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IMPACTS OF U.S. TORT SYSTEM CHANGES

- 1) Letter: 11/08/1989, To: David Rogers From: James Jordan
- 2) Report: Assessing the Effects of Tort Reform
- 3) Report: The Frequency and Severity of Medical Malpractice Claims
- 4) Letter: 08/05/1988 To: Mary Pierce From: Allan Kaufman, enclosure
- 5) Report: The Impact of Tort Changes on Insurance Rates
- 6) Report: State Responses to the Malpractice Insurance Crisis of the 1970s, Frank Sloan

IMPACTS OF U.S. TORT SYSTEM CHANGES

STATE OF ALASKA

DEPARTMENT OF COMMERCE & ECONOMIC DEVELOPMENT

DIVISION OF INSURANCE
November 8, 1989

STEVE COWPER, GOVERNOR

P. O. BOX D
JUNEAU, ALASKA 99811-0800
PHONE: (907) 465-2515

Mr. David E. Rogers, Lawyer
P.O. Box 33932
Juneau, AK 99803

Dear David,

Re: Information Requested by Liability Insurance
Tort Reform Task Force

Attached please find the various pieces of information requested by the task force. The information that is included is unabridged so that you can see the detailed information. You may wish to provide extracts to the task force members.

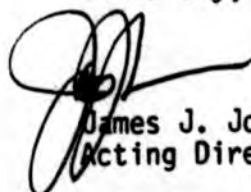
As you will note from the detailed information, the division was unable to discover any studies that quantified the impact on insurance rates due to legislative changes in the tort system. I've included in the information a copy of a memorandum dated January 25, 1989 that provides the results of a survey of insurers regarding the expected rate impact of Initiative #2. This may be of some assistance. Additionally, I'm aware of several "closed claim" studies which may be of interest (ISO study and State of Texas). I've been unable to locate those studies in my office, however, should you think these studies to be of interest to the task force, let me know, and I'll inquire as to getting replacement copies of those studies.

You will also note that the rate filings requested are quite voluminous. This, however, is the result of distilling your request down to a reasonable and representative number of filings. Should you have trouble in extracting the information you require, you may call upon Don Koch or Stan Garlington for interpretative assistance.

The list of items attached is as follows:

1. Division of Insurance - Overview of Justification;
2. Initiative #2 Survey;
3. Market Availability Information (Koch memorandum of October 13, 1989);
4. Example of Rate and Form Filing Activity; and
5. Rate Filing Compilation.

Sincerely,



James J. Jordan
Acting Director

Assessing the Effects of Tort Reforms

Stephen J. Carroll
With Nicholas Pace

RAND

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INSTITUTE FOR
CIVIL JUSTICE

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R-3554-ICJ

Assessing the Effects of Tort Reforms

Stephen J. Carroll
With Nicholas Pace

1987

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The Institute for Civil Justice

The Institute for Civil Justice, established within The RAND Corporation in 1979, performs independent, objective policy analysis and research on the American civil justice system. The Institute's principal purpose is to help make the civil justice system more efficient and more equitable by supplying policymakers with the results of empirically based, analytic research.

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The Institute is supported by pooled grants from corporations, private foundations, trade and professional associations and individuals. The Institute disseminates the results of its work widely to state and federal officials, legislators, and judges, to the business, consumer affairs, labor, legal, and research communities, and to the general public.

Foreword

Over the past several years, the body of state law governing compensation for personal injury and property damage has been substantially reworked. In the course of what has come to be called "tort reform," at least 41 states revised one or more aspects of tort liability and/or damage principles to a greater or lesser degree.

Tort law is, of course, constantly evolving; every day, in courts across the country, judges—and indirectly, lawyers and jurors—are making the law. The cumulative effects of these changes in case law may well outweigh the effects of any changes that might be made in a single legislative session. Nevertheless, the fact that so many states have made statutory changes in tort principles within such a short time has led many to expect major shifts in the outcomes of the tort liability system. Indeed, the expectation of such changes leads some to support tort reform and others to oppose it.

