MEDICAL LIABILITY: DO DOCTORS CARE?

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SUMMARY

To study the preventive effects of medical malpractice law one needs variation in malpractice pressure, across time or space. Since the 1970’s US states have enacted a variety of reforms in their tort systems. This variation has provided highly useful data to study preventive effects.

The empirical evidence shows that medical malpractice risk affects the behavior of health care providers. It has a negative impact on the supply of services, and it does seem to encourage the ordering of extra diagnostic tests. But the empirical evidence also shows that defensive medicine does not have a clear-cut effect on health. If the additional tests and procedures have any value, it is only a marginal one. It has further been found that changes in the supply of services do not affect health adversely. This suggests that the physicians that are driven out of business have a below average quality of performance. At the margin, medical liability law may have some social benefits after all.

These benefits must be weighed against the costs. Tentative calculations suggest that the benefits of even a modest reduction in injury rates suffice to offset reasonable estimates of overhead and defensive medicine costs.

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1 Introduction

Accident losses occur in many ways. People may, for instance, get hurt by a defective product, a car crash, an industrial accident, or a medical error. In each of these instances, the victim can invoke tort law, trying to obtain damage payments from the injurer. The tort system performs three important functions in society. It provides a forum for victims to be heard and to oblige injurers to make up for unduly risky behavior (corrective justice). It provides compensation for accident losses (distributive justice). And it provides incentives for potential injurers to take appropriate care and reduce the number of injuries (prevention or deterrence).

Economic analysis tends to emphasize the preventive function of tort law. The efficiency question is about minimizing the total costs associated with injuries, which includes on the one hand the costs of precautionary measures to avoid accident losses, and on the other hand the material and immaterial costs of the injuries that nonetheless occur. From this perspective, law and economics scholarship over the past 40 years has greatly enhanced our understanding of tort law.¹

But of course, theoretical analysis can not give a definite answer as to the performance of tort law in the real world.² Tort law may be rendered superfluous by other incentives to avoid accident losses. These include: moral principles, concern for the injurers’ own safety, market forces driving out unsafe products, and regulatory government programs directed at safety goals. Tort law may also turn out to be futile in its efforts for various reasons. Negligent conduct can be inadvertent. Liability insurance may reduce the incentive effects of the liability threat. And typical features of tort litigation, such as legal costs and uncertain verdicts, may withhold victims from filing a claim or induce them to accept a settlement that does not cover all losses.

Exactly how much deterrence tort law provides is ultimately an empirical question. However, it is not so easy to find the answer. For one thing, reliable data on the number of accidents, the frequency and severity of injuries, the level of care, and the costs of prevention are in general not readily available. Apart from data, one also needs variation in the tort rules, across time or space, for it is the differential impact that yields information on the effects of the rules. But to reliably compare outcomes across time or space, other social, economic and technological developments that might be responsible for the differences must be controlled for. For instance, one has to ascertain that the substantive effects of tort law can be distinguished from the effects which may be due to the process of litigation, the organization and regulation of the insurance industry, the remuneration structure of the health care sector, and governmental safety policies. A final remark relates to the fact that decisions on tort reform are not made within a political void. They are influenced by lobbying efforts from special interest groups. As a consequence, the relationship between tort law and the frequency and severity of accidents in society may well be bi-directional, and difficult to disentangle.

In this paper we study the preventive effects of tort law by focusing on medical malpractice law.³ Concentrating on this specific field of tort law has some important advantages. Medical errors are mostly one-sided, in the sense that only physicians can

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¹ Shavell 2004.
³ Other fields of tort law are discussed by Dewees et al. 1996 and Van Velthoven 2009.
take more or less care, not the patients. This one-sidedness makes the interpretation of empirical results more straightforward. Moreover, medical malpractice law has been studied extensively. In order to study the preventive effects of medical liability, one needs variation in malpractice law. Since the 1970’s, the US has experienced three medical malpractice crises, periods characterized by significant increases in the premiums and contractions in the supply of malpractice insurance. In response to these crises, US states have enacted a variety of reforms in their tort systems. As a result of all this, the US has seen a considerable variation, across time and space, in the pressure of the medical liability system on health care providers. This variation has provided highly useful data to study the preventive effects of tort law. Which is not to say that there is no relevant empirical material on other countries at all. But that material is rather sparse and does not allow us to sketch the full picture.  

