The doctor–patient relationship, defensive medicine and overprescription in Chinese public hospitals: Evidence from a cross-sectional survey in Shenzhen city

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ABSTRACT
Defensive medicine describes physicians’ behavioral response to threats from medical malpractice litigation. Previous studies have found widespread practice of defensive medicine that is responsible for the global escalation of health care costs. Defying the traditional explanations, this study, with a case of a Chinese city, reveals that in a country where medical malpractice lawsuits are rare, physicians’ self-perceived threats from patients may constitute a major reason for defensive practices. Defensive behaviors in the Chinese context mainly take the form of overprescribing diagnostic tests, procedures and drugs. The existing literature tends to explain this in terms of Chinese doctors’ desire to supplement their low incomes. Behind this is a series of misaligned incentives deeply embedded in the Chinese health system. Using a cross-sectional survey of physicians, this study shows that overprescription in Chinese hospitals is driven not only by hard economic incentives, but also by doctors’ motive of avoiding disputes with patients. The survey was carried out in Shenzhen City, in December 2013. A sample containing 504 licensed physicians was drawn by random sampling. Descriptive analyses identified significant dissatisfaction with income and workload as well as severe tensions between doctors and patients. Drawing from the literature on defensive medicine, multivariate analysis revealed that physicians’ previous experience of medical disputes is significantly associated with defensive behaviors, particularly overprescription. Low income continued to be a critical predictor, reinforcing the target income hypothesis and suggesting the resilience of perverse economic incentives. This study sheds fresh light on China’s recent health policy reforms by highlighting the critical impact of the doctor–patient relationship. The effort to contain health care costs must progress on two fronts, mitigating the tensions between doctors and patients while still reforming the remuneration scheme cautiously to enable physicians to respond to right incentives.

1. Introduction
Studies on provider behaviors occupy the central stage of health economics and policy research. A particular strand of the literature focuses on medical malpractice and its effects on provider behaviors. Defined as medical practice based on fear of legal liability rather than on patients’ best interests, the concept of defensive medicine describes physicians’ distorted behaviors in response to potential threats stemming from malpractice litigation (Kessler et al., 2006). In the global escalation of health care costs, defensive medicine has been increasingly recognized as a perverse engine as it motivates physicians to provide lots of unnecessary services. Explanations for physicians’ defensive behaviors, however, vary. Many studies especially those based on the US context attribute defensive medicine to medical malpractice litigation systems whereas others have sought to explain it from physicians’ internal emotional mechanisms rather than from external modifier of behaviors (Cunningham and Wilson, 2010).

This article joins the debate with a fresh case from China, where empirical studies analyzing defensive medicine are scant. Based on the rich body of literature on the country’s health system, this article notes that defensive behaviors in the Chinese context mainly take the form of overprescribing diagnostic tests, procedures and drugs, a problem plaguing the country’s health system for long. Defying the traditional explanations for defensive medicine, this
studies tend to propose tort reforms to reduce physicians' exposure to this risk, but as Veldhuis (1994) rightly points out, the pressure from lawsuits may not be the key cause of defensive medicine in other health systems where such litigation is rare. Using the case of the Netherlands, Veldhuis illustrates that it is actually the desire to prevent problems in the doctor—patient relationship that causes defensive behaviors. He stresses that this nonlitigation-related defensive medicine is rooted in the doctor—patient relationship in the Dutch context. Cunningham and Dovey (2006), too, observed that in New Zealand's litigation-free medical system, complaints from patients have led to a variety of doctors' behavioral changes such as more investigations, referrals and documentation, all of which aim to forestall potential complaints. Cunningham and Dovey's study reinforces that malpractice litigation does not constitute the sole reason behind defensive medicine; this doctor-patient perspective has provided a useful alternative in explaining the pervasive overprescription in the Chinese health care system.

