

TRENDS

The Medical Malpractice ‘Crisis’: Recent Trends And The Impact Of State Tort Reforms

Do recent events constitute a crisis or merely the workings of the insurance cycle?

by **Kenneth E. Thorpe**

ABSTRACT: By many accounts, the United States is in the midst of its third medical malpractice “crisis.” Physicians in several states are facing high and rising premiums. The largest national medical malpractice carrier and some large multistate physician-backed liability firms have recently left the market. Rising premiums are traced largely to increases in claims severity. Capping malpractice payments has been advanced as one approach to slowing the growth in premiums. This analysis finds that premiums in states that cap awards are 17.1 percent lower than in states that don’t cap. At issue, however, is whether these stopgap solutions promote the goals of the U.S. liability system.

BY MANY ACCOUNTS, the United States is in the midst of its third “crisis” in medical malpractice. The medical malpractice “crises” in the mid-1970s and 1980s occurred during times of rapid growth in insurance premiums. In the 1970s rising claims frequency and severity resulted in the exit of many malpractice carriers.¹ Some for-profit liability carriers were replaced by a new wave of physician-owned malpractice companies. Medical liability premiums increased sharply again during the 1980s, leading several states to adopt reforms designed to limit malpractice insurers’ costs. Indeed, the events of the 1980s led to proposals for broader, more fundamental reforms of the liability system.

Both rising premiums and a reduction in the number of firms offering coverage characterize the most recent medical malpractice crisis. Depending on the specialty and state, the median increase in malpractice premiums ranged from 15 to 30 percent. Rate increases in

other states, such as Pennsylvania, ranged from 26 to 73 percent in 2003.² The St. Paul Companies, the largest insurer throughout most of the 1990s, stopped writing policies during 2002. Other large, regional carriers have also exited the market. Overall, these insurers accounted for nearly 14 percent of the national market prior to the crisis.³ In several states facing the most acute crises, carriers exiting the market accounted for a substantial (up to 40 percent) share of premiums written.

While premiums have risen sharply over the past three years, there is much variation across states. The premium spikes have resulted in physician strikes in West Virginia, work slowdowns in New Jersey, and some temporary closings of hospital services (such as trauma care at the University of Nevada Medical Center). Physicians in other states, such as Connecticut, are staging rallies at their state capitol, demanding “tort” reform. A recent analysis by the American Medical Associ-

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ation (AMA) reports that twelve states face crises in their medical liability systems, with problem signs appearing in another thirty.⁴ However, there does not appear to be a crisis in the remaining states, as growth in insurance premiums has been low.

The spike in premiums has created much tension within the physician community. Prospects for federal tort reform limiting payments from malpractice suits have been improved by support from President George W. Bush and a lobbying campaign by the AMA. The House of Representatives recently passed the Help Efficient, Accessible, Low-Cost, Timely Healthcare (HEALTH) Act of 2003 (H.R. 5), which would limit payments from malpractice claims. However, similar legislation has not passed in the Senate.

The crux of the debate focuses on the underlying causes of the most recent rise in premiums. Providers point to a rise in jury awards and rising costs of defending malpractice claims (rising severity). They also highlight the role that contingency fees paid to attorneys play in creating incentives for “frivolous” suits. Some consumer groups, however, believe that rising rates can be traced to lower returns on investments received by the medical malpractice carriers and a downturn in the economy. Such disagreements have led to a contentious debate over what, if any, changes should occur in medical malpractice liability law. This paper examines recent trends in the medical malpractice industry and estimates the impact that tort reforms could have on premiums.

Trends In Key Medical Malpractice Premiums And Financial Ratios

The past four years have seen rising medical malpractice premiums, declining profits, and a reduction in the number of liability carriers offering insurance (Exhibit 1). According to data collected by the National Association of Insurance Commissioners (NAIC), total medical malpractice premiums earned (those retained by malpractice insurance carriers) increased by 23 percent in 2002.

These averages mask variation in the growth in premiums across states. Premium increases in several states, including Florida (more than a 50 percent premium increase for internists) and Ohio (more than a 60 percent premium increase for some internists), were substantial. However, other states such as California saw very small premium increases.

The most important drivers of recent rate increases are (1) severity (awards, settlements, and defense and administrative costs); frequency (claims per insured physician); and (3) changes in investment income. In combination, these factors largely determine expenses and, when compared with premiums earned and investment income, are an indication of overall profitability.