The article is organized in the following way. In Section 2 we present the standard tort model from the law and economics theory and apply it to medical malpractice. Then we turn to empirics, concentrating on the US for the reasons just set out. In Section 3 we discuss the actual working of the US tort litigation system. How many victims of a medical error file a claim? And do they obtain adequate compensation? Section 4 addresses the key characteristics of medical liability insurance. It also gives an overview of the tort reform measures in response to the successive malpractice crises. Section 5 presents the main findings with respect to the preventive function of tort law. Does medical malpractice law provide adequate incentives for health care professionals to take appropriate care? Section 6 concludes.

One caveat is in order. Because of the availability of sufficient relevant data, findings on the preventive effects of medical liability primarily regard the US. The influence of liability can be expected to depend on the institutional context, which may vary in terms of medical liability insurance, hospital management and health care remuneration schemes, government regulation of quality and safety standards, and the disciplinary rules of the medical profession itself. Empirical studies for the US try to control for the variation in the institutional context across time and between states, to isolate the influence of liability. Thus, the findings may also be relevant in other settings. But, of course, when applying the results to other countries, the specific institutional context should be carefully taken into account.

2 Theory

In the economic analysis of tort law, a fundamental distinction is made between unilateral and bilateral accidents. In a unilateral case only one party to the accident, the potential injurer, can take precautionary measures to reduce the probability and/or severity of harm. The potential victim just can not help suffering damages. In a bilateral accident case both

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4 For countries outside the US, there is a considerable literature that discusses the frequency of medical injuries as a result of negligent care, the number of incidents that have been reported, and the handling of malpractice claims by the medical liability insurance sector for countries. See for the Netherlands, e.g., Zegers et al. (2009), Christiaans-Dingelhoff et al. (2011), Verkruisen (1993) and Van Velthoven (2008). But there is no relevant empirical material with respect to the preventive effects of malpractice pressure on the quality and quantity of care provided by health care professionals.
parties can take care in order to reduce the accident risk.

Medical injuries can generally be taken to be unilateral accidents. A physician who wants to reduce the probability and severity of medical injury can increase the number of visits provided to his patient, perform additional diagnostic tests, refer the patient to a specialist, opt for more or less invasive procedures, and/or take more care in performing surgery. The patient is usually unable to influence expected harm from a medical injury. When the physician’s behavior has actually caused harm to the victim, medical malpractice law quite universally holds the injurer liable for accident losses that are attributable to negligence. That is, the victim can only obtain damages if the injurer’s level of care has stayed behind the minimum level required by law.

For that reason we focus on the economic analysis of the negligence rule in case of unilateral accidents. We first give a general presentation of the standard tort model. Then we discuss the various problems if that model is applied to medical malpractice. This will help us to set the frequently used concept of defensive medicine in the proper perspective.

2.1 The standard tort model

The efficient level of care

Figure 1 sets the stage for a unilateral accident case, with the (potential) injurer’s level of care on the horizontal axis and the relevant costs on the vertical axis. Two different kinds of costs are distinguished. As the injurer raises the level of care by taking additional precautionary measures, his costs of care increase. But at the same time there is a reduction in the expected harm for the (potential) victim, as additional care may reduce the probability of an accident and/or the severity of accident losses.

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5 There are some exceptions of course, as a patient can more or less faithfully adhere to the medication, the life style rules and the physiotherapy prescribed by his physician.

From the point of view of society both kinds of costs are relevant, as they both use up scarce resources. The sum of the costs of care and the expected harm is given by the expected total costs curve. The social optimum is obtained if the expected total costs are at a minimum. The socially optimal level of precaution is frequently referred to as the efficient level of care.

The norm of due care
What level of care the injurer actually chooses depends on his personal incentives. These personal incentives do not necessarily lead him to the socially optimal level of care. It is here that the liability rule enters the picture.

The negligence rule presupposes a behavioral norm, specified by statutory law or jurisprudence, for the precautionary measures that the injurer should take at a minimum. This is called the norm of due care. If the injurer’s level of care falls short of this minimum, the injurer is said to be negligent and will be held liable for accident losses. On the other hand, if the injurer’s level of care equals or exceeds the due care norm, he will not be held liable.

The injurer’s expected costs depend on his choice of the level of care. If the injurer exercises less than due care, his expected costs are equal to the sum of his own costs of care and the expected damages he has pay to the victim. However, if he exercises at least due care he only has to bear the costs of care. As he is not liable for any harm, accident losses will remain with the victim.

