-0.08***	-0.11	1.29***	-0.04	3.35***	0.05**
	(54.36)	(0.18)	(0.07)	(0.01)	(0.07)	(0.08)	(0.05)	(0.27)	(0.02)
Insurance Type	281.00**	-6.48***	0.83***	-0.03**	-0.56***	-0.51***	-0.66***	0.88**	-0.05**
	(123.20)	(0.40)	(0.12)	(0.01)	(0.11)	(0.07)	(0.08)	(0.39)	(0.02)
Comorbidity	-210.30***	-3.42***	1.55***	-0.05***	-0.76***	-0.25***	-0.77***	0.50***	-0.02
	(38.63)	(0.17)	(0.05)	(0.01)	(0.06)	(0.04)	(0.05)	(0.17)	(0.02)
Constant	2,845***	43.20***	3.19***	0.41***	-1.44***	-0.06**	0.01	1.33***	0.02
	(66.68)	(0.31)	(0.09)	(0.01)	(0.30)	(0.02)	(0.06)	(0.07)	(0.08)
Observations	540,619	540,619	540,616	540,616	540,619	540,619	540,619	540,619	540,619
R-squared	0.18	0.38	0.32	0.17	0.05	0.03	0.10	0.04	0.01
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3) with two subsamples. The upper panel displays the results using cases when tertiary hospitals are the treated hospitals. The lower panel shows results when lower-tier hospitals are treated. Other patient characteristics include profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table B8: Heterogeneous Response to Medical Lawsuits: Spillover Effect to Non-sued Departments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total Cost	**1**{Surgery} (%)	Chinese Med. Ratio (%)	Lab Cost Ratio (%)	High Risk 1 (%)	Refer Ad. (%)	Refer to Others (%)	Readmission (%)	Death (%)
Response in Non-sued Dept	101.03	-1.37***	0.23***	0.14***	-1.92***	-0.42***	-0.05	0.16	0.03
*After*Lawsuit*	(66.25)	(0.22)	(0.05)	(0.01)	(0.18)	(0.10)	(0.09)	(0.17)	(0.02)
Response Diff b/w Sued and Non-sued	-625.71***	-2.07**	0.43***	0.14***	-1.32***	-0.43	-1.70***	2.91***	-0.05
*After*Lawsuit*Same Dept*	(228.50)	(0.90)	(0.14)	(0.04)	(0.19)	(0.34)	(0.19)	(0.64)	(0.04)
Lawsuit	-158.10***	-0.32**	-0.03	-0.43***	1.41***	0.30***	-0.38***	-0.35***	-0.02
	(48.18)	(0.16)	(0.03)	(0.01)	(0.14)	(0.07)	(0.07)	(0.13)	(0.02)
Sued Department	1,615.00***	19.60***	-1.35***	0.07***	4.20***	0.66***	-1.94***	-1.64***	-0.02
	(80.25)	(0.30)	(0.05)	(0.01)	(0.63)	(0.13)	(0.10)	(0.23)	(0.02)
Patient Age	1,362.00***	-3.59***	1.43***	-0.16***	4.35***	1.29***	-0.37***	2.02***	0.14***
	(19.49)	(0.07)	(0.02)	(0.00)	(0.06)	(0.03)	(0.04)	(0.07)	(0.01)
Male	1,018.00***	-4.76***	-0.57***	0.08***	2.46***	0.87***	0.68***	1.01***	0.09***
	(39.78)	(0.12)	(0.04)	(0.01)	(0.12)	(0.05)	(0.06)	(0.14)	(0.01)
Subsidy	59.11	-2.08***	0.61***	-0.20***	0.93***	1.57***	-0.15*	3.38***	0.04*
	(61.38)	(0.18)	(0.06)	(0.01)	(0.18)	(0.11)	(0.08)	(0.27)	(0.02)
Insurance Type	-24.21	-4.77***	0.74***	-0.09***	0.53*	-2.96***	0.68***	-0.60*	0.01
	(105.02)	(0.30)	(0.08)	(0.02)	(0.29)	(0.11)	(0.15)	(0.35)	(0.03)
Comorbidity	47.71	-2.13***	1.30***	-0.19***	-0.70***	-0.89***	-0.51***	-0.36**	-0.03*
	(40.94)	(0.16)	(0.05)	(0.01)	(0.08)	(0.05)	(0.05)	(0.15)	(0.02)
Constant	3,247***	38.50***	2.80***	1.64***	-3.30***	-0.15	4.75***	3.65***	-0.26***
	(64)	(0.24)	(0.06)	(0.02)	(0.20)	(0.09)	(0.12)	(0.26)	(0.02)
Observations	1,123,997	1,123,997	1,123,994	1,123,994	1,123,997	1,123,997	1,123,997	1,123,997	1,123,997
R-squared	0.11	0.20	0.25	0.19	0.12	0.06	0.08	0.03	0.01
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the estimation results of interacting a dummy for the sued department with the DID term, $\mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\}$, in Equation (3) and includes hospital-by-department fixed effects. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5%, and 10%, respectively.

