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Medical malpractice: Impact of the crisis and effect of state tort reforms

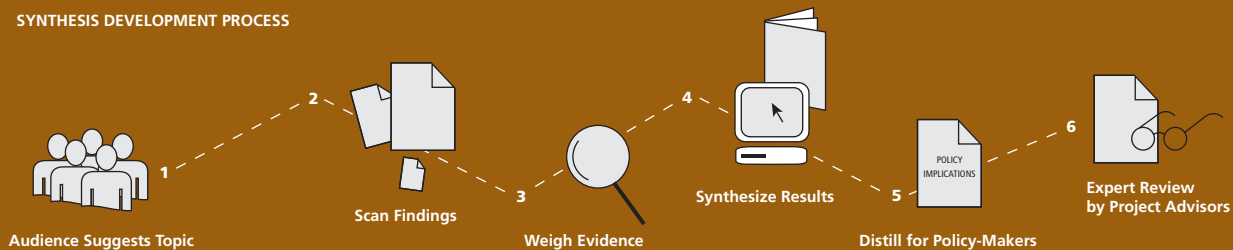
See companion Policy Brief and Primer available at www.policysynthesis.org

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THE SYNTHESIS PROJECT (Synthesis) is an initiative of the Robert Wood Johnson Foundation to produce relevant, concise, and thought-provoking briefs and reports on today's important health policy issues. By synthesizing what is known, while weighing the strength of findings and exposing gaps in knowledge, Synthesis products give decision-makers reliable information and new insights to inform complex policy decisions. For more information about the Synthesis Project, visit the Synthesis Project's Web site at www.policysynthesis.org. For additional copies of Synthesis products, please go to the Project's Web site or send an e-mail request to pubsrequest@rwjf.org.

SYNTHESIS DEVELOPMENT PROCESS



Introduction

Many U.S. states are now in their fifth year of a medical malpractice “crisis”, a period of volatility in the malpractice insurance market characterized by above average increases in premiums, contractions in the supply of insurance and deterioration in the financial health of carriers.¹

Improving insurer financial ratios suggest that the malpractice crisis is now abating in some states, but malpractice crises are a recurring problem. This has been the third period of rapidly rising premiums in the last 30 years, following crises in the mid-1980s and mid-1970s. States, which are responsible for regulating malpractice insurance, have enacted a variety of reforms to prevent or temper malpractice crises, but there is a paucity of reliable information available to policy-makers about the effects of these reforms and the impact of the malpractice crisis on health care delivery. While a voluminous number of reports have been produced, most are not based on rigorous analysis. There are several studies that appear trustworthy, however, and the substantive findings in this Synthesis Report are based on those studies.

This Synthesis Report examines the evidence on these questions:

- How does a volatile malpractice environment affect health care delivery?
- What has been the impact of state tort reforms on premiums, claims frequency, claims payouts and physician supply?

While the weight of the evidence suggests that the malpractice crisis has had a modest effect on physician supply, the evidence base is not yet adequate to draw conclusions about whether patients’ access to high-risk services has been compromised as a result. The literature evaluating state tort reforms, while problematic due to methodological issues, does offer some useful findings. Caps on noneconomic damages are the most common and most effective reform, although they disproportionately burden the most severely injured patients.

This Synthesis Report is one in a series addressing medical malpractice insurance issues. The series also includes a Primer, which describes how medical malpractice insurance works and the causes of malpractice crises, and a Policy Brief, which summarizes the findings of this Synthesis Report.

¹ Some crises are characterized by both premium increases and supply contractions, while others have one but not both of these phenomena.

How does a volatile malpractice environment affect health care delivery?

Physician and insurer groups have claimed that rising insurance costs have led physicians to reduce services by:

- Retiring early.
- Relocating their practice to other states where insurance costs are lower.
- Restricting their scope of practice to exclude or reduce high-risk procedures or avoid high-risk patients. For example, obstetrician-gynecologists are said to be confining their practice to just gynecology, or to normal but not high-risk deliveries.

These claims have been supported more by anecdote than by hard data, particularly in the early years of this malpractice crisis. More reliable evidence has begun to emerge, but remains limited. The extent to which these physician responses are occurring is a key policy issue because it potentially broadens the malpractice crisis from a problem for providers and malpractice carriers to a consumer health care access issue.

Researchers can evaluate these claims in several ways, but each is problematic (see Appendix II). While they have shortcomings, administrative datasets such as the American Medical Association’s Physician Masterfile are the best available sources of information about trends in the number of practicing physicians over time. Physician survey data are a better source of information about why physicians choose to stop practicing or move their practice, but because of response bias (discussed below), they produce less reliable estimates of the number of physicians who do so.

A number of studies have used one of the physician databases to measure physician supply and tested the relationship between supply and measures of the liability climate using multivariate regression analysis (Figure 1).² Some of these studies have directly modeled the relationship between physician supply and indicators of the litigation environment, such as insurance premiums, claims frequency, or claims payments in a state. Others have used tort reform laws to measure malpractice risk, a less direct measure of the liability climate. A key issue in physician-supply studies is adequately controlling for various market characteristics, aside from liability, that may affect physician supply. A few studies have used “difference-in-difference” analysis, which compares the amount of change in physician supply in each state over time, to implicitly control for all state characteristics. Most studies use cross-sectional analyses that explicitly control for state characteristics by including them as explanatory variables in the model. Both are good methodologies if all the relevant variables are included in the model and the data are good measures of the variables. The studies we characterize as particularly strong have these features.

Three studies have found a significant association between malpractice risk and physician supply, three had no significant findings and two had mixed results. The results did not vary systematically with the particular measure of malpractice risk used: among studies modeling the effect of caps on noneconomic damages and other tort reforms on physician supply, for example, two studies had significant findings, one did not, and two were mixed.

² Multivariate regression is a statistical technique used to test the effect of one explanatory variable (e.g., malpractice premium levels) on an outcome variable (e.g., state physician-to-population ratio) while holding many other variables constant. It is useful for examining variations in physician supply across states because it lets the analyst control for characteristics on which states may differ and which may affect physician supply—for example, the average gross income of physicians in the state. Just examining the association between malpractice insurance premiums and physician supply in a state without controlling for these other “confounding variables” might lead to a spurious conclusion that variations in supply are due to differences in premiums.

Findings

Figure 1. Results of controlled studies on effect of malpractice environment on physician supply†

Authors	Malpractice risk measure	Data years	Findings
Baicker & Chandra 2005 (2)	(1) Premiums (2) Claims payments	1993–2001	Not significant. Neither premiums nor payments were significantly associated with overall physician supply. Methodological comments: Strong analysis overall. <i>Strengths:</i> Controls for a good range of confounding variables. Separately tests effects on physician subgroups. <i>Limitations:</i> Inappropriate averaging of company-specific premium data.
Kessler et al. 2005 (23)	“Direct” and “indirect” tort reforms	1985–2001	Significant. Direct reforms (e.g., caps on damages) were associated with three percent higher growth in physician supply after three years. The effect size varied by specialty, e.g., 12 percent difference for emergency medicine physicians but no significant difference for surgeons or radiologists. The effect was mainly due to retirements and entries rather than inter-state relocations. Methodological comments: Strong analysis overall. For more information, see Appendix III.
Matsa 2005 (27)	Caps on damages	1970–2000	Not significant. The association between caps and overall physician supply was not significant, although caps did increase supply 10–12 percent from 1970 to 2000 for specialists in extremely rural areas. Methodological comments: Strong analysis overall. For more information, see Appendix III.
Encinosa & Hellinger 2005 (13)	Caps on damages	1985–2000	Mixed. Counties subject to any damages cap (whether \$250,000 or higher) had two percent more physicians per capita than counties without caps (three percent in rural counties); the difference was statistically significant. However, results not published in the paper showed, counterintuitively, that the \$250,000 cap was not significant but the higher cap was. Methodological comments: Fairly strong analysis overall. For more information, see Appendix III.
Erus 2004 (14)	(1) Premiums (2) AMA deems state in “crisis” (3) # claims (4) Claims payments	1997–2002	Not significant. None of the indicators of malpractice risk showed a significant association with physician supply. Methodological comments: Preliminary analysis, not yet perfected. Model requires more work before it can be deemed reliable. <i>Strengths:</i> Examines data through middle of current malpractice crisis. <i>Weaknesses:</i> State-level model did not identify any significant predictors of physician supply, and some findings are counterintuitive.
Gius 2000 (17)	Premiums	1994–1996	Significant. States with above-average medical malpractice insurance premiums had significantly fewer physicians per capita. Methodological comments: Fairly strong analysis overall. <i>Strengths:</i> Model estimation method controls for endogeneity (two-way causation) between physician income and physician supply. <i>Weaknesses:</i> Exact nature of premium data is unclear. Does not examine dynamics during times of malpractice crisis.
Hellinger & Encinosa 2003 (20)	Caps on damages	1985–2000	Significant. States with caps have, on average, 12 percent more physicians per capita than states without caps, although physician supply grew in both types of states. Methodological comments: Not a strong analysis overall. For more information, see Appendix III.
Klick & Stratmann 2003 (24)	Caps on damages	1980–1998	Mixed results. Counterintuitively, the \$250,000 cap was not significant but the \$500,000 cap was. States with the higher cap had three percent more doctors per 100,000 population than states without them. Methodological comments: Not a strong analysis overall. For more information, see Appendix III.