In the aftermath of tort reform (or in the political struggle to achieve or stop it), legislators, interest group representatives, journalists, and others want evidence of the extent to which the reforms "worked." Many of those who supported tort reform look for immediate reductions in liability insurance premiums. Others are less clear about what outcomes would prove tort reforms are producing the salutary effects promised by their supporters—or the dire consequences warned about by their opponents. The one thing on which everybody agrees is this: More data are needed. Just what data are needed, or how much, or what quality, or for what period of time, is often unspecified.

Researchers at The Institute for Civil Justice have often bemoaned the lack of reliable, comprehensive data on the civil justice system. Such data provide the necessary empirical groundwork for sound decisionmaking. Developing empirical databases requires time, money, and effort; but no matter how much time or money is expended, data will not prove useful if the data collection effort begins without clearly defined questions for researchers to answer.

As indicated in this report, there are numerous questions about the consequences of tort reform. Different questions imply different data requirements and different research strategies. Data that are relevant to one question may not have anything to say about another. Approaches that might be successful in answering some questions may not succeed in answering others. Policymakers must decide which questions are most important, which need to be answered first, and what resources to devote to finding the answers. The goal of this report is to provide a framework for addressing these issues.

Kevin F. McCarthy
Director, The Institute for Civil Justice

Executive Summary

This report offers a framework for assessing the effects of tort reforms. It attempts to provide a coherent structure for systematically thinking about how research can contribute to the policy debate over tort reform. Specifically, the report has three purposes:

- To alert policymakers to the issues that need to be considered when assessing tort reform.
- To suggest the kinds of research needed to illuminate the major policy issues.
- To offer some guidance to data collection efforts by identifying the kinds of data required to perform the needed studies.

WHAT DO WE NEED TO KNOW?

The reform debate has focused heavily on the relationship between the tort system and the costs and availability of insurance; but analyses exclusively concerned with the relationship between reform and insurance costs would be grossly inadequate. Regardless of the effects of tort reforms on insurance costs and availability, their effects on the performance of the system are critical. Four basic policy questions need to be addressed to assess the effects of reforms on the performance of the tort system:

- How soon can we expect to see effects of reform?
- Have reforms affected the outcomes of disputes?
- Who won? Who lost? How much?
- Did reform affect economic outcomes or the frequency and severity of injuries?

HOW SOON CAN WE EXPECT TO SEE EFFECTS?

Changes in the law are rarely implemented right away and, in fact, some may never be fully implemented. The full effect of a reform might not be felt until constitutional challenges or questions regarding the interpretation of its language or its application to certain classes of cases are resolved. And even when the meaning of a reform is certain, it may have little effect until procedures to put it into operation (e.g., jury instructions or court rules) are developed. Further, the effects of reform will be realized only after those involved in the disputing process—attorneys, claims adjusters, and so on—have had sufficient time to learn what a change in the law may mean and modify their behavior accordingly.

Analyses of the timing of activities that influence the implementation process are needed. We also need studies of the ways parties involved in the resolution of disputes—judges, jurors, attorneys, claims adjusters, and so forth—behave during the implementation process. Finally, we need to know the differential effects of alternative implementation strategies.

Case studies of the behavior of people involved in dispute resolution are an appropriate strategy for studying the implementation of tort reforms. We need to examine and collect data on the actions of those involved in the resolution of disputes when the law is uncertain, and after the law is certain but its effects are still unknown. In either case, research needs to probe the expectations and perceptions of the parties and their reasons for acting as they did.

HAVE TORT REFORMS AFFECTED THE OUTCOMES OF DISPUTES?

We suggest that policy consider the effects of reforms on aggregate outlays and on the components of aggregate outlays—claim frequency, the percentage of claims closed with payment, and the average size of paid claims. Other dispute outcomes of policy interest include: disposition patterns, filing patterns, plaintiffs' and defendants' costs of litigation, and public costs of litigation.