Table B9: Heterogeneous Response to Medical Lawsuits: Spillover Effect to Non-similar Departments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total Cost	**1**{Surgery} (%)	Chinese Med. Ratio (%)	Lab Cost Ratio (%)	High Risk 1 (%)	Refer Ad. (%)	Refer to Others (%)	Readmission (%)	Death (%)
Response in Non-similar Dept	91.52	-1.02***	0.24***	0.12***	-1.41***	-0.40***	-0.07	0.11	0.03
*After*Lawsuit*	(66.99)	(0.22)	(0.05)	(0.01)	(0.18)	(0.10)	(0.09)	(0.17)	(0.02)
Response Difference btw Similar and Non-similar	-242.20	-6.43***	0.08	0.41***	-4.55***	-0.57**	-0.83***	2.44***	-0.08*
*After*Lawsuit*Similar Dept*	(191.10)	(0.66)	(0.11)	(0.03)	(0.47)	(0.28)	(0.14)	(0.51)	(0.04)
Lawsuit	-138.80***	-0.03	-0.06*	-0.43***	1.18***	0.29***	-0.39***	-0.35***	-0.02
	(48.09)	(0.16)	(0.03)	(0.01)	(0.14)	(0.07)	(0.07)	(0.13)	(0.02)
Same	1,200.00***	13.00***	-0.66***	-0.04***	5.76***	1.02***	-1.71***	-1.64***	0.01
	(56.49)	(0.22)	(0.04)	(0.01)	(0.16)	(0.09)	(0.06)	(0.16)	(0.02)
Patient Age	1,359.00***	-3.64***	1.43***	-0.16***	4.34***	1.29***	-0.36***	2.03***	0.14***
	(19.48)	(0.07)	(0.02)	(0.00)	(0.06)	(0.03)	(0.04)	(0.07)	(0.01)
Male	1,022.00***	-4.74***	-0.57***	0.08***	2.53***	0.87***	0.68***	0.99***	0.09***
	(39.79)	(0.12)	(0.04)	(0.01)	(0.12)	(0.05)	(0.06)	(0.14)	(0.01)
Subsidy	55.17	-2.13***	0.61***	-0.20***	0.97***	1.57***	-0.14*	3.38***	0.04*
	(61.39)	(0.18)	(0.06)	(0.01)	(0.18)	(0.11)	(0.08)	(0.27)	(0.02)
Insurance Type	-27.57	-4.84***	0.74***	-0.09***	0.57**	-2.95***	0.68***	-0.60*	0.01
	(105.03)	(0.30)	(0.08)	(0.02)	(0.29)	(0.11)	(0.15)	(0.35)	(0.03)
Comorbidity	49.66	-2.14***	1.30***	-0.19***	-0.60***	-0.88***	-0.52***	-0.37**	-0.03*
	(40.95)	(0.16)	(0.05)	(0.01)	(0.08)	(0.05)	(0.05)	(0.15)	(0.02)
Constant	3,236***	38.50***	2.79***	1.64***	-3.63***	-0.18*	4.77***	3.69***	-0.26***
	(63.75)	(0.24)	(0.06)	(0.02)	(0.20)	(0.09)	(0.12)	(0.26)	(0.02)
Observations	1,123,997	1,123,997	1,123,994	1,123,994	1,123,997	1,123,997	1,123,997	1,123,997	1,123,997
R-squared	0.11	0.20	0.25	0.19	0.13	0.06	0.08	0.03	0.01
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the estimation results of interacting a dummy for the similar departments as the sued department with the DID term, $\mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\}$, in Equation (3) and include hospital-by-department fixed effects. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively.