3. Research question

China is in the midst of carrying out an ambitious program of national health care reforms. Launched in 2009, this initiative is intended to overhaul a system which has deteriorated significantly in the past three decades, and build a comprehensive and universal replacement by 2020 (Chen, 2009). An extensive literature documents the sorry condition of China's health care since the 1980s. Double-digit inflation in health expenditure and reduced access to care are the main symptoms of decline (Blumenthal and Hsiao, 2005; Yip and Hsiao, 2008). These problems are deeply rooted in a series of misaligned incentives, particularly on the supply side (Hu et al., 2008; Yip et al., 2010). At the root of the rapid inflation in costs lies a plethora of distorted physician behaviors driven by perverse incentives. In particular, the overprescription of pharmaceuticals, high-tech clinical tests and expensive procedures are very common in Chinese hospitals (Hsiao, 2008; Eggleston et al., 2008).

Containing such inflation is one of the key objectives of the ongoing health care reforms. Any cost containment measure targeted at the supply side, however, must be based on thorough understanding of a single fundamental question: why do Chinese physicians overprescribe? Most studies explain this by reference to economic incentives; that is, poorly paid physicians are motivated to provide unnecessary care in order to supplement their low incomes. The author's motivation to pursue this study comes from having conducted a series of in-depth interviews with Chinese frontline doctors from 2010 to 2012. In an attempt to probe the underlying reasons for physicians' cost-inflationary behaviors, he invited 22 doctors from four provinces, Zhejiang, Fujian, Shanxi and Guangdong, to participate in interviews on an individual basis. What astonished the author was that while all interviewees confessed to overprescribing, they exclusively attributed this to the rising tension within the doctor—patient relationships rather than to monetary returns. A typical explanation ran as follows:

The reputation of doctors has declined rapidly over the years. Patients and their family members are often very suspicious of our diagnoses and treatments. The number of medical malpractice lawsuits has risen. The consequences of getting swamped into medical disputes or even being sued could be rather severe. Our reputation would be ruined, we may be penalized by the hospital, and there is even a possibility of imprisonment! To reduce the risks of misdiagnosis and to retain essential evidence for use in a lawsuit, sometimes we do have to prescribe more [tests, procedures and/or drugs]. Not to mention that many patients may charge us for negligence if we don't do so."
This line of answer clearly reflects the defensive motive of medical practice. However, when it comes to China, there is a dearth of empirical studies examining the practice of defensive medicine as well as its implications for health policy. Most studies explain the provision of unnecessary care predominantly by reference to physicians’ pursuit of supplementary income (Chen, 2007; Fan, 2007; Tam, 2011). Among the very few studies on this topic to be set in China, Chen’s (2007) qualitative analysis argues that “economically motivated corruption” rather than defensive motive of medicine is the real reason behind the overprescription, because malpractice litigation has yet become a major threat to doctors in China, in light of the low frequency.

However, physicians’ own explanations, as elicited from the author’s in-depth interviews, are not completely an excuse, given the well-known and escalating tension between doctors and patients, including some high-profile incidents in recent years such as violence against doctors and even murders. It is thus a plausible hypothesis that Chinese doctors may be motivated to engage in defensive medicine to manage the threat of conflicts with patients or even malpractice litigation. How do Chinese physicians view the current doctor-patient relationship? What is the impact of these rising tensions on their behaviors? Do Chinese physicians practice defensively because of their fear of disputes and malpractice suits? What are the implications for the country’s ongoing national health care reform? This article attempts to answer these questions by analyzing primary data collected from a survey of physicians in a Chinese city.

4. Background

Chinese health care after the foundation of the People’s Republic was structured to resemble the Soviet system. Private practices were quickly eradicated as capitalist. All hospitals were virtually public. Governments funded capital investment while hospitals’ operational costs were recovered by heavy subsidies (Gu, 2001). Patients’ fees were set at nominal levels to ensure accessibility. Health workers in hospitals were state employees entitled to quasi-civil service status, receiving fixed salaries (Ma et al., 2008). A large number of them were the so-called barefoot doctors providing basic care to the vast rural population. Barefoot doctors underwent basic medical training and were paid by communist communes (Bloom et al., 2001). Revered as the “angels in white,” the medical profession enjoyed wide respect.