One widely used profit measure is the loss ratio (awards, settlements, and defense costs as a percentage of premium). Exhibit 2 presents data concerning the combined loss ratio, a broader measure that also includes dividends paid to policyholders and corporate income

EXHIBIT 1 Trends In Medical Malpractice Premiums, As Percentage Change, 1998–2002

Year	Premiums earned (%)	OB-GYN premiums (%)	Internal medicine premiums (%)	General surgery premiums (%)
1998	9.1	0.3	-2.9	1.0
1999	3.9	2.1	5.1	1.1
2000	5.3	4.8	7.3	7.0
2001	14.1	10.3	9.9	12.0
2002	23.2	14.2	20.0	21.9

SOURCES: Premiums earned: National Association of Insurance Commissioners data; and premium increases for physician specialties: tabulations from the Medical Liability Monitor, 8 October 2002.

NOTE: OB/GYN is obstetrician/gynecologist.

EXHIBIT 2
Trends In Medical Malpractice Financial Ratios, 1995–2002

Year	Broad combined ratio ^a (%)	Loss ratio ^b (%)	Investment insurance ratio ^c (%)	Net income ^c (%)
1995	126	95	49	23
1996	124	91	44	20
1997	124	91	45	21
1998	126	92	43	17
1999	122	91	34	12
2000	129	103	33	4
2001	141	113	31	-10
2002	129	111	18	-11

SOURCES: Senate Committee on Health, Education, Labor, and Pensions hearing, 11 February 2003; and Tillinghast-Towers Perrin tabulations using the National Association of Insurance Commissioners filings of Physician Insurers Association of America (PIAA) companies for 2002.

^aAwards, settlements, and defense costs plus dividends, administrative costs, and corporate income taxes as a percentage of premium.

^bAwards, settlements, and defense costs as percentage of premium.

^cAs a percentage of premiums.

taxes, as well as investment income as a share of premium. Net income is the difference between the broad combined ratio and investment income.⁵

Several important trends appear in these data. First, the broad combined ratio, which measures claims payments, reserves for potential future awards settlements, and defense and administrative costs as a percentage of earned premiums, has risen since 1999. Thus, by 2002 every premium dollar collected resulted in \$1.29 in total expenses, awards, and settlements. Historically, malpractice carriers have offset these underwriting losses with earnings from investment income. Starting in 1995, investments as a share of premiums decreased sharply, falling thirty percentage points by 2002. All combined, these trends reduced carriers' overall net after-tax income from 23 percent to -11 percent by 2002.

What Accounts For The Deteriorating Financial Condition Of Malpractice Carriers?

Several factors likely account for medical malpractice carriers' deteriorating financial condition.⁶ At issue is whether the most recent trends reflect the traditional underwriting cy-

cle that will eventually regress to mean profits in the industry, or a permanent upward increase in average losses and premiums. Factors influencing these trends include the following.

■ **Traditional insurance cycle trends.**

Although all lines of insurance have underwriting cycles, the medical malpractice market experiences wider swings in profitability. Malpractice claims face a long lag from the time an event occurs and a claim is filed to the actual payout date. Premiums established in a given year are designed to cover the claims and defense costs associated with claims filed during the same year. However, it may take several years before claims and premiums can be reconciled to a given year, which adds much uncertainty in setting premiums. Unpublished data from one large carrier revealed that nearly 70 percent of claims were paid within five years of being filed. However, nearly 12 percent took at least eight years to resolve.

Firms' policies for setting aside reserves also influence calendar-year profits.⁷ Reserves are treated as an expense and, other things constant, reduce profits. During the early 1990s actual claims payments turned out to be lower than projected, and reserves set aside to pay future claims were too high.⁸ Over time,

loss reserves were reduced (thus reducing expenses), resulting in rising profits (lower loss ratios) during the early 1990s. The combination of relatively high investment returns and overreserving in the early and mid-1990s resulted in rising profits that encouraged some firms to hold the line on rates. With declining profits and a projected rise in costs, medical malpractice companies have increased their reserves by drawing down surplus, resulting in lower profits (higher loss ratios).