Table B10: Response to Patient In-hospital Deaths

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total Cost	**1**{Surgery} (%)	Chinese Med. Ratio (%)	Lab Cost Ratio (%)	High Risk 1 (%)	Refer Ad. (%)	Refer to Others (%)	Readmission (%)	Death (%)
After*Lawsuit	-79.17	-1.64***	0.41***	0.18***	-1.92***	-0.49***	0.12	0.38**	0.04**
	(71.62)	(0.24)	(0.05)	(0.01)	(0.19)	(0.11)	(0.09)	(0.18)	(0.02)
Lawsuit	-90.20*	0.34**	-0.07**	-0.43***	1.34***	0.32***	-0.43***	-0.37***	0.04**
	(48.02)	(0.16)	(0.03)	(0.01)	(0.14)	(0.07)	(0.07)	(0.13)	(0.02)
AfterDeath	157.93***	-0.61***	0.08**	0.02	-0.36***	-0.14	0.28***	0.40***	0.87***
	(54.01)	(0.17)	(0.04)	(0.01)	(0.14)	(0.08)	(0.09)	(0.13)	(0.03)
AfterDeath*After*Lawsuit	396.82***	0.53*	-0.49***	-0.09***	0.59**	0.16	-0.76***	-0.38	-0.23***
	(102.88)	(0.32)	(0.07)	(0.02)	(0.27)	(0.15)	(0.15)	(0.24)	(0.05)
Patient Age	1,361.00***	-3.61***	1.43***	-0.16***	4.35***	1.29***	-0.36***	2.02***	0.14***
	(19.50)	(0.07)	(0.02)	(0.00)	(0.06)	(0.03)	(0.04)	(0.07)	(0.01)
Male	1,008.00***	-4.89***	-0.56***	0.08***	2.46***	0.86***	0.70***	1.01***	0.09***
	(39.77)	(0.12)	(0.04)	(0.01)	(0.12)	(0.05)	(0.06)	(0.14)	(0.01)
Subsidy	47.45	-2.19***	0.62***	-0.20***	0.94***	1.57***	-0.13*	3.38***	0.04*
	(61.43)	(0.18)	(0.06)	(0.01)	(0.18)	(0.11)	(0.08)	(0.27)	(0.02)
Insurance Type	-35.34	-4.92***	0.75***	-0.09***	0.53*	-2.96***	0.70***	-0.59*	0.02
	(105.03)	(0.30)	(0.08)	(0.02)	(0.29)	(0.11)	(0.15)	(0.35)	(0.03)
Comorbidity	34.26	-2.37***	1.32***	-0.19***	-0.70***	-0.90***	-0.48***	-0.33**	-0.00
	(40.91)	(0.16)	(0.05)	(0.01)	(0.08)	(0.05)	(0.05)	(0.15)	(0.02)
Constant	3,258***	39.30***	2.73***	1.64***	-3.24***	-0.09	4.61***	3.50***	-0.49***
	(65.02)	(0.24)	(0.06)	(0.02)	(0.20)	(0.10)	(0.12)	(0.26)	(0.03)
Observations	1,123,997	1,123,997	1,123,994	1,123,994	1,123,997	1,123,997	1,123,997	1,123,997	1,123,997
R-squared	0.11	0.20	0.25	0.19	0.12	0.06	0.08	0.03	0.01
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the estimation results of augmenting Equation (3) by adding the death shock and interacting it with the litigation shock. Particularly, we add a dummy indicating whether patient i's visit is within 30 days after an in-hospital death at i's department to measure the effect of in-hospital death, and we interact this term with $\mathbb{1}\{h \in \mathcal{H}_c^{\text{sued}}\} \cdot \mathbb{1}\{t > T_c^{\text{review}}\}$, the shock for litigation. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively.