China’s market transition since 1978, while created the country’s enviable economic miracle, also dismantled its “mini welfare state.” Because of the decline in government revenues, starting from 1980, central government had to substantially limit its funding to the health sector, which had accounted for 50–60% of hospitals’ income in the planned economy (Hsiao, 1995). Unable to finance public hospitals, the government allowed them to generate income from patients to ensure their financial survival (Liu and Hsiao, 1995). This has been further encouraged by an ill-designed fee schedule and overreliance on fees-for-service in paying providers. This situation has created strong incentives for hospitals to shift from cost-effective care to the overutilization of high-tech diagnostic tests and expensive pharmaceuticals, hence inflating costs powerfully (Liu et al., 2000; Hu et al., 2008).

Thus motivated to generate profit, most Chinese hospitals have tied physicians’ incomes to their revenue generation performance, adding a further perverse incentive in favor of profit making while ignoring patient care (Pei et al., 2000; Liu and Mills, 1999, 2003). The abuse of profitable tests and the overprescription of drugs, especially antibiotics, are now ubiquitous in Chinese hospitals (Dong et al., 2008; Reynolds and McKee, 2009). As illustrated in Fig. 1, the costs of pharmaceuticals and clinical tests have risen sharply over the past decade. Receiving half their income from selling drugs, Chinese hospitals are run as profit-seeking entities (Blumenthal and Hsiao, 2005; Yip and Hsiao, 2008). From 1998 to 1999, a study investigating township health centers and village clinics in two counties in western China found that less than 2% of drug prescriptions could be considered “rational” (Zhang et al., 2003). More than one third of Chinese pharmaceutical spending goes to unnecessarily prescribed drugs (Hsiao, 2008). This echoes Zhong’s (2001) estimate that 20–30% of China’s total health expenditure, or about 1% of the country’s GDP, is spent on unnecessary care.

While vast overprescription is a complex function of factors from both the supply-side and the demand-side, Currie et al.’s (2011) recent audit study has managed to rule out demand-side effects and suggests that it is largely a supply-side phenomenon. The link between overprescription and supply-side incentives is rooted in three key factors, apart from the notorious revenue target assigned to individual physicians. Firstly, Chinese physicians take drug commissions from pharmaceutical companies, usually on a per-prescription basis. Such payments constitute a substantive proportion of their real take-home pay (Pei et al., 2000). Secondly, to encourage physicians to order more diagnostic tests, especially those involving imaging, and hence increase profit, many hospitals offer kickbacks to doctors (Bloom et al., 2001; Chen, 2007). While this has generated enormous revenues for hospitals, it has been widely condemned as unethical. Many hospitals have now had to abolish the practice after administrative intervention. However, as

![Fig. 1. Average drug and clinical test expenditures in China’s comprehensive hospitals, 2002–2011. Source: China Health Statistical Yearbook (various years), Beijing: China Union Medical University Press.](image-url)
He and Qian’s (2013) empirical study suggests, Chinese frontline physicians are still motivated to prescribe profitable tests because they are fully aware that hospitals’ revenues are the ultimate source of their bonuses, which account for 50–60% of their payroll income. Thus, even though there is no longer a direct monetary return, there remains a strong incentive to overprescribe. In the meantime, however, any measures that might negatively affect physicians’ tangible economic interests, particularly their bonus payments, are likely to be resisted in a variety of opportunistic ways (He and Qian, 2013).