Because all the claims resolved in a state at about the same time were resolved in the same legal environment, differences among these outcomes cannot result from differences in legal environments and cannot cast light on the issue of how reform affected the outcomes of claims. Research must, therefore, compare the aggregate outcomes of claims across states, over time, or both, to discern whether a dispute outcome—say, aggregate outlays—systematically differs from one legal environment to another.

Because outcomes can be affected by a variety of factors other than the legal environment, multivariate statistical analyses are needed to assess the effects of reforms.

The data needed include information on the aggregate outcomes of disputes, by state and year, relevant characteristics of each state's legal environment, by year, and the other factors that influence the outcomes of disputes, by state and year.

WHO WON? WHO LOST? HOW MUCH?

Any change in the outcomes of claims resulting from reform raises questions regarding the adequacy and equity of compensation. To address these questions, policymakers need to know how patterns of recovery are affected by reform. More specifically, policymakers need information on how changes in the law affect the probability of recovery, the amount a successful claimant recovers, and a claimant's net recovery for claimants with different characteristics and injuries. The effects of reform on the predictability of individual claim's outcomes and on disposition patterns, filing patterns, and transactions costs are also important policy concerns.

The effects of reform on individual claims can be studied through statistical analyses of the relationship between legal rules and the outcomes of individual claims, controlling for the characteristics of the claims and the parties and for other factors that can influence the outcomes of interest. Here, too, analysis must compare the outcomes of individual claims across states, over time, or both, to see whether individual disputes systematically differ from one legal environment to another.

Three kinds of data are needed to assess a reform's winners and losers, or alternatively, the effects of a reform on various kinds of claims: the outcomes and characteristics of individual claims resolved in reform and in nonreform states or within a reform state before and after reform, or both; relevant characteristics of each state's legal environment; and other factors that can affect the claims' outcomes.

DID REFORM AFFECT ECONOMIC BEHAVIOR OR INJURIES?

Modifications to the system, whether or not they have cost or equity effects, can affect such economic outcomes as the kinds, characteristics, and prices of goods and services available to the society. And if reform does affect the constellation of goods and services consumed in the

economy, these changes may affect the frequency and severity of injuries. Policy cannot neglect the effects of reforms on the deterrence functions of the system.

In principle, statistical approaches could be used to analyze the effects of reform on economic outcomes and the frequency and severity of injuries. In practice, however, these approaches may be infeasible. If producers do not develop and distribute different versions of their products in states with different liability standards, the availability, characteristics, and prices of products will not vary across states with different tort laws. The effects of reform cannot then be estimated by relating economic outcomes in different states to their legal environments.

Data requirements are uncertain because we cannot at this point identify clear research strategies. But we can be sure that the data requirements will be highly specialized: We will have to tailor data collection systems on a case-by-case basis.

WHAT CAN BE DONE NOW?

The kinds of data needed to assess the effects of reform are generally not now available. We do not systematically collect information on either outcomes or the factors that might influence outcomes. To conduct the necessary research, data collection systems will have to be designed and put into place.

While the need for better data on the performance of the tort system is clear, data collection efforts are expensive in terms of the direct costs of collecting the data and the indirect costs of diverting the attention and energies of those from whom the data are collected. Data collection efforts are warranted only when their benefits, measured by the value of the research the data make possible, outweigh their costs. The next step toward assessing the effects of tort reforms is to develop detailed designs for data collection efforts. These designs can then be evaluated, and those data collection efforts whose benefits warrant their costs can be undertaken.

Three types of new data collection systems need to be considered: (1) systematic efforts to obtain data from insurers and self-insured defendants on the aggregate outcomes of liability claims; (2) special surveys of claimants, the bar, and insurers to obtain the detailed individual claim information needed to identify reform's winners and losers; and (3) systems for collecting information both on the other factors that impinge on the behavior of participants in the tort system, and therefore have to be controlled for, and on economic outcomes and injuries.