Figure 2 shows the working of the negligence rule. The negligence rule creates a discontinuity in the injurer’s expected costs at the level of due care, as shown by the fat curve. The injurer minimizes his costs by just taking precautionary measures in conformity with the due care norm.
It then all depends on the proper choice of the due care norm, whether the injurer will act in a socially optimal manner. The injurer will take socially optimal precautions if, as in Figure 2, the level of due care specified by law coincides with the efficient level of care. If the due care norm is set below (above) the efficient level of care, the personal incentives will generally lead the injurer to behave in a suboptimal manner by taking too little (too much) precaution.

Observations
For a good understanding of the standard tort model we want to make three remarks.

First, it is important to note that it is generally not efficient to set due care at a level that induces maximum precaution. Because precaution is costly, it is not in society's interest to require injurers to take every available measure to eliminate even the slimmest of accident losses. Society is better off only as long as the marginal benefit from additional precaution (less expected harm) exceed the marginal costs (more costs of care).\(^7\)

Second, at the efficient level of care the marginal benefit from additional precaution will generally be positive. More care will further reduce expected harm, but this reduction of harm just does not make up for the additional costs.

Third, if the injurer conforms to the due care norm as prescribed by law, he will not be held liable for any accident losses. As illustrated in figure 2 a non-negligent injurer only has to bear the costs of care. Consequently, a non-negligent injurer is not confronted with the full social costs of his activity.\(^8\) This may lead the injurer to undertake too many activities from a social point of view.

2.2 The standard tort model applied to medical malpractice
As noted before, medical injuries can generally be taken to be unilateral accidents. Moreover, medical malpractice law generally follows the negligence rule. That makes it tempting to apply the standard tort model set out in Figure 2. We then might infer that medical malpractice law can induce physicians to take efficient care. Setting the due care norm at the efficient level of care just would do the trick.

This would, however, be jumping to conclusions. In practice, a number of specific characteristics of medical care and medical malpractice litigation pose serious problems to a straightforward application of the standard tort model. We shall discuss these problems one by one.

Uncertainty about due care
The standard tort model suggests that injurers can be induced to provide socially optimal care, if law sets due care at the efficient level. This simple rule, however, is not easily met in the health care sector, for the following reasons:

- It is rather difficult to determine the efficient level of care with a reasonable degree of certainty, even for specialists in the field. Hence, it is generally impossible for law to set the due care norm precisely right. Instead, the courts evaluate the conduct of physicians almost exclusively in terms of customary standards of practice within the

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\(^7\) In terms of Figure 2: as long as the slope of the expected harm curve is steeper than the slope of the costs of care curve. At the efficient level of care these slopes are equal.

\(^8\) In the terminology of economics: his behavior has a negative external effect.
medical profession.\textsuperscript{9}
- Physicians on their part are no legal experts. They generally have no exact insight into the due care norm that will be applied by the courts when confronted with a claim.
- When it comes to court proceedings, the judge has to decide whether in the specific case the physician has been careful enough. Even if the due care norm is right, the judge may err in his decision, as the information presented to the court will generally be incomplete and subject to mistakes in interpretation. Consequently, physicians do not know exactly how careful they have to be in order to escape liability. Calfee & Craswell (1984) have studied the consequences. If there is uncertainty about the due care norm and its application in court, there is a chance that a physician who has taken sufficient care may still be held liable for damages. The physician can try to reduce that chance by \textit{overcomplying}, that is, by raising his level of care beyond due care. The increase in his costs of care may well be outweighed by the reduction in his expected damage payments.

\textbf{Who bears the costs of care?}
The standard tort model starts from the premise that the costs of care are borne by the injurer. This is, however, not self-evident in the health care sector, as physicians are generally paid on a fee-for-service basis. Moreover, most patients carry a health insurance policy. When a physician decides to raise the level of care, by increasing the number of visits, performing additional tests, or carrying out a more invasive procedure, he will not have much trouble in charging the additional costs to his patient, who will forward the bill to his insurance company. The patient in general will not refuse the extra care, as the physician can readily explain that it will have a positive effect on his health.\textsuperscript{10}

If it would be true that the physician can pass on any additional care costs, it is easily seen from Figure 2 that he will be tempted to choose a level of care well above the due care norm. For one thing, it isolates him from any uncertainty about the court’s interpretation of due care. Moreover, not providing potentially beneficial care tends to go against the ethics of his medical profession.