These perverse incentives have powerfully distorted physicians’ actions and driven them towards a plethora of demand-inducing behaviors. Medical ethics have largely evaporated (Hsiao, 2008). Mistrust towards the medical profession has become widespread in society. This has been further aggravated by the disclosure of numerous medical accidents and scandals in the past years. As Shen (2013) argues, Chinese patients have become accustomed to most sorts of deviant behaviors of doctors, including overprescription, over the past decades, and have to largely accept them as social reality. With the decline of public confidence on the medical profession’s ethical standards, suspicion prevails. Patients are certainly aware that doctors may overprescribe, but their disadvantaged position does not leave them much bargaining power as individuals. A survey by the China Youth Daily (2013) reports that nearly 70% of patients are suspicious of doctors’ diagnoses and treatments. A newly released nationwide survey also indicates that merely 26% of physicians feel trusted by their patients, and 70.9% would choose another occupation given the opportunity. A further 76.7% do not wish their children to attend medical schools (Life Daily, 2014). All these facts reflect a rather antagonistic environment within which the medical profession operates. Worse still, the doctor–patient relationship in China in the past decade has rapidly escalated from mere mistrust to an upsurge in conflicts leading to outright violence, such as murder (New York Times, 2013).

In parallel to patients’ suspicion of physicians, the number of medical disputes in China has also skyrocketed. According to the Chinese Society for Hospital Management, the total number of such disputes has been increasing by 22.9% per year since 2002. On average, each Chinese hospital deals with 27 cases of violence targeted at doctors per year (Xinhua Daily Telegraph, 2013). A profession called the “medical harassers” (yi nao) has sprung up to facilitate patients’ blackmailing their doctors for compensation, as most hospitals would rather have disputes settled privately instead of being sued. In a recent survey of doctors in Liaoning Province, 47.2% respondents reported serious dissatisfaction with their relationships with patients, which in turn fueled high levels of occupational stress (Wu et al., 2013).

In a climate of such widespread suspicion, many medical disputes escalate to lawsuits. Under China’s tort law system, physicians who are sued have a legal obligation to produce evidence to support their plea of innocence (Liebman, 2013). The Ordinances on Medical Negligence and Malpractice issued by the State Council in 2002 provide that:

‘Medical negligence and malpractice refer to an incident in which the medical establishment and its professionals violated a health care management statute, an administrative decree, departmental rules and regulations, or diagnostic, therapeutic, and nursing norms in a medical intervention and have negligently caused physical injury to a patient.

In 2001, China’s Supreme Court announced the Regulations on Evidence in Civil Lawsuits, which stipulate that in civil lawsuits originating from medical activities that may have violated the patient’s rights, the relevant health care institutions are obliged to provide evidence to show the absence of a causal connection between medical treatment and any harmful outcomes, and to prove that no medical negligence or malpractice was involved. The development of the legal environment over the past decade has important implications for medical practice in China. It may therefore be proposed that physicians will be motivated to over-prescribe unnecessary procedures, especially those of a diagnostic nature, both to avoid misdiagnosis, and to retain essential evidence.

The theoretical framework of this study is first built on the target income hypothesis in health economics. Commonly used in explaining provider-induced demand, the hypothesis suggests that a physician is motivated to maintain a certain level of income and if his/her actual income falls below this target, the physician will then behave as an income maximizer until the target income is met (Newhouse, 1970; Rice, 1983). Taking off from this hypothesis, past studies have revealed that low income and the strong desire to earn higher income have provided Chinese physicians with very powerful incentives for overprescribing drugs and tests. This is further fueled by various bonus schemes and fee-for-service payment (Liu and Mills, 2007; Yang, 2009). Secondly, drawing from the literature of defensive medicine, it is hypothesized that a Chinese physician’s past experience of medical disputes with patients encourage his/her defensive behaviors for self-protection purposes. This hypothesis is informed by both theoretical prediction and the author’s in-depth interviews as discussed above.

5. Methodology

While the defensive practice of medicine is clinically unnecessary and inflicts cost, there are major methodological challenges involved in measuring it. Firstly, medical decision making is a complex function of various factors. It is difficult in practice to single out the effect of the threat of malpractice suits. Secondly, since not all practices motivated by considerations of liability will result in poor-quality medical care, it is difficult to draw the line between good medicine stops and defensive medicine begins (Hershey, 1972). Hence, there are widespread debates on how defensive medicine can be measured effectively (Klingman et al., 1996).