■ **High investment returns.** The net investment yield for malpractice firms increased to nearly 8 percent by 1998 and has since declined to approximately 6 percent.⁹ The growth in returns produced a high investment income ratio through 1998 but has decreased since then. Higher investment returns offset the need to raise premiums. A one-percentage-point increase in expected returns is associated with a reduction in premiums of two to four percentage points.¹⁰

■ **Rising severity.** Median malpractice awards (including both jury awards and settlements) per paid claim have doubled in real terms between 1990 and 2001.¹¹ The data indicate that severity has increased approximately 9 percent per year since 1990 (other estimates tracking the market are similar; see, for instance, data in National Practitioner Data Bank annual reports). Several factors may account for the rise in severity. (1) Rising economic costs (future medical expenses, lost wages) appear to be rising slightly faster than overall indemnity payments (the sum of non-economic and economic awards).¹² (2) Severity of injury per paid claim is also rising. (3) The share of million-dollar awards is also rising. The rise in payments over time is particularly high among cases with grave permanent injury. The Physician Insurers Association of American (PIAA) reports that nearly 8 percent of all awards now exceed \$1 million—double the share just five years ago.¹³ Data from Illinois reveal that average indemnity of paid claims for an adult with grave permanent injuries has risen from \$960,100 (during 1990–1994) to nearly \$1.6 million (1995–1999).¹⁴

(4) Defense and administrative costs are

also rising. Data from PIAA and several state insurance departments (such as Ohio and Illinois) show a sharp rise in defense and administrative costs per paid claim. Defense costs have greatly increased in the most severe cases (major and grave permanent injury).

■ **Rising costs of reinsurance.** The rise in claims severity flows through to the reinsurance market. Rising severity, coupled with the events of 11 September 2001, has led reinsurers to add to their reserves and increase reinsurance rates to medical malpractice companies.

■ **Reduced capacity.** The structure of the insurance market has changed dramatically in some of the states facing the sharpest rise in premiums (such as Nevada, West Virginia, Pennsylvania, and Ohio). Several years of underwriting losses led the St. Paul Companies, one of the largest national carriers, to increase its reserves by \$600 million in 2001 alone. It was the largest carrier in several states that are now facing sharp increases in medical malpractice premiums.¹⁵ For example, it was the second-largest insurer in Nevada by 1996, accounting for 32 percent of all written premiums.¹⁶

In addition to The St. Paul, several physician-owned companies—most notably, PHICO (in Pennsylvania) and PIE Mutual (in Ohio)—expanded their medical malpractice business outside their state of domicile. In virtually every case, these companies generated large operating losses outside their home states. By 1996 PHICO wrote medical malpractice policies in twenty states, while PIE Mutual entered about a dozen states. PIE Mutual had the largest market share—nearly a third of premiums written in West Virginia in 1996 alone. However, it was declared insolvent in 1998 and ceased operations. The Commonwealth of Pennsylvania declared PHICO insolvent in 2002. As a result, nearly a third of the physicians in West Virginia changed carriers. The St. Paul largely filled the void in West Virginia between 1996 and 2001. However, by 2001 it ceased writing new business, again placing West Virginia's physicians in a precarious position looking for new medical malpractice insurance coverage. The St. Paul announced in December 2001 that it would exit

the medical malpractice market altogether.¹⁷ The company's exit left more than 36 percent of Nevada's physicians looking for new coverage. More than a third of Ohio's physicians have changed liability carriers over the past five years as well.¹⁸

These recent changes in market structure have strained the underwriting capacity of medical malpractice companies in several states. Nearly 15 percent of the entire medical malpractice book of business nationally (highly concentrated in several states) has switched, or attempted to switch, malpractice companies since 1998. The issue here concerns liability companies' ability to write the new business. The remaining companies are drawing down surplus and increasing reserves in anticipation of rising claims payments. At the same time, the entire St. Paul book of business is seeking new coverage. Thus, an emerging issue is how much new business the remaining carriers can underwrite. Regulators and rating agencies (such as A.M. Best) use metrics such as the premium-to-surplus (PS) ratio for guidance regarding underwriting capacity, with PS ratios less than 1 preferred. In some cases, the PS ratios have been rising sharply, raising concerns about the (short-run) capacity of the remaining carriers to absorb the new business.

■ **Rising frequency.** While the number of claims per physician rose sharply between 1956 and 1990 (from 1.5 claims per 100 covered physicians in 1956 to approximately 15 per 100 in 1990, as reported by The St. Paul), the trends appear relatively flat nationally over the past couple of years. In some states (such as Missouri) reported frequency has declined.¹⁹ However, other states have reported a rise in frequency, particularly states with caps on noneconomic damages and no process for discouraging claims frequency (such as an affidavit or certificate of merit)—for instance, Louisiana reports approximately thirty-one claims per physician, double the national average.²⁰

Is This A Crisis, Or Simply The Workings Of The Insurance Cycle?