† The dependent variable in all studies is the number of physicians in the state or number per capita as listed in the American Medical Association Physician Masterfile, except for Baicker and Chandra, who modeled the difference in the log number of physicians between 1993 and 2001. The strongest studies are cited in bold print.

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The strongest studies have found that the malpractice environment has had only small or no effects on the supply of physician services overall, although the impacts in certain specialties and in rural areas are somewhat higher. The most informative and reliable results may be those of Baicker and Chandra (2) because their study used a direct measure of liability costs (professional liability insurance premiums) rather than an indirect measure (tort reforms) and estimated a well-specified model. That study found no significant association between premiums and physician supply. The strongest study using caps on damages as the measure of the liability climate is that of Kessler and colleagues, who found that caps were associated with three percent higher growth in physician supply three years after they were adopted (23). Most studies have not been designed to test whether some medical specialties are affected more than others, but Kessler and colleagues' study did find some inter-specialty differences.

Survey studies also shed light on the relationship between liability costs and physician supply. As discussed in Appendix II, survey studies have both strengths and weaknesses compared to other approaches. The biggest weaknesses are low response rates and risk of response bias. One strong survey study (with a high response rate, strong sampling design and well-designed survey instrument) is a 2003 study of physicians in specialties with high malpractice risk in Pennsylvania, one of the states most severely affected by rising insurance costs (30). This study found that only a small proportion of specialists definitely planned to retire early (seven percent) or relocate their practice out of state (four percent) within the next two years because of the cost of professional liability insurance. Larger proportions (32 percent and 29 percent, respectively) reported that they would likely do so. Forty-two percent of the specialists reported that they had already restricted their scope of practice, and 50 percent said they were likely to (continue to) do so over the next two years.

This survey had a response rate of 65 percent, but may still have suffered from bias due to physicians' desire to give a socially correct response. Additionally, the sampling scheme was designed to produce a representative sample of physicians at highest malpractice risk, but is not generalizable to all specialties. Similarly, Pennsylvania is broadly representative of other states experiencing a malpractice crisis, but findings from Pennsylvania cannot be generalized to the national level.

Few studies have directly examined whether access to high-risk services has been affected; the evidence base is not yet sufficient to answer this question.

Direct evidence of effects on access to care would consist of data showing that measures of patient access, such as travel times and wait times for specialist services, have worsened in states affected by rising liability costs, and that this trend is unrelated to other things going on in those states. Evidence of changes in the supply of physicians constitutes only indirect evidence of an access-to-care problem, because it is possible that the baseline supply of providers was sufficiently large that patients still have good access to care even after some physicians leave practice.

In at least one survey study (30), physicians have reported that their patients have experienced increased travel times and wait times for specialist care. Such problems reportedly resulted both from malpractice pressure and from other factors, such as managed care restrictions. Other research evidence does not indicate that significant reductions in access to care have occurred. Two studies have examined whether rates of utilization or provision of high-risk procedures are lower in states with heated liability environments than in other states. One, an uncontrolled, descriptive analysis, found that the number of doctors performing craniotomies, cesarean sections and vaginal deliveries with complications in Florida, a state severely affected by rising insurance costs, decreased during the period of the latest malpractice crisis compared to 1997–2000. Rates of these

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procedures and access to care (travel times), however, were largely unaffected (11). This study did not control for other factors that may have influenced the supply of doctors performing these services in Florida over the study period.

The other, a well-designed study that controlled for a range of factors that may affect health services utilization, examined whether rates of several procedures varied across states according to either malpractice insurance premiums or payments made in malpractice cases (2). The authors found no significant differences in rates of percutaneous coronary interventions, angiography, coronary artery bypass graft, cesarean section, transurethral prostatectomy, or radical prostatectomy. Mammography rates were higher in the states with higher premiums and payments. An important limitation of this study is that the procedure rates were for Medicare patients only. Doctors might be more inclined to avoid high-risk procedures for younger patients because they are statistically more likely to sue than elderly patients (6).

Longer-term effects on physician supply may occur that have not been documented.

The studies discussed focus on short-term effects of changes in the malpractice environment on physician supply. There may also be longer-term effects. For example, deteriorations in the liability environment may dissuade college students from entering medical school, medical students from entering certain specialties, or medical residents from setting up their first practice in a state with high malpractice insurance premiums.

One survey study suggests that residents who trained in Pennsylvania during the malpractice crisis were much less likely to stay in the state after residency than residents who trained there when the liability climate was calmer (29). In a state that is undersupplied with young physicians to begin with, the exit of newly qualified physicians could pose a long-term problem. There is no evidence that interest in particular specialties is correlated with perceived malpractice risk. Rather, medical students tend to choose their specialty based on a host of factors, including income and lifestyle (16, 31).

“Defensive medicine” is difficult to measure, but is likely to become more prevalent when physicians perceive heightened malpractice risk.³ Pinning down the extent, costs and consequences of defensive medicine is notoriously difficult. In addition to the problem of trying to extrapolate national, systemwide costs on the basis of measurements drawn from a limited set of procedures, it is difficult to ascertain which procedures, tests, and referrals (called “assurance behaviors”) are ordered primarily out of legal concerns rather than medical judgment (5, 41). Physicians may have more than one reason for ordering a test, and it can be difficult to draw a clear line between the desire to avoid lawsuits and the desire to make absolutely sure that the patient receives an accurate diagnosis and all treatment that might benefit him (see Appendix II for further discussion of this issue).

One strong methodology for measuring defensive medicine is to compare rates of medical procedures that physicians might be inclined to order out of legal fear, such as magnetic resonance imaging and cesarean section, across geographic areas with different liability climates, controlling for other factors that might account for the differences in utilization of these procedures. Three well-designed studies have found that greater malpractice risk (measured by premiums or claims

³ Defensive medicine can take two forms. What is conventionally described as defensive medicine are “assurance behaviors,” in which physicians order tests, referrals, and procedures that are not medically justified primarily for the purpose of reducing legal risk. But the “avoidance behaviors” discussed earlier in the Synthesis – withdrawing from practice or restricting scope of practice to exclude high-risk patients or procedures – could also be considered forms of defensive medicine. This section of the Synthesis focuses on assurance behaviors.

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frequency in the area) was associated with small but statistically significant increases in the incidence of cesarean sections (12, 26, 44). Other studies have had mixed results, with some providing corroborating evidence (18, 19, 36) and others finding no difference in cesarean rates (3, 37).

Although the methodological challenges probably mean that there will never be a completely accurate estimate of the extent of defensive medicine, studies consistently find that assurance behaviors are widespread and become even more so during malpractice crises (21, 41, 45).

Two relatively recent, well-designed studies provide illustrative data. A 2003 survey of high-risk specialists in Pennsylvania found that 93 percent reported that they sometimes or often engaged in at least one of six assurance behaviors (41). Fifty-nine percent reported often ordering more diagnostic tests than were medically indicated; 52 percent often made unnecessary referrals to specialists; 33 percent prescribed more medications than were medically indicated; and 32 percent suggested unnecessary invasive procedures such as biopsies to confirm diagnoses. Physicians who were not confident about the adequacy of their liability coverage and physicians who perceived their insurance premiums to be very burdensome were significantly more likely to report these behaviors.

One often-cited study used Medicare claims data and strong statistical methods to examine whether patients in states without strong tort reforms received more health care services than patients with the same diagnoses in states that had such reforms (21). It found that states that adopted “direct” tort reforms such as caps on damages experienced five percent slower growth in expenditures for patients admitted to the hospital for myocardial infarction, and nine percent slower growth in spending on patients with ischemic heart disease, between 1984 and 1990. This study has been somewhat controversial because the authors attempted to extrapolate national defensive-medicine costs from these two diagnoses (46) and a subsequent study failed to replicate the findings for other diagnoses (7). The study’s findings are probably not generalizable to all conditions or all patients, but its estimates for these two common conditions are quite defensible. Unlike the survey study discussed above, this study did not attempt to ascertain whether the extra costs generated in high-liability states were associated with care that the treating physicians found necessary and beneficial or care that was ordered primarily for defensive purposes.