Once feasible designs are constructed, they need to be evaluated to determine whether the research they will support is sufficiently important to warrant the costs of the data collection and analysis.

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Foreword

The ebb and flow of claims for compensation of wrongful bodily injury are among the most noted but least analyzed of contemporary social phenomena. Cries of alarm and outrage marked the exponential increase in the frequency of many types of these claims during the early and mid-1970s. The political noise level then died down during the latter part of the decade as claim frequency declined just as mysteriously as it had risen. Projections available to the makers of public policy had accurately predicted neither the upswing nor the downturn, and there were huge disparities among the experiences of individual states.

Meanwhile, entirely different things seemed to be happening to the average severity of bodily injury claims. Far from gyrating between growth and shrinkage as did frequency, average severity surged upward in a relentless expansion that continued throughout the decade at a rate in excess of even the rampant price inflation that characterized the economics of the period. Thus, whatever the variations in the frequency of claims, they became steadily more expensive, on average, even after the effects of inflation were discounted.

Medical malpractice claims were among the most celebrated examples of trends in both frequency and severity. They were often perceived as the bellwether of an historic shift in the national philosophy of compensable injury, which many observers believe is still under way. Almost all states reacted in mid-decade with a raft of changes in the tort law as applied to medical injuries only. Taken together, these changes added up to the most concerted statutory alteration of that body of law since widespread introduction of Workers' Compensation programs early in this century.

What happened then? Did the frequency or severity patterns of malpractice claims depart from those of other types of bodily injury claims? Can one largely explain the drop in frequency during the latter part of the decade as the result of the changes in the law? If so, which specific changes seem to have mattered most? To the extent

that shifts in the law do not explain claim behavior, what other factors can be shown to have been associated with it? Was there some relation between claim behavior and the number or concentration of physicians or of attorneys? Did the upward shift in the age profile of the society seem to make a difference? What about urbanization or other changes in the social structure?

These are not academic questions. The answers to them are precisely what policymakers need to know as they consider current proposals for changes in the law as well as measures that might affect the social structure. Answering these questions, however, is a formidable technical task. Analytic models suited to available data on closed and pending claims must be constructed and tested. The data must be closely examined and prepared for use. And the output of the model must be painstakingly reviewed to be certain that the conclusions reached are neither more nor less sweeping than the data will support.

This document reports the outcome of such a process as applied to the principal data sources available on the trends in medical malpractice claims during the 1970s. It is the first full-scale analysis of what actually happened to claim frequency and severity both before and after the rush of legislative change, and of why it happened as and where it did. For most of us, the analysis will confirm some hunches about what went on in that turbulent decade, but it will also disprove others. More important, it will give civil justice theorists, practitioners, and decisionmakers some solid evidence concerning what actually influences the rises and falls in these critical factors. And it provides analysts with a model and a methodology that we believe can be used in the study of other categories of claims.

In short, the study represents an important beginning toward a basic understanding of what determines the number and characteristics of compensation claims—an understanding that is critical to any attempt to adapt the civil justice system to deal with changes in frequency or severity. The capacity to trace such causative factors is one of the analytic capabilities that the Institute was established to create. We are particularly pleased to commend to the reader a work that presents both a most promising analytic tool and the practical results that emerge when that tool is applied to an unusually expensive and rapidly growing class of claims. We believe that the implications for the continuing malpractice debate are profound, but that the long-term significance of both method and findings is even greater.