Table B11: Heterogeneous Response to Medical Lawsuits: Win vs. Lose

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total Cost	**1**{Surgery} (%)	Chinese Med. Ratio (%)	Lab Cost Ratio (%)	High Risk 1 (%)	Refer Ad. (%)	Refer to Others (%)	Readmission (%)	Death (%)
Panel A: Hospital Winning Cases									
After*Lawsuit	285.10***	-1.67***	0.20***	0.14***	-2.15***	-0.47***	-0.46***	0.26	0.01
	(89.69)	(0.28)	(0.06)	(0.02)	(0.24)	(0.14)	(0.12)	(0.21)	(0.03)
Lawsuit	-194.02***	0.65***	-0.14***	-0.55***	2.57***	0.35***	-0.55***	-0.69***	-0.04
	(69.33)	(0.22)	(0.05)	(0.01)	(0.19)	(0.11)	(0.10)	(0.17)	(0.02)
Patient Age	1,373.00***	-3.75***	1.41***	-0.15***	4.31***	1.32***	-0.41***	2.07***	0.15***
	(21.58)	(0.07)	(0.02)	(0.01)	(0.07)	(0.04)	(0.04)	(0.08)	(0.01)
Male	1,011.00***	-4.87***	-0.59***	0.07***	2.39***	0.84***	0.76***	1.03***	0.10***
	(43.47)	(0.14)	(0.04)	(0.01)	(0.13)	(0.06)	(0.07)	(0.16)	(0.01)
Subsidy	22.01	-2.10***	0.65***	-0.21***	0.91***	1.62***	-0.19*	3.35***	0.05*
	(69.48)	(0.21)	(0.06)	(0.01)	(0.19)	(0.13)	(0.10)	(0.31)	(0.03)
Insurance Type	-58.69	-4.93***	0.74***	-0.07***	0.22	-2.84***	0.78***	-0.58	0.02
	(114.91)	(0.34)	(0.09)	(0.02)	(0.31)	(0.13)	(0.18)	(0.41)	(0.03)
Comorbidity	-111.10**	-1.93***	1.43***	-0.24***	-2.69***	-1.08***	-0.71***	-0.06	-0.04*
	(51.53)	(0.20)	(0.06)	(0.01)	(0.09)	(0.07)	(0.06)	(0.19)	(0.02)
Constant	3,317.00***	39.20***	2.68***	1.69***	3.76***	-0.27***	-0.17	5.04***	-3.06***
	(70.20)	(0.27)	(0.06)	(0.02)	(0.29)	(0.02)	(0.11)	(0.14)	(0.21)
R-squared	0.11	0.19	0.25	0.19	0.12	0.06	0.08	0.03	0.01
Observations	476,511	476,511	476,511	476,511	476,511	476,511	476,511	476,511	476,511
Panel B: Hospital Losing Cases									
After*Lawsuit	-311.29***	-1.19***	0.30***	0.16***	-1.09***	-0.38**	0.17	0.34	0.05
	(113.11)	(0.39)	(0.08)	(0.02)	(0.31)	(0.18)	(0.19)	(0.30)	(0.04)
Lawsuit	-23.41	-0.42	0.27***	-0.44***	0.89***	0.32**	-0.34**	-0.37	0.01
	(83.79)	(0.29)	(0.06)	(0.01)	(0.24)	(0.13)	(0.15)	(0.24)	(0.03)
Patient Age	1,346.00***	-3.42***	1.45***	-0.18***	4.40***	1.25***	-0.30***	1.95***	0.13***
	(21.49)	(0.07)	(0.02)	(0.01)	(0.07)	(0.03)	(0.04)	(0.07)	(0.01)
Male	1,001.00***	-4.91***	-0.53***	0.09***	2.55***	0.89***	0.62***	0.99***	0.09***
	(44.68)	(0.14)	(0.04)	(0.01)	(0.13)	(0.06)	(0.07)	(0.15)	(0.01)
Subsidy	105.59	-2.32***	0.56***	-0.18***	0.94***	1.50***	-0.02	3.47***	0.03
	(68.03)	(0.20)	(0.07)	(0.01)	(0.20)	(0.13)	(0.09)	(0.28)	(0.03)
Insurance Type	0.36	-4.92***	0.76***	-0.12***	1.05***	-3.12***	0.59***	-0.61*	0.01
	(117.22)	(0.34)	(0.09)	(0.02)	(0.32)	(0.13)	(0.17)	(0.34)	(0.03)
Comorbidity	201.50***	-2.89***	1.21***	-0.13***	1.95***	-0.70***	-0.14**	-0.67***	-0.02
	(46.72)	(0.18)	(0.05)	(0.01)	(0.11)	(0.06)	(0.07)	(0.16)	(0.02)
Constant	3,279.00***	39.20***	2.82***	1.60***	3.48***	-0.25***	-0.07	4.18***	-3.94***
	(70.90)	(0.27)	(0.07)	(0.02)	(0.26)	(0.03)	(0.11)	(0.13)	(0.22)
R-squared	0.11	0.20	0.26	0.18	0.13	0.06	0.07	0.03	0.01
Observations	647,486	647,486	647,485	647,485	647,486	647,486	647,486	647,486	647,486
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3) with two subsamples. The upper panel displays the results by using cases where hospitals win. The lower panel displays the results by using cases where hospitals lose. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively.