What has been the impact of state tort reforms on premiums, claims frequency, claims payouts and physician supply?

In response to the last three malpractice crises, states have implemented a limited range of tort reforms. The objective of conventional tort reforms (Figure 2) is to reduce the overall costs of malpractice litigation. The specific mechanisms for achieving this goal are: (1) erecting barriers to bringing suit (statutes of limitation/repose; attorney contingency-fee reform) or reaching trial (pretrial screening panels); (2) limiting the amount plaintiffs may take as an award (caps on damages, collateral-source rule reform); and (3) altering the way damages awards are paid (joint-and-several liability reform, periodic payment).

Findings

Figure 2. Tort reforms commonly adopted by states

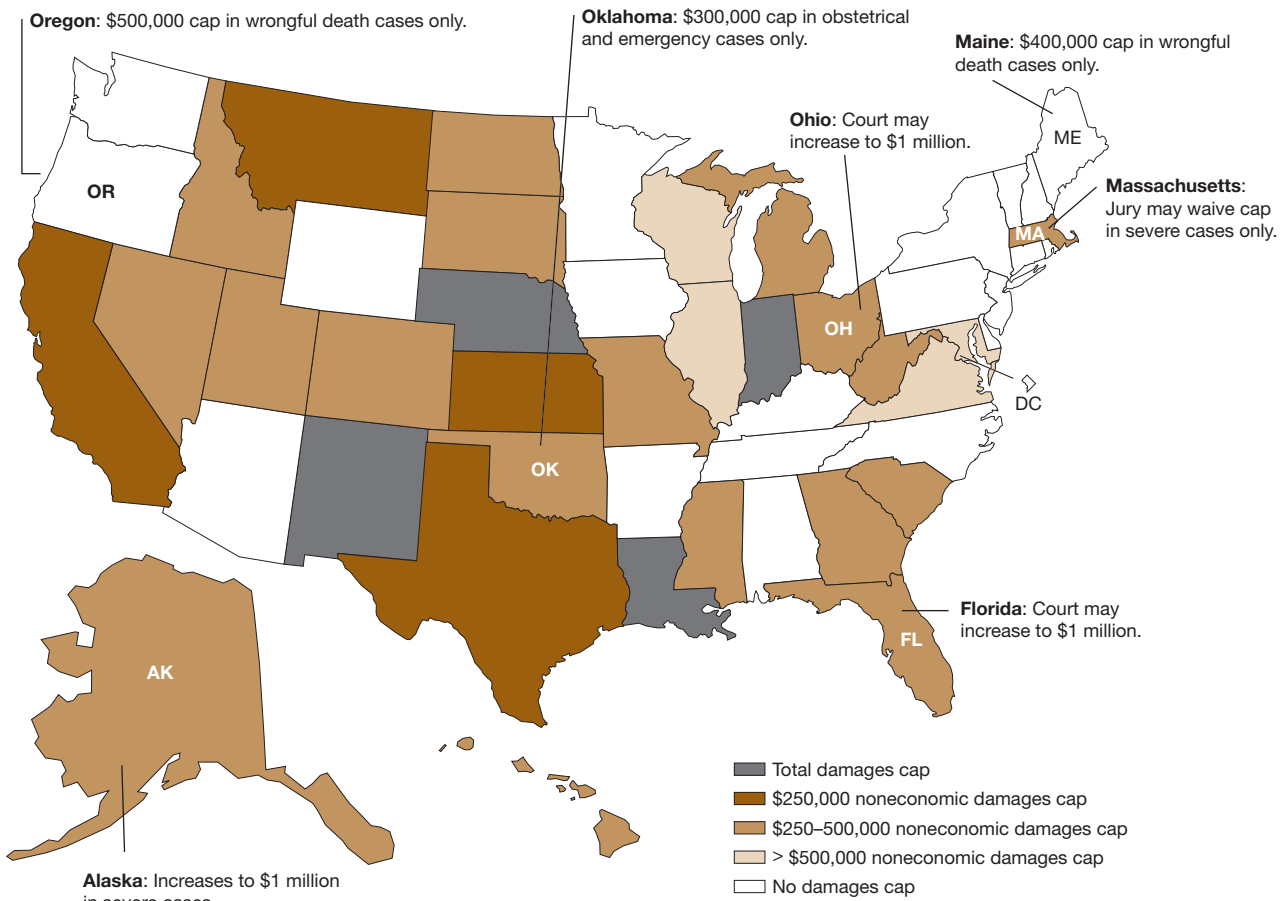
Reform	Description
Caps on damages	Caps on damages limit the amount of money that a plaintiff can take as an award in a malpractice suit. The cap may apply to noneconomic damages (“pain and suffering”), total damages (including both noneconomic damages and economic loss such as medical expenses and lost wages), or only punitive damages (damages intended to punish the defendant for particularly wanton conduct; very rare in malpractice cases). The cap may apply to the plaintiff, limiting the amount she may receive, or to each defendant, limiting the total amount for which each may be liable.
Joint-and-several liability reform	In cases involving more than one defendant, such as a physician and a hospital, this reform limits the financial liability of each defendant to the percentage fault that the jury allocates to that defendant. Without this reform, the plaintiff may collect the entire amount of the judgment from one defendant if the other(s) default on their obligation to pay, even if the paying defendant bore only a small share of the responsibility for what happened to the plaintiff.
Statutes of limitations/statutes of repose	These reforms limit the amount of time a patient has to file a malpractice claim, typically to two or three years. Statutes of limitations bar suits unless they are filed within a specified time after the injury occurs or is discovered. Statutes of repose bar suits unless they are filed within a specified time after the medical encounter occurred, regardless of whether an injury has yet been discovered.
Attorney contingency-fee reform	This reform limits the amount of a malpractice award that a plaintiff’s attorney may take in a contingent-fee arrangement. The limitation is typically expressed as a percentage of the award; it may also incorporate a maximum dollar value.
Collateral-source rule reform	This reform eliminates a traditional rule that if an injured plaintiff receives compensation for her injury from other sources, such as health insurance, that payment should not be deducted from the amount that a defendant who is found liable for that injury must pay.
Pretrial screening panels	Pretrial screening panels review a malpractice case at an early stage and provide an opinion about whether a claim has sufficient merit to proceed to trial. Typically, a negative opinion does not bar a case from going forward, but can be introduced by the defendant as evidence at the trial.
Periodic payment	This reform allows or requires insurers to pay out malpractice awards over a long period of time, rather than in a lump sum. This enables insurers to purchase annuities (sometimes called “structured settlements”) from other insurance companies which cost less than paying the whole award up front. Insurers are also able to retain any amounts that the plaintiff does not actually collect during her lifespan.

Tort reform has been on the legislative agenda in nearly all states that are experiencing volatility in their liability insurance market. With few exceptions, the reforms that states have adopted (as well as the reforms currently under consideration in the Congress) have reprised approaches taken to the crisis of the mid-1980s and have been limited in their aims and scope. Some states that did not pass tort reforms in the 1980s have recently done so; others have added to or strengthened reforms passed earlier.

Caps on damages have received the greatest attention by far. Twenty-six states now have some type of limitation on damages, mostly applying to the noneconomic component of awards (Figure 3).

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Figure 3. Caps on noneconomic and total damages by state as of April 2006



Source: Author's analysis

Studies of the effects of these reforms tend to burgeon around times of malpractice crisis. There is a cluster of studies from the mid-1980s crisis and its aftermath and an emerging literature from the current crisis period. Most of the older studies are methodologically strong (they use strong econometric methods to analyze the effect of caps while controlling for important confounding variables). Their results have continued relevance, although the market and legal environments have changed somewhat over time. Most of the evidence concerning reforms other than caps on damages comes from these earlier studies. The newer studies vary in quality, but some valuable contributions to the literature have appeared over the last two years. The newer studies have focused primarily on evaluating caps on damages, because of the political interest in that reform.

Findings

Aside from caps on damages, most of these reforms have had limited efficacy

(Figure 4). Two other reforms have had some effect. Joint-and-several liability reform has been found to constrain the growth of insurance premiums (but has no significant effect on claims payouts or physician supply). Study findings regarding shorter statutes of limitations/repose are mixed, but some strong studies have found an effect on claims frequency and premiums (effects on physician supply have not been tested, and there was no effect on claims payouts).