Certainly to the physicians facing 40–60 percent increases in their premiums, the recent spike in premiums is a crisis. With respect to the broader functioning of the market, however, the jury is out. Rising claims costs may reflect a rise in underlying negligence. If true, the system may be functioning as designed, and the spike in premiums may provide stronger incentives for physicians to im-

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prove the quality of care provided (the deterrence function of medical liability law). On the other hand, we may be observing a permanent rise in claims payments and costs unrelated to trends in physician negligence. At issue is the extent to which the underlying factors generating higher premiums are follow-

ing a traditional cyclical insurance pattern, or whether a structural change has occurred in severity and frequency.

The 2000 “crisis” does differ in several key respects from earlier ones. The substantial disruption in market supply in several states—traced to a handful of multistate physician-backed firms and the experience of The St. Paul—are new and, it is hoped, transitory events. It appears that a substantial share of the multistate, physician-owned companies have refocused their effects on their state of domicile. With The St. Paul now out of the market, both trends should eventually bring some stability into states that have been adversely affected. Thus, these substantial disruptions may not signal long-term structural problems of competition or capacity.

Second, many physicians also feel squeezed by rising insurance premiums and declining Medicare reimbursement. Indeed, the rise in premiums has occurred just as Medicare payments to physicians decreased 5.4 percent in 2003.²¹

With respect to broader structural changes, data from PIAA (along with some selected state data) reveal a long-term rise in claims severity.

In Illinois, for example, million-dollar awards accounted for 4 percent of all claims and nearly 42 percent of all indemnity payments between 1985 and 1989. By 1995–1999, 12 percent of all claims exceeded a million dollars, accounting for 52 percent of all indemnity payments.²² The PIAA data show a similar long-term trend. During 1990, 1.5 percent of all paid claims exceeded a million dollars. By 2001 the percentage had risen to 8 percent.²³

Policy Options For Addressing Medical Malpractice

The goals of the liability system are to provide financial incentives to deter substandard medical care and to compensate those injured by such care. There is some evidence that the current system performs poorly on both counts.²⁴ First, program administration—defense and underwriting costs—accounts for approximately 60 percent of total malpractice costs, and only 50 percent of total malpractice costs are returned to patients.²⁵ These costs are high even when compared with other tort-based systems, such as automobile litigation or airplane crashes, that determine fault and compensate victims.²⁶ Moreover, most patients that receive negligent care never receive any compensation. The Harvard Medical Practice Study found that only one malpractice claim was filed for every eight negligent medical injuries.²⁷ Second, deterring substandard medical care is a major rationale for using a tort-liability system for medical malpractice.²⁸ There is a considerable theoretical literature examining the potential of a tort-based system for optimally promoting safety.²⁹ Several empirical studies have also been conducted to evaluate whether the tort system deters medical errors. Overall, the literature is mixed.³⁰

The recent spike in premiums has renewed state and national interest in limiting claims payments. Several states adopted such limits in response to the spike in premiums in the 1970s and 1980s. More recent interest has been expressed by President Bush, the AMA, and others, in the form of supporting federal legislation capping award payments and reducing “frivolous” claims.³¹ Congressional Democrats

have advanced their own approach, aimed at curbing an exemption from antitrust laws provided under the McCarran-Ferguson Act. A key issue in the debate is whether state tort reforms slowed the growth in premiums and improved malpractice insurance firms’ profitability. To address this question, the final section examines the impact of existing state tort reforms on malpractice premiums and profits through 2001.³²

Impact Of Traditional Tort Reforms

Using new data from the NAIC, I examined trends in premiums earned and loss ratios, by state, for 1985–2001.³³ I estimated two versions of the premium model. The first entered total earned premiums as the dependent variable, with total nonfederal physicians as an explanatory variable. The second model entered earned premiums divided by nonfederal physicians as the dependent variable. The key explanatory variables used in the regression are the state tort reforms and other factors (outlined below) influencing claims payments, claims frequency, and insurer costs. I also examined the impact of competition on premiums and profitability over time.

■ **State tort reforms.** *Damage caps.* Damages in medical malpractice cases fall into three general categories: noneconomic damages (pain, suffering, anguish), economic damages (lost wages and medical care expenses), and punitive damages, if conduct is viewed as malicious or in reckless disregard of plaintiffs’ rights (these are rarely awarded). Only five states cap both economic and noneconomic damages, so I combined states that cap noneconomic damages or both noneconomic and economic damages into a composite “award cap” measure (twenty-four states by 2001). The empirical analysis was designed to assess the impact that award caps and caps on punitive damages, or not allowing punitive damages, have on profits and premiums.