This study used a questionnaire survey to probe physicians’ perceptions and behaviors. Ethical approval was obtained from the Committee on Research and Development of the Hong Kong Institute of Education. The 25-item instrument measured demographic and professional variables as well as capturing physicians’ views on the doctor–patient relationship and their personal experience of disputes. The key question which set out to measure the defensive practice of medicine was: “In view of the tensions between doctors and patients, do you prescribe diagnostic tests or procedures that are clinically unnecessary, to avoid possible troubles (such as disputes and lawsuits)?” Since the author’s interviewees had all previously reported this phenomenon, the phrasing of this question was considered likely to be acceptable to the respondents and to involve no or little sensitivity. The answer options offered were “often”, “sometimes”, and “never.” Although there might still be bias introduced by respondents’ reluctance to reveal their true behaviors, it is easy to understand that if there are motives for misreporting, physicians will naturally tend to under- rather than over-report their deviant behaviors. Therefore, this study can still provide a minimum estimate of prevalence.

The survey was conducted in Shenzhen City, Guangdong Province. As one of China’s five Special Economic Zones, it has been the pioneer in the country’s rapid economic growth since 1980s. In 2013, Shenzhen’s GDP per capita reached US$22,000, making it one of the richest in all Chinese cities. Yet, the city’s economic prosperity is not fully reflected in its health system, especially in...
specialized tertiary care. Many residents prefer to seek care in Guangzhou, the provincial capital and medical hub, when it comes to catastrophic diseases.

The survey was undertaken in December 2013 and targeted licensed medical practitioners who were qualified to write prescriptions. The author seized the opportunity when the municipal health bureau was hosting physician training programs (on ethical conduct) to distribute the questionnaires. Participants were all from public hospitals and had no prior information about the survey. Since the training programs which presented the opportunity to access respondents were available to all physicians working in public hospitals, and the author randomly selected a few sessions from which the sample was drawn, it can be seen as random sampling which has minimized selection bias and secured representativeness to a large extent. The author used a central setting to distribute the questionnaires to safeguard anonymity and confidentiality. The respondents were reassured that the survey was for research purpose only. The author distributed 600 questionnaires and collected 504 in the end, giving a response rate of 84%. The sample represented 2.1% of all licensed physicians (23,942 as of 2013) in the city. Table 1 presents the profile of respondents.

As well as collecting demographic and professional information, the survey focused on measuring four dimensions: 1) income, workload and morale; 2) general perceptions of the current doctor–patient relationship; 3) personal experience of disputes with patients and their views on the causes of such incidents; and 4) behavioral responses to these doctor-patient tensions. The description of key variables is set out in Table 2. Uni-, bi-, and multivariate methods were used to analyze the data in STATA 12.0.

### 6. Results

The survey firstly measured physicians' income and workload. Respondents were asked about their monthly payroll income including basic salary and bonus, as well as their satisfaction with this level of income. Extra income from sources such as red packets (hong bao; bribes from patients), kickbacks, and other under-the-table payments was not included. On average, 80.5% of physicians in the sample were paid between 4001 yuan and 8000 yuan per month (equivalent to US$650 to US$1300). Those paid more than 8001 yuan and less than 4000 yuan accounted for 15.1% and 4.4% respectively. A striking finding is the overwhelming dissatisfaction expressed by doctors, with 84.1% expressing discontent with their current level of compensation. The author used number of outpatient consultations per day as a proxy of physicians' workload. The respondents were also invited to rate their perceived workload against a five-point scale, from “very heavy” to “very light.” About 20% respondents reported feeling overloaded, attending more than 50 outpatient consultations per day. Such a workload was deemed heavy or too heavy by 63.1% of respondents. Heavy workload and poor compensation were associated with low morale. Just 11.1% of respondents reported high morale at work, with 58.7% describing this as low.

Three questions were asked to gauge physicians' views on their relationships with patients; 1) what is the degree of respect you receive from your patients?; 2) what is the degree of trust you feel from your patients?; and 3) how do you perceive the current doctor–patient relationship? Ordinal categories were provided. A total of 53.5% (N = 270) and 15.2% (N = 77) of respondents, respectively, reported “low” and “very low” levels of respect from patients. Close to half (50.8%) indicated that patients' level of trust was “fair.” Job title was insignificant in explaining these, with more senior physicians not necessarily reporting more trust and respect from patients. Remarkably, 65.9% (N = 332) and 23.8% (N = 120) of the respondents described the doctor–patient relationship as “very tense” and “tense,” respectively, accounting for a large majority (89.7%) of the sample.