Attorney contingency-fee limits, despite their political appeal, have not been shown to have significant effects in the majority of studies. Collateral-source offsets, pretrial screening panels and periodic payment too, have rarely been found to have any significant effects. The continued interest in these reforms is striking given the lack of evidence of their effectiveness. (For information on the methodological strengths and weaknesses of relevant studies, see Appendix III.)

As shown in Figure 4, the size of the evidence base concerning the efficacy of reforms varies across reforms. Some reforms have been extensively tested against each of the outcomes of interest (premiums, physician supply, claims payouts, and claim frequency). The effect of other reforms on some of the outcomes has not yet been tested. For example, no studies have examined whether joint-and-several liability reform affects claims frequency.

The efficacy of caps on damages has been hotly disputed, and much of the evidence used in the policy debate is not based on rigorous analysis. Several methodological limitations should be considered when assessing the impact of caps, particularly their effects on insurance premiums.⁴ (These issues are discussed in greater detail in Appendix II):

- Simple descriptive studies are much more prevalent than controlled studies.
- Comparison groups are sometimes constructed inappropriately. For example, states with recently adopted caps may be compared to a group that includes both states with older caps and states with no caps.
- Analyses may group states with different types of caps together, making it difficult to determine which type is causing observed effects.
- Information on trends in premiums or claims payouts may be presented without adjusting for the number of physicians in the population.
- Statistics on “average premiums” in a state may present a simple average rather than a weighted average incorporating market-share information.
- Data on trends in premiums, insurer losses, or award average size may not be adjusted for inflation.

Evidence about the impact of caps on average awards, claims frequency, insurance premiums, or physician supply that derives from simple state-to-state comparisons is not reliable. Inferences about the effects of caps should be drawn only on the basis of findings from well-designed, controlled studies. Fortunately, there are several such studies (see Appendix III). Their findings have varied, however.

⁴ A more detailed explanation of these methodological problems can be found in Michelle M. Mello and David M. Studdert, *Understanding Medical Malpractice Damages Caps*, working paper 2006.

Findings

Figure 4. Results of controlled studies of the impact of tort reforms[†]

	Significant decrease in claims payouts?	Significant decrease in claims frequency?	Significantly lower liability insurance premiums?	Significant increase in physician supply?
Damages cap[‡]	YES: <i>Danzon 1984 (8)</i> <i>Danzon 1986 (9)</i> <i>Sloan et al. 1989 (39)</i> Blackmon & Zeckhauser 1991(4)* Viscusi & Born 2005 (49)* NO: <i>Zuckerman et al. 1990 (52)</i> Viscusi et al. 1993 (50)*	YES: No studies NO: <i>Zuckerman et al. 1990 (52)</i>	YES: <i>Zuckerman et al. 1990 (52)</i> Danzon et al. 2004 (10) <i>Thorpe 2004 (43)</i> Viscusi & Born 2005 (49) NO: Sloan 1985 (38) <i>Zuckerman et al. 1990 (52)</i> Blackmon & Zeckhauser 1991 (4) [†] Viscusi et al. 1993 (50)	YES: Klick & Stratmann 2003 (24) [†] Encinosa & Hellinger 2005 (13) [†] Hellinger & Encinosa 2003 (20) NO: <i>Matsa 2005 (27)</i>
Joint-and-several liability reform	YES: No studies NO: Blackmon & Zeckhauser 1991 (4) [†] Viscusi et al. 1993 (50)*	No studies.	YES: Blackmon & Zeckhauser 1991 (4) Viscusi et al. 1993 (50) [†] Danzon et al. 2004 (10) NO: <i>Thorpe 2004 (43)</i>	YES: No studies. NO: Klick & Stratmann 2003 (24)
Statutes of limitations/repose	YES: <i>Danzon 1984 (8)</i> NO: <i>Sloan et al. 1989 (39)</i> <i>Zuckerman et al. 1990 (52)</i> Blackmon & Zeckhauser 1991 (4) [†]	YES: <i>Danzon 1986 (9)</i> <i>Zuckerman et al. 1990 (52)</i> NO: <i>Danzon 1984 (8)</i>	YES: <i>Zuckerman et al. 1990 (52)</i> NO: Sloan 1985 (38) Blackmon & Zeckhauser 1991 (4)	No studies.
Attorney contingency-fee limit	YES: No studies. NO: <i>Danzon 1984 (8)</i> <i>Danzon 1986 (9)</i> <i>Sloan et al. 1989 (39)</i> <i>Zuckerman et al. 1990 (52)</i> Blackmon & Zeckhauser 1991 (4) [†]	YES: No studies. NO: <i>Zuckerman et al. 1990 (52)</i>	YES: No studies. NO: Sloan 1985 (38) <i>Zuckerman et al. 1990 (52)</i> Blackmon & Zeckhauser 1991 (4) <i>Thorpe 2004 (43)</i>	YES: No studies. NO: Klick & Stratmann 2003 (24)
Collateral-source offset[§]	YES: <i>Danzon 1984 (8)</i> <i>Danzon 1986 (9)</i> NO: <i>Sloan et al. 1989 (39)</i> <i>Zuckerman et al. 1990 (52)</i> Blackmon & Zeckhauser 1991 (4) [†]	YES: <i>Danzon 1986 (9)</i> NO: <i>Zuckerman et al. 1990 (52)</i>	YES: No studies. NO: Sloan 1985 (38) <i>Zuckerman et al. 1990 (52)</i> Blackmon & Zeckhauser 1991 (4) Danzon et al. 2004 (10) <i>Thorpe 2004 (43)</i>	YES: No studies. NO: Klick & Stratmann 2003 (24)
Pretrial screening panels	YES: No studies. NO: <i>Danzon 1984 (8)</i> <i>Danzon 1986 (9)</i> <i>Sloan et al. 1989 (39)</i> <i>Zuckerman et al. 1990 (52)</i>	YES: No studies. NO: <i>Danzon 1984 (8)</i> <i>Danzon 1986 (9)</i> <i>Zuckerman et al. 1990 (52)</i>	YES : Sloan 1985 (38) NO: <i>Zuckerman et al. 1990 (52)</i>	No studies.
Periodic payment	YES: No studies. NO: <i>Danzon 1984 (8)</i> <i>Sloan et al. 1989 (39)</i> Blackmon & Zeckhauser 1991 (4) [†]	YES: No studies. NO: <i>Danzon 1984 (8)</i>	YES: No studies. NO: Blackmon & Zeckhauser 1991 (4)	YES: No studies. NO: Klick & Stratmann 2003 (24)

[†] An earlier version of this table appeared in Studdert, 2004 (40). The 2005 study by Kessler et al. (23) is excluded because it grouped several reforms together, precluding the possibility of drawing inferences about the effects of particular reforms.

[‡] Studies used different definitions of cap variable. Studies are classified as having significant findings if any specification of a damages cap variable was statistically significant.

* Study modeled insurer losses rather than average award size. Losses are a function of both average award and number of paid claims.

[§] Some studies modeled mandatory and discretionary collateral offsets separately. Studies are classified as having significant findings if any specification of a collateral source offset variable was statistically significant.

[†] Study results were mixed.

The strongest studies are cited in bold print.

Findings

Good evidence shows that caps on damages reduce average award size by 20–30 percent, but there is no evidence that they decrease claims frequency. It is often argued that caps on damages will reduce claims frequency because claims with a lower potential value are less attractive to plaintiff’s attorneys working on a contingent-fee basis. Proponents of caps see this as a benefit of caps, in that total litigation costs will likely be lower if fewer claims are filed. Opponents of caps see it as a problem, because it suggests that plaintiffs with meritorious claims might not have access to the courts. One controlled study found that there was no significant difference in frequency of claiming associated with caps on damages (52). The evidence base on this issue, however, consisting of only that one study, is insufficient for broad generalizations.

On the other hand, many studies have found that caps have a significant effect on claims payouts. Some studies have found that caps reduce total claims payouts or insurer losses (4, 49, 50) (see Appendix III). In the absence of evidence that caps reduce claims frequency, a reasonable inference is that the reduction is driven by lower average awards. Overall, caps appear to be associated with a 23 percent to 31 percent reduction in average awards. That caps reduce average awards should be uncontroversial because the literal effect of caps is to reduce awards. Of note, most of the evidence on this point comes from relatively old studies. It is possible that analysis of more recent data might yield a smaller effect on payouts, because increases in the costs of medical care may have led to growth over time in the economic component of malpractice awards as a proportion of the total award.