Gustave H. Shubert
Director, The Institute for Civil Justice

Executive Summary

The frequency and severity of medical malpractice claims increased dramatically in the early 1970s. After 1975, claim frequency tapered off, but severity outpaced the rate of inflation throughout the decade. There was also considerable variation among states. In 1978, after the gap between the most and least litigious states had narrowed somewhat, there was still a twelvefold range in frequency and a thirtyfold range in severity. This study provides empirical evidence on the contribution of medical, legal, and other demographic factors to claim frequency and severity. These findings should be useful for determining appropriate policy changes that could be effective in controlling claim costs. A comparison of trends indicates that malpractice experience has been more extreme than that in other lines of tort law, but it is not unique. This suggests that a more extensive study is needed to examine the determinants of trends in litigation in general; however, such an analysis is beyond the scope of the present report.

We develop a simple theoretical model of determinants of claim frequency and severity to structure the empirical analysis and to show how feedbacks and lags in claim disposition complicate measurement of effects on claim filings. These lags are inherent in data on claims closed, which are the only data available. Data on claims closed in 1970 and 1975-78 are analyzed, using pooled time-series cross-section techniques to allow for correlation over time.

The main empirical findings are summarized below:

- Diversity and growth in claim frequency are partly the result of changes in medical services and would therefore not be fully eliminated even if legal environments were uniform. An increase of 100 doctors per 100,000 population is associated with an increase of 3.6 claims per 100,000 population.
- The density of lawyers per capita does not significantly affect claim frequency, after we control for physician density per capita and urbanization. The high simple correlation be-

tween lawyer density and claim frequency is a spurious reflection of the high correlation between lawyer density and physician density and between physician density and claim frequency.

- A no-fault automobile law does not significantly affect claim frequency. This is consistent with the above result and with the finding that increases in the number of lawyers tend to reflect increases in the demand for legal services and so do not depress earnings of lawyers (Pashigian, 1977).
- Claim frequency is not significantly related to the proportion of the population over 65 years of age, although the elderly have more potential claims, due to higher exposure to and rates of iatrogenic injury. Rough calculations suggest that the probability of suit, given an actionable injury, is four times lower for those over 65 than for those under 65.
- Pro-plaintiff changes in common law doctrines contributed significantly to the rapid growth in frequency and severity of medical malpractice claims in some states in the early 1970s. States that abolished charitable immunity and the locality rule and adopted informed consent and *respondeat superior* by 1970 had claim costs in 1976 over twice as high as states that had adopted none of these doctrines. Of the four, informed consent and *respondeat superior* appear to have had the greatest impact. The extension of these doctrines to other states was one factor narrowing the gap between the most and least litigious states.
- Because of long lags in disposition, effects of the statute of limitations are reflected in changes in claim closures with a lag. Long pre-1975 statutes of limitations and discovery rules contributed to higher claim costs in some states through 1978, with a greater impact on severity than on frequency. Although most states shortened their statutes in response to the 1974-75 crisis, the 1975-78 data still do not reveal the effects of these changes.
- Of the post-1975 tort reforms, caps on awards and mandatory offset of collateral compensation appear to have had the greatest effects. States enacting a cap are estimated to have had 19 percent lower average severity within two years. Mandatory collateral source offset in effect for two years is estimated to result in a 50 percent reduction in severity. However, these estimates, based on claims closed in calendar years 1975-78, cannot measure the full long-run effects on claim costs on a policy-year basis and may be influenced by

other factors occurring at that time, which could not be included in the analysis.

- After we control for medical and legal factors, urbanization remains a highly significant determinant of claim frequency and severity. The impact of urbanization cannot be explained in terms of per capita income, welfare or unemployment rates, capital-intensive medical facilities, or frequency and severity in other liability lines.
- Tort reforms were more numerous and were enacted earlier in highly urbanized states and those that adopted pro-plaintiff common law doctrines early; in states with high insurance premium levels or proposed increases; and where multiple insurance companies were active in the market.
- Although some of the post-1975 tort reforms had an early effect on severity and contributed to narrowing the gap between the most and least litigious states, they cannot explain the reduction in malpractice claim frequency in 1976-77. Other factors that probably contributed but cannot be investigated with the available data include a reduction in the flow of injuries as a result of more careful practice and more institutionalized quality control on the part of medical providers faced with a greater risk of being sued, and the working through the system of the backlog in claims that became actionable as a result of the pro-plaintiff trends in common law in the 1960s. Because statutes of limitations are now shorter, similar change in the future should be less destabilizing.