The financial incentive to provide too much care will of course be mitigated if health care services are financed in a different way, that hinders or prevents the passing on of additional care costs. One can think of: pure salary payment, capitation payment, or managed care plans.\textsuperscript{11}

\textbf{Litigation problems}
The standard tort model takes it for granted that the injurer pays damages, once he is found to have exercised less than due care. In general, however, this payment will not be made spontaneously. The injurer will wait until the victim takes action. This means, first, that the victim has to decide whether it is in his interest to file a claim. Maybe the patient is not aware of the negligence of his physician, maybe it is too uncertain what the judge will decide, maybe the litigation costs are too high, maybe the financial means of the

\begin{itemize}
  \item \textsuperscript{9} Weiler et al. 1993, p.8.
  \item \textsuperscript{10} Cf. the second observation at the end of Section 2.1. That the positive health effect may be small in relation to the costs is another matter.
  \item \textsuperscript{11} Glied 2000.
\end{itemize}
victim are insufficient. Second, even if a claim is filed, parties may decide to settle the case in the shadow of the law, in order to save on litigation costs. The patient will have a subjective probability to prevail in court, but this probability will in general not be equal to 100%. Moreover, this subjective probability presumably will not match the subjective probability of the physician. Economic analysis of litigation suggests that a dispute may only result in a trial if the parties’ subjective probabilities of prevailing add up to more than 100%. If the case is settled, damages will not amount to a full compensation.

The implication of all this is that the injurer can safely reckon with average damage payments on his account that fall short of the expected harm of his behavior. This will clearly dampen the injurer’s incentive to conform to the due care norm required by law. The result is a tendency towards insufficient care.

**Liability insurance**

The incentive effect is further diminished, if the physician carries insurance against the financial consequences of malpractice. The insurance policy shifts the burden of the damages the injurer eventually has to pay to the insurer. Medical malpractice insurance thus lowers the injurer’s costs of insufficient care.

In theory, experience rating can redress this tendency. Experience rating refers to a variety of schemes that see to it that liability insurance premiums more or less accurately reflect each insured’s expected loss. This is mostly done by varying premiums with past claims or loss experience. Shavell (1982) has shown that insurance need not interfere with the incentive effects of liability if premiums are perfectly experience rated. But experience rating is more easily said than done in the case of medical care. Medical malpractice claims occur too infrequently to give insurance companies enough information to reliably set premiums in accordance with individual physician’s care levels.

Medical malpractice insurance, however, does not completely eliminate incentives to take care. Malpractice may affect the physician severely, even if he is fully insured against the direct financial consequences of legal assistance and damages. For claims also bring along other kinds of costs. The defense may take quite a lot of his precious time, the experience is rather unpleasant, and it may cause serious reputational harm.

**Conclusion**

The preceding analysis has shown that the negligence rule in medical malpractice law does not necessarily lead to a socially optimal level of precaution, not even if the due care norm is set equal to the efficient level of care. The incentives are distorted. For one thing, physicians generally do not bear the full accident losses of insufficient care, as a result of problems in the litigation process and the omnipresence of medical liability insurance. This distortion may act as an invitation to physicians to take less care than legally required. Still, the nonfinancial consequences of liability (time, hassle, reputation loss) may provide some counterweight. Other distortions provide incentives to act on the safe side of the due care norm. Physicians generally do not bear the (full) costs of care due to specific methods of financing in the health care sector. And there is uncertainty about the

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due care norm and its application by the courts. On balance, there might be a bias towards excessive care.

2.3 Defensive medicine

In an ideal world, medical liability would put just so much pressure on physicians that they would take the efficient level of care. In reality, especially in the US, the conviction has taken root among physicians and their liability insurers that the malpractice system has gone too far. It is argued that the pressure has evolved to such a level, that it has given rise to defensive medicine. The most common definition reads: “Defensive medicine occurs when doctors order tests, procedures, or visits, or avoid high-risk patients or procedures, primarily (but not necessarily solely) to reduce their exposure to malpractice liability.”

According to this definition, defensive medicine can take two forms. Positive defensive medicine involves supplying care that is not cost effective, unproductive, or even harmful. Negative defensive medicine involves declining patients that might benefit from care. It also includes physicians deciding to exit the profession altogether.

However straightforward the concept of positive defensive medicine may look at first sight, it is not immediately clear from the standard tort model that this kind of defensive medicine may actually apply. On theoretical grounds it has been deduced above that malpractice pressure on the physicians’ choice of care level is working in two directions. On balance, there might be a bias towards excessive care. Thus, the question whether physicians supply too much care is really an empirical question.