It is important to bear in mind that caps only apply to jury verdicts, although they may have a “shadow” effect on settlements. Less than ten percent of malpractice cases go to trial (48), and only some of these will result in a noneconomic damages award large enough to trigger the cap. A study of jury verdicts subject to the \$250,000 cap in California found that 51 percent of the verdicts were reduced by the cap (42). An analysis of Missouri claims found that only six of 439 paid claims reached its cap, which was \$557,000 in that year (25). Thus, caps formally touch only a fraction of all claims. Nevertheless, the effect on total award costs may be significant because caps affect the most costly claims.

The best studies suggest that caps are associated with a small increase in physician supply. Proponents of caps argue that they help states attract and retain physicians by providing relatively good insulation from malpractice judgments. Although it is insurers, and not physicians, who are responsible for paying large judgments, physicians as a group may feel the financial consequences over time in the form of higher insurance premiums. Until quite recently, however, there were no controlled studies evaluating the impact of caps on damages on the supply of physicians in a state.

Five studies, only two of which have been published in peer-reviewed publications, have examined the relationship between caps and physician supply using statistical methods to control for other state and local characteristics that may influence how attractive a particular state is to physicians. Of these, two studies have found that states with caps experience significantly higher growth in physician supply over time (20, 23), one found no significant effect (27) and two produced mixed results (13, 24). Some of the studies are methodologically stronger than others, so all should not be relied upon equally. The study with the strongest methodology found that “direct reforms” such as caps on damages were associated with three percent higher growth in physician supply over three years (23). The major shortcoming of this study is that it cannot separate out the effect of caps on damages from other “direct reforms” such as collateral-source rule reform. Overall, a reasonable conclusion to draw from this group of studies is that caps appear to be associated with a small but statistically significant increase in physician supply.

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The most recent controlled studies show that caps moderately constrain the growth of premiums.

A number of descriptive analyses by interest groups have linked caps with lower premiums. However, most of these studies are not very informative, because they do not control for other state characteristics that affect premiums, and suffer from other methodological problems (see Appendices II and III). Studies from earlier malpractice crises suggest that caps on noneconomic damages did not reduce malpractice premiums in the 1970s and 1980s. Four studies are available from that era; three had no significant findings (38, 50, 52) and the fourth had mixed findings (it also lumped caps on noneconomic damages together with caps on total damages and caps on punitive damages) (4).

In contrast, studies based on data from the 1990s and the early years of the current malpractice crisis consistently found that caps had a modest but statistically significant constraining effect on premiums during this period; the effect is on the order of a 6–13 percent reduction in the rate of growth (10, 22, 43, 49). It is not clear why study findings have differed across time periods. The more recent studies are the most useful because they best represent today's market conditions. Although they are not without limitations, most of these studies are of good quality and their overall findings can be considered reliable. Specific methodological strengths and limitations are described in Appendix III.

A few caveats are in order. First, most of the existing studies do not control very well for differences in the extent of regulation of insurance premium rates across states, which could be influential. The respective roles of rate regulation and caps on damages in constraining premium growth has been controversial, particularly in understanding the experience of California, which adopted both types of reforms (see Appendix IV).

Second, most of the studies do not indicate what level of noneconomic damages cap has the largest effect on premiums or claims; they tend to lump different levels of caps together. Third, caps on damages do not reduce premiums in absolute terms. Premiums have been rising over time (even after adjustment for inflation) even in states with caps; it is just that they have been rising more slowly in those states.

Finally, the effect of caps on premiums does not happen immediately. The studies indicate that some effects are typically experienced within a year, but the full effect does not manifest itself for three years. In summary, good evidence suggests that caps will have modest effects on the growth of insurance premiums over time; however, they will not prevent premium growth and they will not have large or immediate effects.

Caps on noneconomic damages have disadvantages relating to patient safety and equity in the medical liability system.

When evaluating caps on damages as a policy solution, their impact on insurance costs is an important consideration, but so are two other considerations: deterrence and fairness. Opponents of caps are concerned that limiting liability will negatively affect patient safety because they will undermine the incentives for “deterrence”—that is, not practicing in a negligent manner. Some legal scholars respond by noting that there is very little evidence that the current medical liability system has much of a deterrent effect. It is probably the case that whatever modest deterrent effect does exist, however, is diminished by reforms, such as caps on damages, that make lawsuits less consequential for health care providers and insurers. The

Findings

more general argument that caps do not address the problem of patient safety in the health care system is compelling. The aim of caps is simply to limit liability; caps are not meant to reduce the incidence of medical error and adverse events, and there is no reason to think they do so.

Another objection that is often raised to caps on noneconomic damages is that they are unfair. The argument asserts that caps disproportionately affect plaintiffs who are severely injured, elderly, or female. Elderly and female plaintiffs may be especially burdened by caps, according to this argument, because they are relatively low wage-earners; therefore, the noneconomic component of their award tends to be proportionately larger than that of younger and male plaintiffs. Evidence from studies of jury verdicts that were subject to California's \$250,000 cap on noneconomic damages shows that caps do indeed exacerbate existing inequities in compensation for medical injuries by disproportionately affecting the most severely injured plaintiffs (35, 42). The evidence that they disproportionately burden women or the elderly, however, is very limited (15, 35, 42).

In this malpractice crisis, a number of groups have expressed interest in alternative approaches to reform. The conventional reforms discussed so far, including caps on damages, have a limited goal: to reduce litigation costs, and thereby reduce malpractice insurance premiums. In a malpractice crisis, these are important goals. Many groups, however, have called for policy-makers to consider more far-reaching reforms that would address other, more enduring problems with the medical liability system including its inefficiency, low rate of compensating injured patients, inequity in awarding compensation and lack of deterrence of medical errors.

Among the major alternative reform approaches now receiving attention are the following:

- *Schedules of Damages:* Some groups are considering whether it is possible to reap the advantages of caps on damages while avoiding the associated political difficulties and equity concerns by adopting a schedule of noneconomic damages. Schedules differ from flat caps in that they classify injuries into different severity tiers and then attach a range of dollar values to each tier, rather than imposing a single ceiling on pain-and-suffering awards. Juries are presented with the schedule and advised to use it as a guideline in reaching a decision about a noneconomic damages award. Because they would reduce insurers' uncertainty, particularly around very large judgments, damages schedules could help control the growth of insurance premiums. They also would help ensure that plaintiffs with similar injuries received similar noneconomic damages awards and that the size of the award increased with the severity of injury. To some, a significant disadvantage of damages schedules is that they limit the discretion of the jury in making decisions about compensation. They also may be less effective at cost control than a low-value flat cap.
- *Patient safety improvement:* Consumer groups and trial lawyers argue that the best way to reduce malpractice litigation costs is to reduce malpractice. If fewer medical errors were committed, they argue, there would be less litigation. They advocate implementation of clinical interventions that have been shown to be effective in reducing rates of adverse events—for example, the increased use of computerized physician order entry systems. The advantage of this approach is that, if successful, it would have the important dual benefit of providing relief to health care providers and improving the health and safety of patients. The problem is that epidemiological studies of medical injury show that there is a very poor correspondence between adverse events and malpractice claims. That is, most negligent medical injuries don't result in claims, and many injuries that aren't actually due to negligence do result in claims. As a result, even large decreases in rates of medical injuries should not be expected to decrease claims rates by very much (28).

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- *Disclosure and “early offer” programs:* Studies suggest that two of the major reasons why people file malpractice suits are that they need compensation for their economic losses, such as lost wages, and that they are angry because they feel their doctor or hospital did not address their injury in a candid and compassionate way. Some reformers argue that these factors could be addressed by prompt and candid disclosure of adverse events accompanied by offers of reasonable compensation for economic losses. “Early offer” proposals typically specify that providers offer full compensation for past and future economic losses in exchange for the patient agreeing not to seek additional compensation for pain and suffering in a lawsuit. These proposals represent a promising avenue for resolving claims more quickly and at lower cost, particularly claims that are relatively straightforward. They could have the added benefit of preserving goodwill between the doctor, hospital and patient. Some lawyers object to such proposals because they fear that patients will be discouraged or barred from filing suit before they have had a chance to receive advice from a lawyer, who might explain that what is being offered by way of compensation is inadequate. They also object to the exclusion, in many proposals, of any compensation for noneconomic losses.
- *Demonstration projects of administrative compensation:* A number of groups are considering experimentation with pilot programs of administrative compensation, sometimes called “health courts.” This model removes the adjudication of medical malpractice claims from courts and sets up an administrative process to evaluate claims instead.⁵ The decision-making panel could be based at a hospital system, a liability insurer, or a state government agency. The panel would award compensation not just to patients injured by negligence, but to all patients whose injuries could have been avoided (a group that is larger than the group of injuries due to deviations from the standard of care). The panel would use decision guidelines to fast-track certain kinds of injuries for quick decisions based on the best available scientific evidence about their avoidability. These proposals show promise because they are simpler and more equitable but they are a tough sell politically in many jurisdictions. Administrative processes would be much more efficient than judicial decision-making, in part because neutral medical experts would replace costly battles between experts hired by the parties. Greater efficiency could result in considerable cost savings. Because a larger group of patients would be compensated under the expanded liability standard, however, the total costs of the system might not be lower.