### Table 1

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N = 504</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>252 (50.0%)</td>
</tr>
<tr>
<td>Female</td>
<td>252 (50.0%)</td>
</tr>
<tr>
<td>Hospital level</td>
<td></td>
</tr>
<tr>
<td>Class III</td>
<td>122 (24.2%)</td>
</tr>
<tr>
<td>Class II and class I</td>
<td>382 (75.8%)</td>
</tr>
<tr>
<td>Technical title</td>
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<tr>
<td>Junior</td>
<td>158 (31.3%)</td>
</tr>
<tr>
<td>Middle</td>
<td>230 (45.6%)</td>
</tr>
<tr>
<td>Senior</td>
<td>116 (23.1%)</td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
</tr>
<tr>
<td>Internal medicine</td>
<td>146 (29.0%)</td>
</tr>
<tr>
<td>Surgery</td>
<td>225 (44.6%)</td>
</tr>
<tr>
<td>Obstetrics &amp; gynecology</td>
<td>68 (13.4%)</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>38 (7.5%)</td>
</tr>
<tr>
<td>Others</td>
<td>27 (5.5%)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Master and above</td>
<td>110 (21.8%)</td>
</tr>
<tr>
<td>Bachelor</td>
<td>344 (68.3%)</td>
</tr>
<tr>
<td>Diploma and below</td>
<td>50 (9.9%)</td>
</tr>
</tbody>
</table>

Note: Based on China’s hospital accreditation system, Class III, Class II, and Class I hospitals roughly correspond to providers of tertiary care, acute care and primary care, respectively.

Source: author’s survey

### Table 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>504</td>
<td>0.50</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Age</td>
<td>504</td>
<td>36.29</td>
<td>7.95</td>
<td>21</td>
<td>60</td>
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<tr>
<td>Year of practice</td>
<td>504</td>
<td>12.87</td>
<td>9.14</td>
<td>14</td>
<td>42</td>
</tr>
<tr>
<td>Educational attainment</td>
<td>504</td>
<td>2.87</td>
<td>0.58</td>
<td>1 (diploma &amp; below)</td>
<td>4 (doctoral)</td>
</tr>
<tr>
<td>Perceived workload</td>
<td>504</td>
<td>2.24</td>
<td>0.72</td>
<td>1 (very heavy)</td>
<td>4 (very light)</td>
</tr>
<tr>
<td>Perceived relationship with patient</td>
<td>504</td>
<td>2.27</td>
<td>0.83</td>
<td>1 (&gt;51/day)</td>
<td>4 (&lt;10/day)</td>
</tr>
<tr>
<td>Monthly payroll</td>
<td>504</td>
<td>3.24</td>
<td>0.80</td>
<td>1 (&gt;410,000)</td>
<td>5 (&gt;44000)</td>
</tr>
<tr>
<td>Income satisfaction</td>
<td>504</td>
<td>2.84</td>
<td>0.38</td>
<td>1 (satisfied)</td>
<td>3 (dissatisfied)</td>
</tr>
<tr>
<td>Morale</td>
<td>504</td>
<td>2.48</td>
<td>0.69</td>
<td>1 (high)</td>
<td>3 (low)</td>
</tr>
<tr>
<td>Patients’ trust</td>
<td>504</td>
<td>2.84</td>
<td>0.79</td>
<td>1 (very high)</td>
<td>5 (very low)</td>
</tr>
<tr>
<td>Perceived relationship with patient</td>
<td>504</td>
<td>4.10</td>
<td>0.66</td>
<td>1 (very good)</td>
<td>5 (very bad)</td>
</tr>
<tr>
<td>Frequency of disputes (past 12 months)</td>
<td>504</td>
<td>4.40</td>
<td>0.85</td>
<td>1 (&gt;10/year)</td>
<td>5 (none)</td>
</tr>
<tr>
<td>Experience of patients’ trust</td>
<td>504</td>
<td>0.13</td>
<td>0.33</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Experience of lawsuits</td>
<td>504</td>
<td>0.02</td>
<td>0.14</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Frequency of defensive medicine</td>
<td>504</td>
<td>2.01</td>
<td>0.62</td>
<td>1 (often)</td>
<td>3 (never)</td>
</tr>
</tbody>
</table>