Acknowledgments

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THE FREQUENCY AND SEVERITY OF MEDICAL MALPRACTICE CLAIMS: NEW EVIDENCE

PATRICIA M. DANZON*

I

INTRODUCTION

Physicians have been liable for medical malpractice since the eighteenth century in the United States, but malpractice claims were rare until recently. In the late 1960's the frequency of claims per physician and claim severity (size of award per paid claim) began to increase at unprecedented rates, culminating in the medical malpractice insurance "crisis" of the mid-1970's. In response to this crisis, legislatures in almost every state enacted tort reforms intended to curb the rise in claims, in addition to other changes designed to assure the availability of malpractice insurance.¹

Between 1975 and 1978, claim frequency per physician slowed or even decreased in many states, but since 1978, claim frequency has resumed an upward trend. The St. Paul Fire and Marine Insurance Company (The St. Paul), which has been the leading writer of malpractice insurance for many years, reports a fifty-five percent increase in claim frequency since 1980—from 10.5 claims per 100 physicians in 1980 to 16.3 in 1984.² Claim severity increased faster than the rate of inflation throughout the 1970's, and this trend appears to have continued into the 1980's. The St. Paul reports that paid claim severity increased ninety-five percent during the five year period 1979-1983, from \$27,408 in 1979 to \$53,482 in 1983.³ The average malpractice jury award is reported to have risen from \$404,726 in 1980 to

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1. See e.g., P. DANZON, *MEDICAL MALPRACTICE: THEORY, EVIDENCE, AND PUBLIC POLICY* 97-117 (1985); S. LAW & S. POLAN, *PAIN AND PROFIT: THE POLITICS OF MALPRACTICE* 161-94 (1978). Most of the changes were enacted during 1975-1976, with effective dates shortly following enactment.

2. ST. PAUL FIRE & MARINE INS. CO., *PHYSICIANS' AND SURGEONS' UPDATE: A SPECIAL REPORT* 3 (1985).

3. *Id.*

\$954,858 in 1984.⁴ This upward trend in claim costs, together with the recent spate of large malpractice premium increases, has revived interest in tort reform and hence in the impact of the reforms enacted after the 1975 crisis.

To date, there have been only two published statistical analyses of the impact of tort reforms and other factors on malpractice claims. My earlier analysis of tort claims during the 1970's concluded that the increase in claims over time and the persistent diversity in experience among states could only partly be explained by such factors as the increase in the number and complexity of medical treatments and the concomitant increase in exposure to the risk of iatrogenic injury.⁵ The pro-plaintiff trend in common law during the 1950's and 1960's also appears to have contributed significantly to the rise in claim frequency and severity. The other major factor contributing to the diversity among states was urbanization; however, the specific characteristics of urban environments that generate higher frequency and severity could not be identified. Differences in the number of attorneys per capita, the cost of medical services, per capita income, and unemployment rates did not appear to play a significant role.

This early analysis found mixed effects of the tort reforms enacted in response to the 1975 crisis. Limitations on the plaintiff's recovery (caps on awards) and mandatory offset of collateral benefits appeared, by 1978, to have significantly slowed the growth in claim severity in states that enacted such changes. However, none of the other changes, such as pre-trial screening panels or shorter statutes of limitations showed any impact on frequency or severity. Moreover, none of the reforms could explain, in a statistical sense, the lull in growth of claim frequency that occurred between 1975 and 1978. However, this early analysis, using data on claims closed through 1978, obviously did not purport to measure the long-run impact of the tort reforms enacted since 1975. In particular, any impact of shorter statutes of limitations on the "long tail" of claims would not have been evident. Even the estimates of the apparent short-run effects might have been contaminated by other unmeasured factors related to the crisis, such as changes in public attitudes, which might prove short-lived.