⁵ Administrative compensation proposals are different from arbitration programs. Arbitration uses the same compensation standard and similar procedures to the ordinary judicial process, but a different adjudicator. Administrative compensation involves not only a different adjudicator but also a different compensation standard and claiming process.

Implications for Policy-Makers

This Synthesis Report gives rise to a number of conclusions and policy implications.

First, **malpractice crises are likely to recur.** The U.S. has experienced three malpractice crises in the last thirty years, and none of the contributing conditions have changed or are likely to change. Thus, even though the malpractice insurance environment appears to be stabilizing in some states, it remains important and timely to consider appropriate policy responses to malpractice crises.

Second, **malpractice crises affect the supply and delivery of health care services, though the magnitude of the effect is sometimes overstated and difficult to measure.** Some of the claims that have been made about the effects of rising insurance costs during this malpractice crisis on patient care are probably exaggerated, but there is a modest effect on the supply of physicians. Malpractice crises also appear to be associated with heightened defensive-medicine behavior.

Third, **no single policy solution will address all of the factors that lead to malpractice crises.** The current malpractice crisis has multifaceted origins (which are discussed in more detail in the Primer in this series). Increased claims costs, imprudent insurer business decisions, decreased insurer investment returns, and other dynamics of the “insurance cycle” have all been contributing factors. Most policy strategies to address the crisis, such as caps on damages, have limited aims and impacts. They may be fairly effective at addressing one of the drivers, but not all of them. Some of the drivers, such as the insurance cycle, are temporary and essentially self-correcting. Policy-makers may prefer to let the market correct itself rather than intervene with tort reforms or insurance regulation. This strategy means that there will be good times and bad in the professional liability insurance market. Relying on the market would not necessarily preclude assistance for health care providers, such as premium subsidies or reimbursement increases, during periods of rapidly rising premiums.

Fourth, **caps on damages help constrain growth in litigation costs and insurance premiums over time, but disproportionately burden the most severely injured patients.** There is good evidence that caps reduce average award size and moderately constrain the growth of premiums. Most of their effect on premiums is seen over the medium term, not immediately. Caps have a small, albeit statistically significant, effect on physician supply. Fairness objections to caps on damages should be taken seriously, however. The evidence shows that rather than discouraging “frivolous” litigation, they disproportionately burden the most severely injured patients. There are probably less onerous ways to bring greater predictability and cost control to the liability system, such as damages schedules and programs that encourage early settlement.

Finally, **malpractice crises bring new attention to some of the fundamental problems with the medical liability system, which require more sweeping reform.** A compelling body of evidence establishes that the liability system performs poorly as a mechanism for directing compensation to injured patients in a thorough and equitable fashion, deterring medical error, and fostering an environment that supports patient safety initiatives such as adverse event reporting. Although they present more political challenges, reform proposals such as early-offer programs and health courts merit serious consideration and objective assessment.

The Need for Additional Information

Efforts should be made to improve the availability and quality of state data on claims and premiums. Efforts to evaluate the causes and consequences of the malpractice crisis have been frustrated by a lack of comprehensive, accessible data on malpractice claims and insurance premiums. This flows in part from the fact that malpractice law and insurance are matters of state law: there are few national databases and reporting requirements. Even within states, there is typically no systematic aggregation of data from individual trial courts, and departments of insurance vary in what they collect from individual insurance companies.

A recent report by the National Association of Insurance Commissioners recommended that state insurance regulators begin collecting comprehensive data on frequency of claims and average awards and major claim types represented, and maintain these data in a way that is useful for research purposes (32). Also needed are data on specialty-specific premium rates. Insurance commissioners are well situated to implement such reporting requirements, and the National Association of Insurance Commissioners could serve as a vehicle for standardizing reporting across states and combining reports into a multi-state database that could be made available, in de-identified form, to researchers.

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Methodological approach

The methodological approach for this synthesis was guided by its objective of educating policy-makers about the differences between reliable and unreliable evidence concerning the causes and consequences of the malpractice crisis and potential solutions. We reviewed both high-quality studies and evidence of lesser quality; evaluated and distinguished them using accepted criteria of scientific rigor; and formulated our conclusions based on the best available evidence.

The criteria of scientific rigor that we applied included:

- Use of a data source that was sufficiently comprehensive to support the planned analyses
- Low potential for measurement error, nonrepresentativeness and other forms of bias in the data used
- Appropriateness of the analytical method chosen
- Adequacy of control for potentially confounding variables
- Adequacy of the sample size
- Appropriateness of the interpretation of data and conclusions drawn.

We comprehensively reviewed studies published in the academic literature, identifying candidate studies by searching PubMed, Westlaw, EconLit and online resources such as the Social Science Research Network and the National Bureau of Economic Research. We also identified studies by reviewing the lists of references cited in publications culled from those sources. We limited our review to studies from the mid-1980s forward.

Because the “grey literature”—unpublished reports and position papers—on the malpractice crisis is voluminous, our review is limited to analyses that have featured prominently in the policy debate at the national level. Our review included reports issued by or promoted or disseminated by the following influential organizations: the U.S. General Accountability Office, the Congressional Budget Office, the Office of the Assistant Secretary for Planning and Evaluation (U.S. Department of Health and Human Services), the American Medical Association, the American Trial Lawyers Association, the American Bar Association, Weiss Ratings, Inc., Tillinghast Towers-Perrin, Americans for Insurance Reform, the Center for Justice and Democracy, Public Citizen, the Foundation for Taxpayer and Consumer Rights, Milliman USA, Brown Brothers Harriman, the National Association of Insurance Commissioners, the Kaiser Family Foundation and the Physician Insurers Association of America.

Where the findings of well-designed studies conflicted with the findings of weaker studies, we aimed to explain why the findings of the weaker studies were less reliable. Where the findings of well-designed studies conflicted with one another, we identified methodological choices and issues (if any) that may explain the disparities. Where there was no scientific reason to place more credence in one set of findings than another, we characterized the state of knowledge about that point as one of ongoing uncertainty. In formulating conclusions that specifically relate to the current malpractice crisis, we placed more weight on evidence from recent studies than on studies from previous malpractice crises, since conditions in the insurance and health care markets may have changed over time.

Issues in measuring effects of malpractice environment on the supply of physician services

Claims about retirements, relocations, and restrictions on scope of practice could be investigated through several approaches, but each is problematic. First, physician self-reports can be collected. Several medical societies in crisis states, for example, have asked physicians to report their personal stories of having to leave or alter their medical practice. This sometimes produces large counts of affected physicians, but there is no way to know what percentage of affected physicians has offered their stories, how representative those stories are of physicians' experiences generally, or whether reporting physicians are providing all the relevant information.

Using an alternative approach, several medical societies and independent research studies have conducted physician surveys. One difficulty with these surveys, particularly those done by medical societies, is that they tend to have low response rates, in part because busy physicians are often reluctant to participate. Surveys with low response rates (under 60 percent) should be interpreted with caution; response rates of less than 45–50 percent should trigger great caution, particularly if the survey does not provide information on whether the people who responded differ significantly on some important characteristic from those who did not respond.

Surveys with higher response rates are more likely to provide representative data, but they still suffer from a potential response-bias problem. Physicians have a strong incentive to report that their increased insurance costs are affecting their ability to offer health services, because this builds the case for policy interventions. Many physician organizations have lobbied hard for reforms such as caps on damages, and individual physicians may feel a need to buttress their efforts. This may lead them to consciously or unconsciously exaggerate their responses. As well, surveys that elicit information on decisions that physicians plan to carry out in the future may not capture what physicians actually end up doing. Physicians may change their mind about retiring, for example, or may find it is impossible to establish a practice in another state. Thus, survey reports may tend to overestimate the effects of a malpractice crisis on the supply of physician services in a state.

An alternative methodology is to count physicians using datasets such as state licensure rolls or the American Medical Association Physician Masterfile, which compiles information on practicing physicians based on surveys and other data sources. Such datasets, however, have shortcomings. Licensure lists may not distinguish between physicians who are actively practicing full time and physicians who are inactive or who spend a large portion of their time on nonclinical activities. The Physician Masterfile is subject to reporting lags and is known to produce overestimates of physician supply and to have poor sensitivity in detecting physician retirements and relocations. Neither type of dataset captures shifts in the scope of practice within a clinical specialty.