Second, if malpractice pressure does produce a bias towards excessive care, it is excessive in comparison to the due care norm. However, there is in general no guarantee that the due care norm has been set equal by law to the efficient level of care. That leaves the possibility, even if empirical research finds proof of excessive care, that that level of care still falls short of the socially optimal amount.

The concept of negative defensive medicine is related to the level of activities, referred to at the end of Section 2.1. If a physician takes at least due care, he will not be liable for any accident losses. He does not bear the full costs of the patients’ treatment, which gives him the incentive to accept too many patients from a social point of view and/or to stay too long in the profession. However, the simple fear of malpractice claims, even if unwarranted, and the corresponding threat of time and reputation loss may work in the opposite direction. This malpractice liability risk might induce him to reject patients or to relocate his activities. On balance, there might be negative defensive medicine in the sense defined above.

But note that things change, if the physician exercises insufficient care. Then, malpractice law can help patients to file claims and to obtain damage payments. And this gives the negligent physician a good reason to revise his conduct, not only by raising his level of care, but also by accepting fewer patients or by early retiring. Such a behavioral response would be very welcome from the point of view of society.

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16 Sloan & Shadle 2009, p.481.
3 The tort litigation system

This section surveys the empirical evidence concerning medical liability litigation. To what degree are injurers actually confronted with the accident losses they bring about by their behavior? Let us take a look at the different layers of the dispute pyramid.\textsuperscript{17}

Three large-scale surveys of medical records of hospitalized patients in the US have investigated the incidence of injury due to medical care and the subset caused by negligence. The most recent study was done in Utah and Colorado in 1992.\textsuperscript{18} It was found that 2.9\% of the patients had an adverse event that was related to medical care, of which 29\% involved a negligent act or omission. Thus, some 0.8\% of all hospitalized patients suffered a negligent injury. A negligent injury was defined as the consequence of treatment that failed to meet the standard of the average medical practitioner. No attempt was made to define negligence by weighing marginal costs and benefits of additional precautions. So, the resulting count of negligent injuries does not necessarily correspond to economically inefficient injuries.

The second layer of the dispute pyramid discloses how many of the injury victims take steps to obtain compensation. In the Utah and Colorado study, only 3\% of the patients who were identified as having sustained a negligent injury filed a malpractice claim. Thus, claims lag well behind the incidence of negligent injury. But there is also a significant number of ‘false positives’ among medical malpractice claims. Aggregate data from insurers’ records pointed out that a substantial number of malpractice claims do not correspond to an identifiable injury due to negligent medical behavior. Of course, all these plaintiffs may still have filed the claims in good faith, from a state of imperfect information, leaving it to the tort system to separate the rightful claims from the non-deserving ones.

The third layer of the dispute pyramid discloses how filed claims fare in the tort system. Studdert et al. (2006) analyzed a large sample of malpractice claims closed between 1984 and 2004. In this sample, 61\% of claims could be associated with injury due to medical error, while 39\% of the claims had no merit. Only 15\% of all the claims were resolved by trial verdict, the rest was settled in the ‘shadow of the law’ or dropped. Most of the claims involving injuries due to medical error (73\%) received compensation, most claims not involving medical error (72\%) did not receive compensation. Moreover, when claims involving error were compensated, payments were significantly higher on average than were payments for non-error claims.

With respect to the payment amounts two observations are in place. First, compensation in most cases falls short of plaintiff’s losses, especially for more serious injuries.\textsuperscript{19} Second, the costs of administering the tort system are considerable. At the US national level, total administrative costs (legal expenses of plaintiffs and defendants, overhead costs of insurers and hospitals) are estimated to be $4.1 billion, against net indemnity payments of $5.7 billion.\textsuperscript{20} Apparently, it costs society overall more than $1.70 to deliver $1 of net compensation.

\textsuperscript{17} Van Velthoven 2009 gives more details and references.
\textsuperscript{18} Studdert et al. 2000.
\textsuperscript{19} Sloan & Chepke 2008.
\textsuperscript{20} Mello et al. (2010).
The tort litigation system is not perfect, then. It sometimes makes physicians - or their insurers - pay damages for non-negligent care. But the system is clearly not a random lottery. It can be calculated from the figures cited above that negligent injuries are at least ten times as likely to end up in compensatory payments as non-negligent injuries. More disturbing for the proper working of the system seems to be the high rate of ‘false negatives’. For the figures above suggest that just some 2% of the patients with negligent injuries get compensation, mainly because a large fraction of valid claims is not filed, but to a lesser degree also because not all valid claims that are filed get honored. Combining that result with the finding that compensation generally falls short of victims’ losses suggests that the deterrent function of the system tends to be rather limited.