Joint and several liability. Joint and several liability is the ability to collect the entire award from any liable defendant, independent of the degree of fault. This allows the plaintiff to collect from the group, or any individual provider,

the entire amount of the award. Tort reforms have limited this so that the defendant is not liable for more than his or her degree of fault and is not jointly liable with any other person for damages attributed to them.

Statutory caps on attorneys' fees. Attorneys in malpractice cases are generally paid a percentage of the award received by the plaintiff. These reforms limit the contingency fees attorneys may receive, which reduce the financial incentives to file a claim.

Collateral offset rule. This rule states that a plaintiff could recover the full amount of the reward even if the plaintiff received money from other sources such as health insurance or worker's compensation. Some states have adopted mandatory and discretionary offsets that reduce the award by the amount the plaintiff will receive from other sources, while other states allow the information on collateral sources to be entered as evidence before an award amount is determined. I use two measures in the analysis—one indicating whether the state had a mandatory offset for collateral sources, and a second for states that permit an offset for collateral sources.

In addition to state tort reforms, the analysis included other factors found by previous research to influence premiums and profits.³⁴ These include factors affecting the frequency of claims, including attorneys per capita, percentage of population in an urban area, unemployment rate, and the number of welfare recipients per 100,000 population. Factors affecting the severity of awards, such as surgi-

cal procedures performed per 100,000 population and per capita income, were also included. Finally, I examined the impact of competition on premiums and profits using the Hirschman-Herfindahl Index (HHI).³⁵

The final data set included all fifty states and the District of Columbia (cross-sectional) over seventeen years (time series). Using both random and fixed-effects models, I regressed the (log) loss ratio and earned premiums on state dummies indicating whether the state had adopted each reform, and if so in what year.³⁶ The key results are presented in Exhibit 3. The model was estimated using both fixed- and random-effects models.³⁷

■ **Empirical results.** The empirical results indicate that the caps on awards adopted by several states were associated with lower loss ratios and lower premiums (Exhibit 3). However, other than states with discretionary offsets, other tort reforms were not associated with lower premiums or improved profits. Loss ratios in states capping awards were 11.7 percent lower than in states without caps.³⁸ In addition, loss ratios were 13.3 percent lower in states with discretionary collateral offsets. Loss ratios were 25 percent lower in states that adopted both reforms. The impact of states with mandatory offsets on loss ratios was not significantly different from zero.

Premiums in states with a cap on awards were 17.1 percent lower than in states without such caps. When using earned premium per physician as the dependent variable, the caps were associated with a 12 percent reduction in

EXHIBIT 3
Impact Of State Medical Malpractice Tort Reforms On Loss Ratios And Premiums, Relative To No Tort Reforms

Performance measure	Awards caps	No punitive damage or punitive cap	Mandatory collateral offset rule	Discretionary collateral offset	Attorney fee caps
Loss ratio	-11.7% ($p = .06$)	NS	NS	-13.3% ($p \leq .10$)	NS
Total earned premium	-17.1% ($p < .05$)	NS	NS	NS	NS
Earned premium per physician	-12.7% ($p < .05$)	NS	NS	NS	NS

SOURCE: Author's analysis (regression results available upon request).

NOTES: Statistical findings denote difference from zero. NS is not significantly different from zero.

premiums. The analysis found no association between the adoption of other state tort reforms on loss ratios, premiums, joint liability, caps on attorneys' fees, or collateral offsets.

The results also highlight the effect of competition on premiums and loss ratios. Competition varies in the industry across states as well as over time. The results indicate that a 10 percent increase in the index (less competitive) is associated with a 2 percent increase in premiums ($p < .05$). Several states have seen considerable changes (both increases and decreases) in market competition during the past two decades. Some states, such as West Virginia, have become less competitive since 1996, while competition in other states has increased. The regression results indicate that the 20 percent rise in the HHI in West Virginia

between 1996 and 2001 was associated with a 4 percent increase in premiums. The HHI increased by 80 percent during this period in Minnesota (associated with a 16 percent increase in premiums) but declined by 40 percent in Idaho. So at least in some states, the rise in market concentration has contributed to higher medical malpractice premiums. The impact of market concentration on loss ratios was not statistically significant.