This type of analysis also cannot provide information on the reasons physicians choose to retire, relocate, or stop offering some kinds of service. Similarly, simply counting the number of hospitals in crisis states that have stopped providing certain services may wrongly attribute some decisions to malpractice concerns. A 2003 investigation by the U.S. General Accounting Office of several reports of hospital service closures found support for some claims that these decisions were made because of liability costs, but found that there were other reasons that some of the facilities had closed (47). Overall, datasets on the number of providers could produce either an overestimate or an underestimate of the supply of services, and cannot causally link changes in the supply of services to malpractice insurance issues.

Finally, understanding the effects of a malpractice crisis on access to care is challenging because just knowing how many physicians stopped practicing in the state is not enough; one must also know something about how well-supplied the area was to begin with, and what the demand for services is. Even areas that lose a lot of physicians may not experience access-to-care problems if they were initially oversupplied. On the other hand, rural and other underserved areas may suffer greatly from the loss of even a single neurosurgeon.

Issues in measuring defensive medicine

Defensive medicine is often measured using physician surveys. Physicians may be asked general questions about the frequency of different behaviors, such as ordering unnecessary biopsies. Alternatively, they may be presented with hypothetical clinical scenarios and asked to say what they would do. General questions may be particularly susceptible to physicians' desire to give socially correct responses. Scenarios may elicit more concrete and genuine responses, but cannot easily elicit physicians' reasons for choosing different courses of action.

Studies comparing inter-state variation in rates of particular procedures that physicians might be inclined to order defensively can be powerful. However, because there are many factors that give rise to variation in the way medicine is practiced across geographic areas, it is critical that such studies adequately control for other state and local characteristics before inferring that variations are attributable to differences in the litigation and insurance environments.

Issues in measuring the effects of caps on damages

Simple descriptive studies purporting to establish the effects of caps on damages are much more prevalent than controlled studies. Descriptive data are problematic because there are many aspects of the legal, political, economic and insurance-market environments of states that affect claims frequency and award size, insurance premiums and physician supply. Comparisons of trends in litigation, premiums, or physician supply in different states are only valid if the states are similar in terms of other factors that are believed to affect these variables. The two major approaches taken to control for state characteristics are (1) to include variables representing each characteristic in the regression model; and (2) to use a model estimation method, such as difference-in-difference analysis, that implicitly controls for state characteristics by examining only the magnitude of change in the outcome variable for each state over time. Both are appropriate if done correctly.

Comparison groups may be inappropriate for the analysis. For example, one recent interest-group press release presented a bar chart comparing the average amount by which insurance premiums increased in 2003–2004 in “states recently passing damage caps” compared to “states without new damage caps” (1). It concluded that caps do not restrain premium growth because the average increase was much higher in the states that had recently adopted caps. But the comparison group evidently included both states without caps and states with older caps. The appropriate comparison would be to states without caps only—and then only after controlling for ways in which the capped and uncapped states differed.

Different kinds of caps may be lumped together in the analysis, making it difficult to determine which type is driving observed effects. In academic studies, different kinds of caps on noneconomic damages (for example, \$250,000 flat caps and higher, inflation-adjusted caps) are often not distinguished in the analysis. In the grey literature, the blurring can be even worse: for example, in one widely cited report, the analysts grouped states with caps on

noneconomic damages together with states that capped total damages (34). A cap on total damages is a far more stringent type of cap, one not under serious consideration by any legislature today. The same report also failed to include one state that did have a noneconomic damages cap. The report concluded that states with caps had much more favorable insurer loss ratios than in the other states, but when the correct states are included in each group, the difference is much smaller.

Information on trends in premiums or claims payouts may be presented without adjusting for the number of physicians in the population. For example, one widely publicized graph compared “Premium Growth” in California versus the U.S. in general over the 1976-2000 period with no indication that what was actually reported was not per-capita physician premiums, but rather the total amount that insurers in California and the entire U.S. collected in physician premiums (33). Total premiums reflect not only the price of insurance but also the quantity of policies sold. We cannot tell if an increase in total premiums means that doctors are paying more for their insurance, or if the insurer is just selling more policies. If the number of physicians paying premiums in California changed at a different rate over time than the number of physicians paying premiums nationwide, the trendlines on this chart would give rise to a wrong inference about what physicians in different locations were paying. When the data underlying this graph are adjusted for the number of physicians, it becomes clear that: (1) the absolute difference between what a physician pays for insurance in California and what he pays elsewhere, on average, is not as large as a viewer of the graph would think; it’s just a few hundred dollars; and (2) California did not do much better than the U.S. average over the study period, with the notable exception of the years running up to the current tort crisis (1998–2000).

Statistics on “average premiums” in a state are often based on a questionable use of company-specific premium data. The most widely cited source of premium data is the annual insurer survey conducted by the insurance industry newsletter The Medical Liability Monitor. This survey collects and reports company-specific premiums for three medical specialties for different regions of the state. The survey is a valuable data source, but it is not meant to support estimates of statewide average premiums, in part because not all companies participate in the survey. But a bigger issue is that most analyses compute a simple average premium for all the companies in the state without adjusting for the fact that the companies may have very different market shares. Computing a simple average, rather than a weighted average, treats the companies as though they have identical shares of the market. Adjusting for market share and also for the number of physicians insured in each region of the state can make a big difference in the estimate of statewide average premiums: for Kentucky in 2002, for example, the simple average premium for obstetrician-gynecologists was \$58,287 but the weighted average premium was 19 percent less (\$48,897) (51).

Data on trends in premiums, insurer losses, or average award size over time may not be adjusted for inflation. This leads to artificially steep trendlines, suggesting that increases in costs are larger than they were in real terms.

Appendix III Summary of Studies on Impact of Caps on Noneconomic Damages[†]

Authors	Data Years	Findings	Methodological comments
Sloan et al. 1985 (38)	1974–1978	<i>Not significant.</i> Neither a cap on provider's liability nor a cap on plaintiff's recovery reduced premiums significantly.	Fairly strong analysis overall. <i>Strengths:</i> Uses per-capita premium data, rather than total premiums collected (which does not control for the number of physicians paying those premiums). Separately tests different kinds of caps. <i>Limitations:</i> Examines only short-term effect of caps passed in mid-1970s. Groups all types of caps together.
Danzon 1986 (9)	1975–1984	<i>Significant:</i> Having any kind of damages cap reduced the average award size by 23 percent.	Strong analysis overall. <i>Strengths:</i> Controls for six other tort reforms and many other factors that may affect average award size. <i>Limitations:</i> Data drawn from only eight insurers—may not be representative. Groups all types of caps together. Cannot examine long-term (post-1984) effect of caps.
Sloan et al. 1989 (39)	1975–1978, 1984	<i>Significant.</i> Average award size was 31 percent lower in states with caps on noneconomic damages than in uncapped states.	Strong analysis overall. <i>Strengths:</i> Controls for 19 other tort reforms. Separately tests different kinds of caps. <i>Limitations:</i> Potentially inadequate control for plaintiff characteristics that determine size of economic damages awards.
Zuckerman et al. 1990 (52)	1974–1986	<i>Not significant.</i> Neither a cap on noneconomic damages nor a cap on total physician liability reduced average award size or claims frequency significantly. Premiums in states with caps on noneconomic damages were no lower than in states without caps on noneconomic damages. (However, having a cap on total physician liability reduced premiums for general surgeons by an average of 13 percent in the year after adoption and 34 percent over the longer term.)	Very strong analysis overall. <i>Strengths:</i> Controls for a very wide range of confounding variables. Separately tests different kinds of caps. <i>Limitations:</i> Large number of variables included in the model may have adversely affected the statistical power of the model (its ability to detect significant effects).
Blackmon & Zeckhauser 1991 (4)	1985–1988	<i>Mixed.</i> In a model controlling for only four other kinds of tort reforms, having any kind of cap (whether on punitive or noneconomic damages) reduced insurer losses by 44 percent. However, in a model including a fuller range of other tort reforms, caps were not statistically significant.	Not a strong analysis overall. <i>Strengths:</i> Tests different model specifications to examine robustness of results. <i>Limitations:</i> Results in the restricted model are out of proportion to all other studies and not replicated in the more fully specified model. No control for state characteristics other than personal income growth. Cannot examine long-term effects of reforms passed in mid-1980s. Uses total rather than per-capita premium data. Groups together all kinds of caps.
Viscusi et al. 1993 (50)	1985–1988	<i>Not significant.</i> Insurer losses in states with any kind of noneconomic damages cap were not significantly lower. Premiums in states with any kind of damages cap were no lower than in uncapped states.	Not a strong analysis overall. <i>Strengths:</i> Separately tests different kinds of caps. <i>Limitations:</i> Incomplete controls for other tort reforms and inappropriate method of controlling for them. Uses total rather than per-capita premium data.
Kessler & McClellan 1997 (22)	1984–1993	<i>Significant.</i> Growth in self-reported premiums in states adopting “direct” tort reforms (either noneconomic or total damages cap, abolition of punitive damages, abolition of mandatory prejudgment interest, or collateral-source rule reform) was 8.4 percent lower at three years post-adoption. After one year, the effect size was 2.1 percent.	Fairly strong analysis overall. <i>Strengths:</i> Estimation method provides very strong control for state characteristics. <i>Limitations:</i> Groups together all kinds of caps, and groups caps with other tort reforms, so effect of noneconomic caps cannot be isolated. Uses self-reported rather than actual premium data.