The only other broad-based statistical analysis of the effects of the 1970's tort reforms is Frank Sloan's analysis of malpractice insurance premiums paid by physicians from 1974 to 1978.⁶ Any effects of the tort reforms were even less likely to be detected in this study than in mine because many of the reforms only became effective on or after January 1, 1976, and it is reasonable to anticipate a lag in their effect on claims filed and closed. One could expect an even longer lag in effect on premiums, since insurers would require some

4. JURY VERDICT RESEARCH, INC., INJURY VALUATION REPORTS, No. 292, CURRENT AWARD TRENDS 18-19 (1985). This average is based on non-zero awards.

5. This study analyzed the determinants of trends in the frequency and severity of claims between 1970 and 1978. P. DANZON, THE FREQUENCY AND SEVERITY OF MEDICAL MALPRACTICE CLAIMS (The Rand Corp., Report No. R-2870-ICJ/HCFR, 1982).

6. Sloan, *State Responses to the Malpractice Insurance "Crisis" of the 1970's: An Empirical Assessment*, 9 J. HEALTH POL., POL'Y & L. 629 (1985).

experience under the new laws before adjusting premiums. Thus, it is not surprising that Sloan found little impact from the tort reforms. Specifically, he concluded that the only reforms having a statistically significant impact on premiums were screening panels, which appeared to reduce premiums, and statutes permitting binding arbitration of malpractice claims, which appeared to increase premiums.⁷ The only significant non-legislative variable was the surgery rate.⁸

The Sloan and Danzon analyses appear to differ in their estimates of the impact of attorney availability. Sloan found that the number of attorneys per capita appeared to have a positive impact, with a rather low level of statistical significance dependent on the other variables included in the regressions. In contrast, Danzon found that attorney density did not increase malpractice claim costs. Sloan concludes that "[v]iewing the empirical evidence in its entirety, the notion that a ten percent increase in a state's lawyer/population ratio leads to almost a like percentage increase in premiums . . . is a distinct possibility."⁹

A plausible reason for the apparent difference in findings is that Sloan's analysis did not control for urbanization. Urban areas tend to have a high density of lawyers per capita, but other characteristics of urban environments may also raise claim frequency and severity. Failure to control for urbanization would then lead to an upward-biased estimate of the impact of attorney density on claims. The reason is that the attorney variable would "pick up" the effect of the other unmeasured characteristics of urban areas that are positively correlated with attorney density. Danzon also found a positive relation between attorney density and claim frequency and severity if the urbanization variable was omitted, but the attorney effect became insignificant once urbanization was included.¹⁰

Given the recent rise in claims and severity as well as the necessarily less-than-definitive nature of previous analyses, the time is ripe for additional information. The study reported here updates the earlier estimates of how tort reforms and other factors have affected trends in malpractice claim frequency and severity, using nationwide claims experience over the full decade 1975 through 1984. The length of time since the enactment of the 1975-1976 tort reforms should, in principle, now be long enough to estimate their long-run impact. However, in practice several difficulties remain. First, the reforms have been subject to legal challenge in many states, and final rulings on their validity have been long delayed. For example, the California cap on awards for pain and suffering was not finally upheld in state court until early 1985, and it was not until October 1985 that the U.S. Supreme Court

7. *Id.* at 636, 639-40.

8. *Id.* at 641.

9. *Id.* at 643.

10. Although it is difficult to distinguish empirically the net impact of two highly correlated variables, urbanization appears to be a more important variable than attorney density because urbanization, if included alone, has higher explanatory power; when both variables are included, it alone is significant.

refused to hear the case.¹¹ To the extent that the disposition of malpractice claims over the last decade has been influenced by uncertainty as to the ultimate judicial outcomes, it may still be too early to estimate the full long-run effects of those reforms that have been upheld.