Conclusions

Physicians in several states are facing sharp increases in their medical liability premiums. As a result, some facilities have temporarily shut down; physicians in some states are reluctant to perform high-risk procedures; and early physician retirements appear to be on the rise.³⁹ These physicians, and their patients, are facing an important short-term crisis. A major part of the policy debate concerns the factors generating the large increases in premiums in some states. Rising severity is now a two-decade-old phenomenon in the industry. Several malpractice firms with substantial market shares in some of the hardest-hit states—Ohio, West Virginia, Pennsylvania, and Nevada—ei-

ther left the market, became insolvent, or refocused their underwriting in their state of domicile. These trends caused substantial disruption in the medical malpractice marketplace in these states. Thus, a major part of the crisis in these states concerns both severity and the resulting impact on underwriting capacity among firms remaining in the market.

The analysis indicates that capping payments from malpractice carriers was associated with lower premiums.⁴⁰ Yet how should

we interpret these results? At issue is whether we should adopt short-term, stopgap solutions to slow the growth in premiums, or use the recent experience to more fundamentally evaluate and perhaps reform the liability system. The recent spike in medical malpractice insurance premiums allows us an

opportunity to reexamine whether the tort system is achieving its goals. If it isn't, what changes in the system would improve the dual goals of deterrence and compensation? The results suggest that capping awards may improve the profitability of malpractice carriers and reduce premiums. Whether this is socially desirable or improves the goals of deterrence and compensation remains an open question.⁴¹

Another key question is the extent to which the most recent premium spike simply reflects the insurance cycle and changes in market structure and competition. Alternatively, do the recent trends also reflect a structural and secular rise in the severity of awards that, absent reforms, will permanently change the traditional insurance premium cycle? In this case, physicians could face several more years of rising premiums. Although experience varies across states, the data do indicate a long-term increase in awards and settlements per paid claim. At issue are the factors that underlie these trends. Do they reflect increases in the incidence of negligent adverse events and substandard physician care? If so, simply capping awards will ultimately result in lower growth in premiums but will leave unchanged

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the fundamental problem of rising standard care.

Surprisingly, we know very little about trends in the rates of negligent adverse events over time. The two most cited studies, from California in the 1970s and New York in the 1980s, suggest that these rates have been constant. More recent studies from Colorado and Utah conducted in the 1990s produced similar results.⁴² Clearly, more work in this area is required.

STOPGAP REFORMS (caps on awards) of our current liability system would ultimately result in lower premiums (relative to their levels without the caps). On the other hand, it is also important to evaluate any such reforms in the context of their ability to further the dual policy objectives of deterrence and compensation.

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NOTES

1. See, for example, R. Bovbjerg, "Legislation on Medical Malpractice: Further Developments and a Preliminary Report Card," *University of California, Davis, Law Review* 22, no. 2 (1989): 499-556.
2. As reported by *Medical Liability Monitor*, October 2003.
3. Tabulations from National Association of Insurance Commissioners, *Market Share Report—Medical Malpractice, 1997-2001* (Kansas City: NAIC, various years).
4. American Medical Association, "AMA Analysis: A Dozen States in Medical Liability Crisis" (Chicago: AMA, 17 June 2002).
5. This broader combined loss ratio combined with the investment income ratio produces a measure of net income. This is a standard measure used by actuaries in medical malpractice firms to measure changes in calendar-year profitability.
6. See, for example, Jim Hurley, Tillinghast-Towers Perrin, testimony before the House Energy and Commerce Subcommittee on Health, "Harming

Patient Access to Care: The Impact of Excessive Litigation," 17 July 2002. Much of the discussion in this section is based on my analysis of data from the NAIC. In addition, I benefited greatly from the analyses of Jim Hurley from his testimony and a recent study from the U.S. General Accounting Office, *Medical Malpractice Insurance, Multiple Factors Have Contributed to Increased Premium Rates*, Pub. no. GAO-03-702 (Washington: GAO, June 2003).