Table B12: Heterogeneous Response to Medical Lawsuits: By Lawsuit Reason

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total Cost	**1**{Surgery} (%)	Chinese Med. Ratio (%)	Lab Cost Ratio (%)	High Risk 1 (%)	Refer Ad. (%)	Refer to Others (%)	Readmission (%)	Death (%)
Panel A: Alleged Unsuccessful Surgery									
After*Lawsuit	55.32	-1.08***	0.18***	0.23***	-2.50***	-0.33***	-0.03	0.15	0.04
	(86.66)	(0.28)	(0.06)	(0.02)	(0.24)	(0.13)	(0.10)	(0.22)	(0.03)
Lawsuit	-14.69	0.44*	-0.16***	-0.40***	2.78***	-0.09	-0.54***	-0.28	-0.01
	(70.94)	(0.24)	(0.05)	(0.01)	(0.21)	(0.10)	(0.08)	(0.20)	(0.02)
Patient Age	1,338.00***	-3.76***	1.37***	-0.14***	4.28***	1.09***	-0.36***	2.12***	0.15***
	(20.75)	(0.07)	(0.02)	(0.00)	(0.07)	(0.03)	(0.04)	(0.07)	(0.01)
Male	1,034.00***	-4.75***	-0.58***	0.05***	2.59***	0.76***	0.71***	1.03***	0.10***
	(43.41)	(0.13)	(0.04)	(0.01)	(0.13)	(0.05)	(0.07)	(0.14)	(0.01)
Subsidy	-50.50	-1.92***	0.71***	-0.21***	1.12***	1.69***	0.07	3.14***	0.04**
	(65.91)	(0.18)	(0.06)	(0.01)	(0.18)	(0.11)	(0.09)	(0.26)	(0.02)
Insurance Type	50.17	-4.10***	0.65***	-0.08***	1.07***	-2.31***	0.77***	-0.68**	0.03
	(113.10)	(0.31)	(0.08)	(0.02)	(0.30)	(0.11)	(0.17)	(0.34)	(0.03)
Comorbidity	160.99***	-2.32***	1.40***	-0.26***	0.24**	-0.82***	-0.50***	-0.90***	-0.04**
	(45.08)	(0.17)	(0.05)	(0.01)	(0.10)	(0.06)	(0.06)	(0.15)	(0.02)
Constant	3,386.00***	39.00***	2.75***	1.59***	3.34***	-0.31***	-0.12	4.80***	-3.56***
	(70.32)	(0.25)	(0.06)	(0.02)	(0.26)	(0.02)	(0.09)	(0.13)	(0.21)
Observations	674,511	674,511	674,510	674,510	674,511	674,511	674,511	674,511	674,511
R-squared	0.11	0.19	0.25	0.21	0.12	0.06	0.08	0.03	0.01
Panel B: Other Alleged Errors: Inadequate Treatment or Diagnosis									
After*Lawsuit	67.87	-2.29***	0.37***	0.14**	-0.65**	-0.47**	-0.23	0.53*	-0.01
	(111.03)	(0.37)	(0.07)	(0.02)	(0.28)	(0.20)	(0.19)	(0.28)	(0.04)
Lawsuit	-308.21***	0.39	-0.06	-0.56***	-0.61***	0.82***	-0.61***	-0.82***	-0.05
	(82.50)	(0.28)	(0.06)	(0.01)	(0.23)	(0.15)	(0.15)	(0.23)	(0.03)
Patient Age	1,396.00***	-3.39***	1.51***	-0.19***	4.47***	1.60***	-0.38***	1.85***	0.12***
	(23.92)	(0.08)	(0.02)	(0.01)	(0.07)	(0.04)	(0.04)	(0.09)	(0.01)
Male	966.96***	-5.09***	-0.52***	0.11***	2.28***	1.02***	0.69***	0.97***	0.08***
	(47.54)	(0.16)	(0.04)	(0.01)	(0.14)	(0.07)	(0.07)	(0.18)	(0.02)
Subsidy	203.94***	-2.60***	0.41***	-0.18***	0.66***	1.38***	-0.44***	3.73***	0.04
	(73.24)	(0.23)	(0.07)	(0.01)	(0.22)	(0.14)	(0.10)	(0.35)	(0.03)
Insurance Type	-199.88	-6.21***	0.87***	-0.09***	-0.48	-3.94***	0.60***	-0.35	-0.00
	(126.02)	(0.40)	(0.11)	(0.02)	(0.36)	(0.17)	(0.19)	(0.45)	(0.04)