Note: *Workload is measured by the number of outpatient consultations per day.
Source: author’s survey
Respondents were also invited to recall the number of medical disputes they had encountered with patients over the past 12 months. Table 3 reports this frequency in terms of medical specialty. It is disturbing to note that almost half (44.80%; N = 226) of respondents had experienced at least once such incident. Internal medicine appears most prone to disputes, with 42.5% doctors in this area encountering 1–3 incidents, and 8.2% dealing with 4–6 disputes over the past 12 months. Surgery is another specialty prone to disputes, with more than 41.8% of surgeons in the sample having experienced at least one incident over the previous year.

Respondents who had experienced medical disputes were then invited to indicate the three most common types. Patients complaining to the hospital or health administration was the most frequently reported (N = 232), followed by verbal conflicts (N = 204). 64 physicians in the sample had been physically assaulted over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total. Echoing Chen’s (2007) conclusion, this survey also found that medical malpractice litigation was infrequent, with only 10 cases reported. Over the past 12 months, accounting for 12.7% of the total.

Finally, all physicians were invited to respond to the question probing their defensive medical practices. Just 19.4% (N = 98) physicians reported that they did not do so at all, whereas 61.9% (N = 312) indicated “sometimes” and 18.7% (N = 94) “often”. As discussed above, it is difficult to accurately measure defensive medicine using a survey due to the possibility of misreporting, but it is understandable that when physicians are asked to reveal irregular medical practices, they will tend to under-rather than over-report their frequency. In other words, this survey still provides a minimum estimate of defensive practices.

Ordered probit models were then used to analyze the factors associated with defensive behaviors. Table 4 presents the regression results. In the first model, the frequency of defensive behaviors was regressed on monthly payroll income, with gender, years of practice, education, specialty, technical title and hospital level controlled. Dummy variables were created for categorical variables, with the first category left as reference. Income was found statistically significant in explaining the dependent variable, suggesting that median- and low-income earners are more inclined to overprescribe as compared with the high-income group (>10,001 yuan per month). The statistical significance of years of practice and technical title can be explained by the fact that junior physicians are usually paid less, so they have a greater incentive to supplement their basic income by ordering more tests and procedures. Class III hospital was another critical predictor of defensive medicine. This was hardly surprising given their availability of various high-tech equipments and more opportunities in inducing demands.

The recent work of Wu et al. (2013) has demonstrated that self-perceived imbalances between effort and reward have significantly eroded the morale of Chinese physicians and may alter their behaviors. Inspired by this, the second model included workload as an explanatory variable. The strong association between defensive medicine and workload is arguably related to the relative fairness perceived by frontline physicians. Thus, the stark contrast between heavy workload and low pay may further motivate doctors to overprescribe to close the perceived gap in fairness.

We included physicians’ experiences of medical disputes in the past 12 months into the third model, with the hypothesis that they were positively correlated to a tendency toward defensive behaviors. The same pattern presented in the first model and second model largely remained. Previous disputes turned out a very significant predictor. Physicians who have experienced more disputes are more likely to behave defensively, arguably driven by the desire of avoiding troubles with patients.