4 Medical liability insurance and tort reform

The previous section gave an overview of the operational behavior of the tort litigation system. Two highly related issues were left aside: medical liability insurance and tort reform. We now give some details.

4.1 Medical liability insurance

Physicians generally carry a malpractice insurance policy. Conventional wisdom holds that the most common policies sold by insurers provide $1 million of coverage per incident and $3 million of total coverage per year. But that coverage may be exaggerated. Zeiler et al. (2007) found for Texas that physicians with paid claims in 2003 carried policies with a median limit of $500,000 per incident only.

Medical malpractice premiums differ widely. Premiums paid by traditional high-risk specialties, such as obstetrics and surgery, are usually higher than premiums paid by other specialties. Premium rates also vary geographically across and within states. However, there is no experience rating of premiums at the level of the individual physician. Nor are deductibles or other co-payments used on a regular basis.

For hospitals, the situation is somewhat different. After the first tort crisis in the mid 1970s, many hospitals found it difficult to obtain insurance and turned to self-insurance or to mutual companies with at least some experience rating.

Calculations by Jena et al. (2011) point out that each year nationwide 7.4% of all physicians are confronted with a malpractice claim, with only 1.6% having a claim leading to a payment. There is a great variation in claim rates across specialties, ranging from 2.6% to 19.1%, and in average indemnity payments, ranging from $117,000 to $521,000.

The financial costs related to these claims (indemnity payments, defense costs) are in general more or less fully covered by the insurance policies. In only 1 or 2% of all cases do physicians use their own personal assets to resolve claims, with a median of some $50,000.

21 GAO 2003, p.6.
22 Danzon 2000.
4.2 Malpractice crises and tort reform

In the past decades, the US have experienced three ‘crises’ in the malpractice insurance market. These were periods of deterioration in the financial health of carriers, followed by sharp increases in premiums and contractions in supply. The first crisis occurred in the mid 1970s and remained confined to a number of states. The next ones in the mid 1980s and the first years of the new millennium were much more general. Although this is not the place to delve deeply in the causes of these crises, one factor should be singled out: the ‘long tail’ character of this line of insurance. Claims may be filed many years after an adverse event causes injury. And from there it may take many more years before the insurance company finally knows how much compensation it has to pay. If, for whatever reason, there is a gradual rise in claim frequency and/or in average payments, for instance because of pro-plaintiff adaptations in common law doctrines or because patients are becoming more assertive towards health care professionals, insurance companies will tend to lag behind. They will develop unexpected losses, and overreact in raising premiums and curtailling supply.

In response to the malpractice crises most US states have adopted tort reform measures. The objective of these measures is to reduce the overall costs of medical liability. The extent and specifics of tort reform vary from state to state. Some reforms make it more costly or difficult to file tort cases, other reforms aim at a reduction of damage awards. The following list gives an overview of the tort reforms most commonly adopted:

- **shorter statutes of limitation**: limit the amount of time a patient has to file a malpractice claim after the occurrence or discovery of the injury.
- **contingency fee reform**: limits the amount of a damage award that a plaintiff’s attorney may take in a contingent fee arrangement.
- **pretrial screening panels**: review a malpractice case at an early stage and assess whether a claim has sufficient merit to proceed to trial.
- **caps on damages**: limit the amount of money that a plaintiff can take as an award. The cap may apply to noneconomic damages (pain and suffering), total damages, or only punitive damages.
- **joint-and-several liability reform**: limits the financial liability of each individual, in cases involving more than one defendant, to the percentage fault of the individual.
- **collateral source rule reform**: eliminates the traditional rule that any compensation a plaintiff receives from other sources, such as health insurance, should not be deducted from the damage award.
- **periodic payment**: allows or requires insurers to pay out malpractice awards over a longer period of time, rather than in a lump sum.

The effects of these tort reforms on the frequency and the size of claims and on malpractice insurance premiums have been studied extensively. A detailed review by Mello (2006) concludes that there is no convincing evidence that the reforms have had any significant impact on claims frequency. The evidence with respect to average damage payments and insurance premiums is somewhat more favorable. But here, only one

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25 A listing of tort reforms by state over time can be obtained from www.atra.org.
reform measure really stands out. Caps on (noneconomic) damages have a significant effect on average damage payments, typically on the order of a 20 to 30% reduction. Damage caps also help to constrain the growth of premiums over time. This specific kind of tort reform apparently can help, if so desired, to relieve malpractice pressure.