7. Actuaries use a variety of methods for establishing reserves for medical malpractice firms. Reserves are generally posted on a claim filed within ninety days of the date an expected loss is reported. Reserves depend on the number of claims filed, the firms' expectation of the percentage of claims that will result in a payment, expenses (defense costs), and the expected payout. Reserves are reported as part of the loss expenses incurred in each firm's statement of income. If reserves turn out too high (that is, expected payouts were lower than actual payouts), a credit on the income statement is taken in a later year. Therefore, expenses on an income statement reflect both actual benefit and loss payments during a year (for events that occurred in a prior year) and reserves for claims filed this year expected to result in a future payment. They also show up on the balance sheet as a liability.
8. Hurley, "Harming Patient Access to Care."
9. A.M. Best, *Aggregates and Averages, 1997-2002* editions (Oldham, N.J.: A.M. Best, various years).
10. The precise impact will depend on the length of time it takes to resolve a claim. Some states with fast-track laws resolve claims faster than other states. The shorter the tail, the less impact a one-percentage-point change in investment returns will have on premiums.
11. Median jury awards plus median settlements per paid (awards plus settlements) claim, derived from the Physician Insurers Association of America (PIAA) data-sharing project. See L. Bartholomew, "Using PIAA Data: A Valuable Resource" (Washington: PIAA, 17 May 2002).
12. Missouri Department of Insurance, *Medical Malpractice Insurance in Missouri* (Jefferson City: Missouri Department of Insurance, February 2003). These data also indicate a rise in severity of injury per paid claim.
13. Bartholomew, "Using PIAA Data."
14. Illinois Department of Insurance, *Medical Malpractice Claims Study* (Springfield: Casualty Actuarial Section, 2001).
15. The St. Paul Companies, "The St. Paul Announces Fourth-Quarter Actions to Improve Profitability and Business Positioning," Press Release, 12 December 2001.

16. Market share data are from NAIC, *Market Share Reports*, 1994–2001.
17. Tabulations by author from NAIC, *Market Share Report by Line of Business—Medical Malpractice, 1995–2001* (Kansas City: NAIC, 2003).
18. *Ibid.*
19. However, the number of liability companies with closed claims still flowing through the system that report claims has likely declined here as well. For instance, the 2001 totals do not include claims from PHICO. So it is not clear whether the reports of falling claims frequency are real or simply an artifact of exiting companies' failure to report closed claims to the state.
20. See, for example, LAMMICO, "The Letter" (no date provided), www.lammico.com/letter/article.asp?letter_article_id=294&letter_id=35 (23 July 2003).
21. The scheduled 4.5 percent additional cut was recently replaced by a 1.5 percent increase in payments in 2004. See H.R. 1, *The Medicare Prescription Drug Improvement Act of 2003*.
22. Illinois Department of Insurance, *Medical Malpractice Claims Study*.
23. Bartholomew, "Using PIAA Data."
24. P.C. Weiler et al., *A Measure of Malpractice: Medical Injury, Malpractice Litigation, and Patient Compensation* (Cambridge, Mass.: Harvard University Press, 1993).
25. J.S. Kakalik and N. Pace, *Costs and Compensation Paid in Tort Litigation* (Santa Monica, Calif.: RAND, 1986).
26. Weiler et al., *A Measure of Malpractice*, 77–109.
27. *Ibid.*, 70.
28. W.B. Schwartz and N.K. Komesar, "Doctors, Damages, and Deterrence: An Economic View of Medical Malpractice," *New England Journal of Medicine* 298, no. 23 (1978): 1282–1289.
29. See, for example, S. Shavell, "A Model of the Optimal Use of Liability and Safety Regulation," *RAND Journal of Economics* 15, no. 2 (1984): 271–280.
30. See, for example, L. Dubay et al., "The Impact of Malpractice Fears on Cesarean Section Rates," *Journal of Health Economics* 18, no. 4 (1999): 491–522; F. Sloan et al., "Effects of the Threat of Medical Malpractice Litigation and Other Factors on Birth Outcomes," *Medical Care* 33, no. 7 (1995): 700–714; and Harvard Medical Practice Study, *Patients, Doctors, and Lawyers: Medical Injury, Malpractice Litigation, and Patient Compensation in New York* (Cambridge, Mass.: Harvard University, 1990), chaps. 8 and 10. For additional discussion concerning the paucity of published empirical work linking the threat of suit to lower rates of negligent adverse events (or a reduction in standard medical care), see M. Mello and T. Brennan, "Deterrence of Medical Errors: Theory and Evidence for Malpractice Reform," *Texas Law Review* 80, no. 7 (2002): 1595–1637.
31. In some states plaintiffs can file a claim with its initial adjudication completed by a medical review panel. Plaintiffs can use this process for discovery, and if concurrence is received from the panel, the claim may proceed. Plaintiffs in other states must receive an expert (outside) validation or certificate of merit before the claim proceeds. Limited expenses are incurred under the first approach, while the latter approach provides some financial incentive not to file a claim with low likelihood of receiving a positive verdict.
32. The two most recent studies were conducted by W.K. Viscusi and P. Born, "Medical Malpractice Insurance in the Wake of Liability Reform," *Journal of Legal Studies* 24 (June 1995): 463–490, which evaluated the impacts through 1991; and by S. Zuckerman, R.R. Bovbjerg, and F. Sloan, "Effects of Tort Reforms and Other Factors on Medical Malpractice Insurance Premiums," *Inquiry* 27, no. 2 (1990): 167–182, which tracked the impact of state reforms through 1986.
33. NAIC, *Profitability Report* (Kansas City: NAIC, 2003).
34. See, for example, Viscusi and Born, "Medical Malpractice Insurance"; and Zuckerman et al., "Effects of Tort Reforms." Also see F. Sloan, P.M. Mergenhausen, and R.R. Bovbjerg, "Effects of Tort Reforms on the Value of Closed Medical Malpractice Claims: A Microanalysis," *Journal of Health Politics, Policy and Law* 14, no. 4 (1989): 663–689.
35. This is a standard measure of market concentration. It is simply the square of each firm's market share summed. Data on market shares were derived from the NAIC and from unpublished data from the Congressional Budget Office.
36. Data on state tort reform laws were initially developed using information from the Web site of a specialty law firm, McCullough, Campbell, and Lane, www.mcandl.com/states.html (30 July 2003). When information from this site was not clear, state insurance departments were asked for clarification. Finally, I compared these results with those used by the CBO to develop its estimates in developing H.R. 5, as seen at CBO, "H.R. 5: Help Efficient, Accessible, Low-Cost, Timely Healthcare (HEALTH) Act of 2003," 10 March 2003, www.cbo.gov/showdoc.cfm?index=4091&sequence=0 (30 July 2003). The classification used in the analysis was identical to that used by the CBO.
37. I ran both fixed- and random-effects models for the premium and loss-ratio regressions. The results from the Hausman Test do not allow us to