7. Conclusion and policy implications

This article presents empirical findings from a survey of Chinese physicians. It has examined the widespread phenomenon of overprescription in Chinese hospitals from the perspective of defensive
medicine and provided an alternative explanation for this behavior. Drawing on the literature, this study broadens our understanding on the nature of defensive behaviors and argues that even when malpractice litigation is rare, physicians may still practice defensively because of self-perceived threats arising from the doctor—patient relationships. The existing literature tends to explain cost-inflationary behaviors of Chinese physicians by reference to the income target hypothesis, given their low-level of compensation. The escalating tension between Chinese doctors and patients over the past decade, however, raises an interesting question: do Chinese physicians practice defensive medicine in order to avoid troubles with patients? Using a cross-sectional survey, this study sampled more than 500 licensed doctors in Shenzhen City. The unique opportunity of selecting respondents in a random way has greatly improved the representativeness of the sample and reduced the potential threats to external validity resulted from small sample size. Although the case of Shenzhen could by no means be generalized to explain the whole situation of mainland China, this study represents an initial attempt to operationalize the concept of defensive medicine in the Chinese context and relate the changing patterns of doctor—patient relationship with physicians’ behaviors.

Primarily attention was focused on揣due physicians’axis prescribing behaviors from multiple perspectives. The results reveal wide discontent with income and workload, resulting in low morale. The frequency of medical disputes was high, as were the levels of perceived tensions with patients. Close to half of the survey respondents had experienced at least one dispute with a patient over the past 12 months. The actual amount of such conflicts varied from formal complaints to violence against the doctor. Malpractice suits were rare. Most physicians tended to regard patients as the source of conflict.

The survey has uncovered a rather disturbing fact: more than 80% physicians reported the practice of defensive medicine in the form of prescribing unnecessary diagnostic tests, drugs and therapeutic interventions. The frequency of such defensive behaviors was regressed on a set of explanatory variables as well as control variables, demonstrating that both past disputes with patients and low income motivated physicians to overprescribe. In summary, this study has shed fresh light on Chinese health policy by revealing the underlying reasons for the ubiquitous overprescription found in the country’s hospitals. It has demonstrated that Chinese physicians prescribe a vast amount of unnecessary tests, drugs and procedures, not only for monetary returns but also to avoid potential conflict with patients and retain essential evidence in the face of lawsuits.

This study has critical implications for China’s health policy reforms. Firstly, the crucial role of the doctor—patient relationship in altering physicians’ behaviors must be fully understood. A vicious cycle has emerged in which doctors overprescribe partly because patients do not trust them, but patients have become even more hostile to doctors as a result of hiking medical costs. Such rising tensions have strongly distorted the normal practices of physicians towards pervasive defensive medicine while compromising medical ethics. China must take decisive action to ameliorate these tensions and rebuild a healthy mode of interaction. This is, of course, easier said than done, because the existing situation mirrors the systematic dysfunction of the entire health system, rather than low trust between isolated individuals.

Nevertheless, several intermediary instruments are still on the table for policymakers to consider. For instance, the health administration of Fujian Province has launched compulsory medical malpractice insurance for medical professionals and the State Insurance Regulatory Commission has announced that similar insurance schemes will be gradually introduced to all medical institutions in the country (Caijing, 2014). This is expected to reduce physicians’ exposure to risks and normalize medical practices to a great extent. In addition, a number of cities have hired professional social workers to participate in conflict management between doctors and patients as third party. Pilot programs have demonstrated quite positive outcome, especially in facilitating communication and building trust between the two (Zhu and Liu, 2012).

Secondly, the findings indicate that low income continues to drive Chinese physicians to earn additional income, mainly from kickbacks and bonuses, by providing unnecessary care. There have been continuous calls in recent years for a substantive increase in doctors’ salaries (Xinhua News Agency, 2012), but decision makers must be very cautious before moving forward on this. While reforming the pay structure to better reflect the value of doctors’ work and provide a stronger motivation for performance improvement is certainly required, it would be naive to expect that such a change will immediately overcome the strongly perverse incentives that have been embedded in China’s hospitals for decades. The right way to go is to embrace the concept of pay-performance in doctors’ compensation, enabling them to respond to the right incentives. Therefore, pay reforms must be carried in close coordination with reforms of the provider payment schemes so as to ensure the compatibility of these new incentives.

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