5 Preventive effects of tort law

It is an empirical question whether tort law leads physicians to take appropriate precautions or to engage in defensive medicine. In the literature three main research lines can be distinguished. The first line of research surveys physicians and asks their opinion on the role of malpractice pressure in clinical practice. The second line is about the actual relevance of positive defensive medicine. How do treatment choices by physicians, and the health outcomes of their patients, respond to malpractice pressure? The third line is on negative defensive medicine and analyzes how malpractice pressure affects the supply of health care services.

5.1 Survey studies

Survey studies among physicians unequivocally point out that concerns about malpractice liability are pervasive among physicians. Carrier et al. (2010) report, for instance, that 78% of physicians agree with the statement that it is becoming increasingly risky to rely on clinical judgment rather than diagnostic testing because of the threat of malpractice suits. Indeed, physicians report significant changes in their clinical practice in response to the perceived malpractice threat. They order more tests and procedures, take more time in explaining risks, reduce the number of patients, restrict the scope of their practice. Most common is ‘assurance behavior’: ordering more diagnostic tests and referring patients to other specialists.

Thus, these survey results point to an overall presence of defensive medicine. Yet, they should not be adopted without caution. First, the relationship between perceived malpractice threat and objective liability risk is found to be very modest. Physicians systematically overestimate the risk that malpractice action will be brought against them. Second, the relationship between malpractice threat and clinical response is a self-reported one.

It remains to be seen whether the impact of medical liability is borne out by figures on actual medical decisions, controlling for other relevant factors, and whether the impact should be evaluated as defensive medicine or rather as a real contribution to health care quality.

5.2 Positive defensive medicine

The second line of the empirical literature concerns the impact of (changes in) tort law on the physicians’ level of care and on the frequency and severity of injuries.

Much attention has gone to obstetrics, the field that has one of the highest levels of premiums, claim frequency and damage payments. Typically, studies examine the impact

of tort law on cesarean section rates. Cesarean sections are a treatment thought to be more frequently adopted in risky situations under the influence of malpractice pressure. Malpractice pressure is measured in various ways: through mean liability premiums, mean perceived liability risk, mean number of claims, mean amount of damage payments, personal claim experience, or the presence yes/no of tort reform measures. Older studies mostly have samples of births and/or obstetricians from one state at one specific point in time. The effects of tort law are derived from variation between physicians or between countries in malpractice pressure on the one hand and cesarean section rates on the other hand. More recent studies use panel data for US states. The studies of course try to control for a variety of other relevant factors, such as medical risk of mother and child, characteristics of physician and hospital, and demographic and socio-economic factors of the state.

Several authors do find empirical evidence that higher malpractice pressure raises the probability of delivery by cesarean section.\textsuperscript{29} Other authors, however, report the opposite effect\textsuperscript{30} or find no effect at all.\textsuperscript{31} Dranove & Watanabe (2010) go into some detail. They observe an increase in an obstetrician’s cesarean section rate after a claim has been brought against him, but this effect is short-lived and limited to the first claim. This suggests that obstetricians overreact to their first claim, and rapidly discover that the litigation process is neither costly nor particularly painful.

Some studies have also looked at the impact on infant health at birth. Sloan et al. (1995) Dubay et al. (1999) and Yang et al. (2012) could not find a significant effect of malpractice pressure, while the results by Currie & McLeod (2008) on caps on noneconomic damages are mixed.

Overall, then, the results are inconclusive. There is no decisive evidence for positive defensive medicine in obstetrics.

Kessler & McClellan (1996, 2002a,b) focus on a rather different field of medicine, cardiac illness. Their findings indicate that tort reform measures that directly limit liability, such as caps on damage awards, reduce hospital expenditures by 5-9 percent. Reforms, on the other hand, do not lead to any consequential differences in mortality or the occurrence of serious complications. This suggests that a reduction of malpractice pressure clears the way for physicians to save on tests and procedures, without any negative effect for the patients. Apparently, the tests and procedures in question were essentially needless, and thus a form of positive defensive medicine.

It is also interesting to note that the reduction in defensive practices achieved through direct tort reform tends to be smaller in areas with high managed care enrollment. Managed care seems to reduce physicians’ incentives and ability to engage in defensive treatment. In that sense, tort reform and managed care are substitutes.