Comorbidity	-213.40***	-2.36***	1.12***	-0.10***	-2.38***	-0.99***	-0.17***	0.63***	-0.04
	(51.58)	(0.22)	(0.07)	(0.01)	(0.09)	(0.06)	(0.06)	(0.20)	(0.03)
Constant	3,208.00***	39.20***	2.80***	1.72***	4.08***	-0.19***	-0.25**	4.42***	-3.04***
	(74.30)	(0.30)	(0.07)	(0.02)	(0.30)	(0.03)	(0.13)	(0.13)	(0.23)
Observations	449,486	449,486	449,484	449,484	449,486	449,486	449,486	449,486	449,486
R-squared	0.12	0.20	0.27	0.16	0.12	0.07	0.07	0.03	0.01
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case*Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the results of estimating Equation (3) with two subsamples. The upper panel displays the results by using cases where the alleged error is an unsuccessful surgery. The lower panel displays the results by using cases where the alleged error is inadequate treatment or missed diagnosis. Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively.

Table B13: Response to Violent Attack

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total Cost	**1**{Surgery} (%)	Chinese Med. Ratio (%)	Lab Cost Ratio (%)	High Risk 1 (%)	Refer Ad. (%)	Refer to Others (%)	Readmission (%)	Death (%)
After Violence	696.10*	-17.90***	3.11***	0.39***	-24.20***	-2.11***	-11.90***	-4.54***	-0.18
	(388.71)	(0.65)	(0.22)	(0.08)	(0.36)	(0.59)	(0.39)	(0.95)	(0.15)
Male	930.80***	-5.00***	-0.51***	0.02	1.73***	0.81***	0.91***	1.21***	0.09***
	(83.99)	(0.28)	(0.06)	(0.02)	(0.22)	(0.14)	(0.16)	(0.30)	(0.03)
Subsidy	973.86***	-3.44***	0.88***	-0.20***	1.90***	3.24***	0.01	4.20***	0.03
	(117.63)	(0.36)	(0.09)	(0.03)	(0.29)	(0.25)	(0.19)	(0.45)	(0.04)
Insurance Type	455.40**	-6.55***	0.73***	-0.07	1.91***	-1.81***	1.39***	1.40*	0.02
	(232.36)	(0.70)	(0.14)	(0.05)	(0.56)	(0.29)	(0.43)	(0.72)	(0.06)
Comorbidity	690.20***	-1.45***	1.43***	-0.28***	1.87***	-0.37**	-0.48***	-0.44	-0.04
	(128.59)	(0.43)	(0.09)	(0.03)	(0.23)	(0.17)	(0.12)	(0.39)	(0.03)
Constant	6,815.00***	28.70***	4.87***	1.91***	6.54***	3.53***	4.61***	11.10***	0.16***
	(85.71)	(0.29)	(0.06)	(0.02)	(0.20)	(0.13)	(0.14)	(0.29)	(0.03)
Observations	83,070	83,070	83,070	83,070	83,070	83,070	83,070	83,070	83,070
R-squared	0.12	0.21	0.27	0.24	0.13	0.05	0.19	0.03	0.01
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Patient Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the estimation results by estimating Equation (7). Other patient characteristics include patient profession, location, and diagnosis code indicators. Standard errors are clustered at the hospital level. ***, **, and * represent significance at 1%, 5% and 10%, respectively.