reject the null hypothesis that coefficients estimated using random and fixed effects are the same. The fixed-effects estimate indicated that state award caps were associated with premiums that were 17.1 percent lower, and the random-effects estimate produced the same result. Thus, while the random-effects results are displayed, the fixed-effects results were the same for the tort-related variables. J.A. Hausman, "Specification Tests in Econometrics," *Econometrica* 46, no. 6 (1978): 1251–1271. Regression to the mean could also be an issue if states with high premiums adopting the award caps tended to return to the average over time. Thus, caps in high-premium states experiencing regression to the mean would appear more effective than laws in average- or low-premium states. Using 1985 data on states that had no award cap (about forty-five states), I estimated the premium regression (absent the tort variables). I estimated a second regression using the residuals (from the 1985 regression) as the dependent variable, a dummy set to 1 if the state ultimately adopted an award cap, as well as the other independent variables outlined in the text. If regression to the mean were an issue, the coefficient on the dummy variable would be positive and significant (that is, high-premium states adopted caps). The t-statistic on the dummy variable in this regression was -0.22 . Since there was no apparent relationship here, there would be minimal (if any) bias due to regression to the mean. For a related test, see D. Dranove and K. Cone, "Do State Rate Setting Regulations Really Lower Hospital Expenses?" *Journal of Health Economics* 4, no. 2 (1985): 159–165.

38. The percentage changes reported here took each dummy variable from the log model and transformed them to a percentage change using the methods outlined in P. Kennedy, "Estimation with Correctly Interpreted Dummy Variables in Semi Logarithmic Equations," *American Economic Review* 71, no. 4 (1981): 801.
39. In a recent Georgia survey of physicians, a third of obstetrician/gynecologists and a fifth of family practitioners stated that they would stop performing high-risk procedures. Another 12 percent noted that they would not cover the emergency room in the future. *BNA's Health Care Policy Report* 11, no. 5 (2003): 162.
40. This means that premiums are lower than they would be in the absence of award caps. It does not imply that the premiums decline. Premiums in states with award caps have risen over time, but they are lower than they would be absent the award caps.
41. At issue is whether the reforms would reduce deadweight loss associated with defensive medicine and costs of administering the system and

improve deterrence and compensation. Some commentators are dubious about the prospects. See P. Danzon, *Medical Malpractice: Theory, Evidence, and Public Policy* (Cambridge, Mass.: Harvard University Press, 1985). However, any such analysis must also consider the impact that high premiums have on the availability of and access to medical care services.

42. California Medical Association and California Hospital Association, *Report on the Medical Insurance Feasibility Study*, ed. D.H. Mills (San Francisco: CMA/CHA, 1977); and D. Studdert et al., "Negligent Care and Malpractice Claiming Behavior in Utah and Colorado," *Medical Care* 38, no. 3 (2000): 250–260. These studies have generally concluded that approximately 3.7 percent of hospital admissions are associated with an adverse event and that approximately a quarter of these are due to negligence.