The results by Kessler & McClellan, however, have not gone uncontested. In a study by Dhankhar et al. (2007), higher medical malpractice risk leads to a choice of procedure that is less invasive for heart patients, and cost saving too. Interestingly enough, health outcomes of patients improve. Thus, malpractice law would seem to induce physicians to

provide better suited and more efficient care.

Still other studies take a look at broader sets of ailments or total health care expenditures. The results are mixed. Some authors find no evidence that direct tort reforms reduce medical spending. Other studies confirm the results by Kessler & McClellan. That is, malpractice pressure does seem to lead to positive defensive medicine. That conclusion should, however, be read with an important reservation. As far as physicians are found to practice positive defensive medicine, the excessive care appears to be related to rather elementary diagnostic tests such as imaging, not to major surgical procedures. The overall picture is that the total effect on health care costs, if any, is rather small.

5.3 Negative defensive medicine

The third line of empirical research examines how the medical malpractice crises of the past decades have affected the supply of health care services.

The results with respect to obstetrics are mixed. Rosenblatt & Wright (1987) report that general practitioners and family doctors tended to decrease or stop their obstetric practice because of professional liability issues, while Dubay et al. (2001) find that malpractice pressure resulted in prenatal care beginning later in the pregnancy. Dranove & Gron (2005) and Yang et al. (2008), on the other hand, do not find a relationship.

Other studies analyze the overall supply of physician services. All results point in the same direction. Higher malpractice pressure tends to diminish health care supply, be it the number of physicians, statewide or in local areas only, or their hours worked. That finding seems to be definite proof of negative defensive medicine. But note that the interpretation is not so obvious. A smaller supply of physicians in itself can be presumed to contribute negatively to social welfare, but there may also be offsetting effects if the quality of the physicians that stop or reduce their practice is below average. Indeed, Dubay et al. (2001) and Klick & Stratmann (2007) find no evidence that the changes in supply had negative health effects.

6 Conclusions

In this paper we have looked at the preventive effects of medical malpractice law. Our starting point was the standard model as presented in the law and economics literature. In principle, the negligence rule may induce physicians to take efficient care. In practice, a number of factors distort the incentives provided by the negligence rule: uncertainty about the due care norm, the remuneration structure of health care services, problems in the process of litigation, and medical liability insurance. Also, non-financial consequences of liability claims may affect the behavior of physicians.

33 Hellinger & Encinosa 2006, Baicker et al. 2007, Thomas et al. 2010, Smith-Bindman et al. 2011
35 Thomas et al. 2010.
37 Seabury 2009.
Because these factors work in opposite directions, the effect of medical malpractice law is ultimately an empirical question. To single out the effect, one needs variation in medical malpractice pressure, across time or space. That variation is provided by US data. In the literature three lines of research can be distinguished. First, survey research indicates that physicians are inclined towards defensive medicine. Second, findings on the effect of malpractice pressure on the actual level of care are mixed. If indeed physicians are providing excessive care, it seems to refer to elementary diagnostic tests, not to major surgical procedures. Third, as malpractice liability risks go up, health care supply tends to shrink.

Thus, medical malpractice risk is found to affect the behavior of health care providers. It has a negative impact on the supply of services, and it does seem to encourage the ordering of extra diagnostic tests. But that still leaves two important questions. First, what is the net impact on health? And second, how is the balance of costs and benefits?

The empirical evidence shows that positive defensive medicine does not have a clear-cut effect on health. If the additional tests and procedures have any value, it is only a marginal one. It has further been found that changes in the supply of services do not affect health adversely. This suggests that the physicians that are driven out of business have a below average quality of performance. At the margin, medical liability law may have some social benefits after all.

These benefits must be weighed against the costs of the additional tests and procedures. The costs of administering malpractice claims also deserve attention. For it takes society overall more than $1.70 to deliver $1 of net compensation. Both Danzon (2000) and Lakdawalla & Seabury (2009) have made a shot at a back-of-the-envelope calculation of the costs and benefits. They conclude that under quite general assumptions the benefits of even a modest reduction in injury rates suffice to offset reasonable estimates of overhead and defensive medicine costs. This follows from the large social costs of medical injuries and the low rate of claims per negligent injury.

Yet, instructive as these calculations may be, they mainly have a heuristic value. First, a full cost-benefit evaluation of the medical liability system is impossible in the current state of affairs. Second, even if the marginal benefits of the current system do outweigh the costs, the search for improvements and alternatives is open. But that is a topic for another article.

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