[†] Table adapted from Michelle M. Mello and David M. Studdert, *Understanding Medical Malpractice Damages Caps*, working paper 2006.

Appendix III Summary of Studies on Impact of Caps on Noneconomic Damages[†]

Authors	Data Years	Findings	Methodological comments
Klick & Stratmann 2003 (24)	1980-1998	<i>Mixed results.</i> Counterintuitively, \$250,000 caps did not significantly affect physician supply but \$500,000 caps did. States with the higher cap had three percent more doctors per 100,000 population than states without them.	Not a strong analysis overall. <i>Strengths:</i> Estimation method and model specification provide very strong control for state characteristics. Separately tests different levels of caps. <i>Limitations:</i> So many controls for state characteristics that model may be overspecified. Results are counterintuitive.
Hellinger & Encinosa 2003 (20)	1985-2000	<i>Significant.</i> States with caps have, on average, 12 percent higher physician supply per capita than states without caps, although physician supply has grown in both types of states.	Not a strong analysis overall. <i>Strengths:</i> Good controls for state characteristics other than tort reforms <i>Limitations:</i> Does not control for other tort reforms. Estimation method is not appropriate to the structure of the dataset. Groups together all kinds of caps.
Danzon et al. 2004 (10)	1994-2003	<i>Mixed.</i> Caps on noneconomic damages of \$500,000 or lower were associated with six percent lower growth in premiums . Caps above that level did not significantly affect premiums.	Not a particularly strong analysis overall. <i>Strengths:</i> Separately tests different kinds of caps. Sophisticated estimation method. <i>Limitations:</i> Inappropriate averaging of company-specific premium data. Potentially overspecified model.
Matsa 2005 (27)	1970-2000	<i>Not significant.</i> The association between caps and overall physician supply was not significant, although caps did increase supply 10–12 percent from 1970 to 2000 for specialists in extremely rural areas.	Strong analysis overall. <i>Strengths:</i> Good controls for state characteristics including tort reforms. Sophisticated estimation method. <i>Limitations:</i> Groups together all kinds of caps.
Thorpe 2004 (43)	1985-2001	<i>Significant.</i> Having any kind of noneconomic damages cap reduced the growth of premiums by 12.7 percent.	Strong analysis overall. <i>Strengths:</i> Good controls for state characteristics including tort reforms. Models both total premiums and per-capita premiums. <i>Limitations:</i> Groups together all kinds of caps.
Viscusi & Born 2005 (49)	1984–1991	<i>Significant.</i> States with any kind of noneconomic damages cap had 16 percent lower insurer losses and 6.2 percent lower growth in premiums than uncapped states.	Not a particularly strong analysis overall. <i>Strengths:</i> Longitudinal analysis method captures change over time. Good controls for market factors affecting premiums and losses. Thorough sensitivity analyses confirm robustness of results. <i>Limitations:</i> Incomplete controls for other tort reforms. Groups together all kinds of caps. Uses total rather than per-capita premium data.
Encinosa & Hellinger 2005 (13)	1985-2000	<i>Mixed.</i> Counties subject to any damages cap (whether \$250,000 or higher) had two percent higher physician supply per capita than counties without caps (three percent in rural counties); the difference was statistically significant. However, results not published in the paper showed, counterintuitively, that the \$250,000 cap was not significant but the higher cap was.	Fairly strong analysis overall. <i>Strengths:</i> Good controls for state characteristics including tort reforms. Sensitivity analyses tested different levels of caps separately. <i>Limitations:</i> Unpublished results are counterintuitive, raising questions about the model.
Kessler et al. 2005 (23)	1985-2001	<i>Significant.</i> “Direct reforms” (e.g., caps on damages) are associated with three percent higher growth in physician supply after three years. The effect size varies by specialty, e.g., 12 percent difference for emergency medicine physicians but no significant difference for surgeons or radiologists. The effect is mainly due to retirements and entries rather than interstate relocations.	Strong analysis overall. <i>Strengths:</i> Estimation method provides very strong control for state characteristics. <i>Limitations:</i> Groups together all kinds of caps, and groups caps with other tort reforms, so effect of noneconomic caps cannot be isolated.

[†] Table adapted from Michelle M. Mello and David M. Studdert, *Understanding Medical Malpractice Damages Caps*, working paper 2006.

Tort-reform advocates point to California's Medical Injury Compensation Reform Act (MICRA) as proof that caps on noneconomic damages can combat volatility in professional liability insurance premiums. MICRA was a package of tort reforms that included a non-inflation-adjusted limit of \$250,000 on noneconomic damages. MICRA was passed in 1975, but legal challenges to its constitutionality were not settled until 1985. Opponents of MICRA-style reforms argue that California's lower premium growth is due not to MICRA, but to an insurance reform package known as Proposition 103 (Cal. Ins. Code §§ 1861.01–.16), approved by California voters on November 8, 1988. The most important features affecting professional liability insurance were (1) a requirement that insurers immediately roll back their rates by 20 percent; and (2) a requirement that insurers submit proposed changes in their rates for prior approval by the state insurance commissioner after November 8, 1989.

Evaluating competing claims about MICRA and Prop. 103 is challenging; no rigorous studies of its effects on malpractice premiums have been undertaken. There is a temporal correlation between the passage of Prop. 103 and the leveling off of malpractice premiums in California around 1988–1989; however, it is difficult to infer a causal relationship because of two potentially confounding factors. First, legal challenges to MICRA were settled shortly before then, and one would expect the full effect of MICRA to manifest itself at that time. Second, the malpractice crisis of the mid-1980s started to abate around this time in many states across the country. One way of analyzing the effect of Prop. 103 is to examine how the specific regulatory provisions actually played out. California is not the only state to adopt a prior-approval requirement; about a dozen states have such a rule. A handful of academic studies have analyzed the influence of rate-regulation regimes on malpractice premiums and most have not found prior approval to be a significant predictor, although one well-designed, controlled study did find that prior-approval states had lower premiums in the late 1970s and early 1980s (52).

The effect of a prior-approval rule may vary depending on how stringently the insurance commissioner exercises his discretion to disapprove proposed rate changes. Data from the California Department of Insurance on closed rate filings show that in 2000–2003, the Department received 59 medical malpractice insurer requests for rate increases (not including requests from insurers that handled only dentists or podiatrists). Excluding five cases in which the insurer withdrew the request, the Department approved the full increase or close to the full increase requested 89 percent of the time. The median premium increase approved was 11 percent and the largest was 80 percent. The Department received eight requests for rate decreases and fully approved all of them. These findings suggest that during the period of the malpractice crisis, the prior-approval rule has infrequently prevented insurers in California from receiving requested rate increases. It is possible that it deterred some from requesting increases.

What about the 20 percent rollback? In the early years of Prop. 103, three malpractice insurers reportedly returned over \$89 million to physicians due to the rollback. However, in 1994, the California courts held that the automatic 20 percent rollback provision was unconstitutional because it could deprive insurers of a fair rate of return. Subsequently, the insurance commissioner softened the provision: insurers would only have to reduce premiums insofar as their rate of return exceeded a “fair” rate of 10 percent. Thus, Prop. 103 has effected some rebates of malpractice premiums, but they have not been as large as voters intended.

In summary, the uniqueness of Prop. 103's particular combination of insurance reforms, and the fact that its adoption coincided with a significant shift in the malpractice insurance environment nationwide, makes it difficult to rigorously test its effect on malpractice premiums. It seems likely that both Prop. 103 and MICRA have played a role in controlling the growth of premiums in California.

Notes

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