A second practical difficulty is the lack of a consistent and comprehensive data base. The medical malpractice insurance market has undergone substantial changes since 1975 in the identity of carriers and types of coverages. Several major stock insurers have withdrawn from the market, while the market shares of new entrants—physician-owned mutuals, hospital "captives," and joint underwriting associations (JUA's)—have grown rapidly.¹² A substantial fraction of the market has also changed from an "occurrence" policy—to a "claims-made" policy. The occurrence policy covers all claims arising out of medical incidents occurring in the policy year, regardless of the date of claim filing. In contrast, the claims-made policy covers only claims filed in the policy year, regardless of the date of injury, provided that the physician was covered by a claims-made policy with that company at the time of the injury. Although these changes in liability insurance markets are not expected to affect the behavior of patients and courts with regard to filing and disposing of claims, the large number of insurers who have had a significant market share for at least some fraction of the period under study makes collection of a comprehensive data base on claims experience very costly. The switch from occurrence to claims-made coverage further complicates the estimation of trends. It particularly complicates the estimation of trends in claim frequency, because the number of claims reported tends to be low in the early years of claims-made coverage, and rises as the policy "matures"—even when there is no change in the underlying frequency of claims filed.

The following report on malpractice claims begins with a brief description of the data base and methodological issues which are covered in more detail in the appendix. The next section analyzes the frequency of claims filed and claims closed with payment. Trends in malpractice claims severity are then analyzed. The concluding section summarizes the findings of the report.

II

DATA AND METHODS¹³

A. Data

My earlier analysis of malpractice claim trends in the 1970's drew on a database of virtually all claims closed from July 1975 through 1978, collected in a special survey by the National Association of Insurance Commissioners

11. *Fein v. Permanente*, 38 Cal. 3d 137, 695 P.2d 665, 211 Cal. Rptr. 368, cert. denied, — U.S. —, 106 S. Ct. 214 (1985).

12. See Posner, *Trends in Medical Malpractice Insurance, 1970-1985*, LAW & CONTEMP. PROBS., Spring 1986, at 37, 39-47.

13. For details, see appendix, *infra* at 80-84.

(NAIC).¹⁴ Since 1978, there has been no national compilation of malpractice claims. Data for this study were requested from most of the insurers that have had a significant market share at any time from 1975 through 1984. Several of the largest stock insurers and physician-owned companies, covering roughly 100,000 physicians, provided data in the format and detail requested. Forty-nine states are represented for at least some years. It remains possible that the data base may not be fully representative of the situation nationwide. Where relevant, this possibility is noted in the discussion of empirical findings below.¹⁵

B. Methodology

In attempting to measure the effects of various factors, including tort reform, on malpractice claim frequency and severity, statistical methods compare the average experience of physicians in different states and at different points in time over the ten years between 1975 and 1984. The units of observation are not individual claims, but individual states in each year. The variables requiring explanation are claim frequency per 100 physicians and average severity per paid claim in each state. To estimate the impact of a particular tort reform, one cannot simply compare the experience of state X before and after enactment of the reform, because other factors may also have changed over the same time span. Similarly, one cannot simply compare, at a particular point in time, states that have enacted a particular reform and states that have not, because other factors may contribute to any observed differences between states. For example, assume that state A, which enacted a cap on awards, had a twenty percent higher claim severity in 1984 than did state B, which did not have a cap. One should not infer that A's cap had no effect, because claim severity might have been fifty percent higher in A than in B had the cap not been enacted. Thus, to estimate the net impact of the cap, or any other factor, a study must employ statistical methods that attempt to "control" for other factors.¹⁶

The number of factors that can be controlled for depends on the number of independent observations in the sample, which determines the "degrees of freedom," and depends on the subset of the observations that have the

14. The NAIC, an organization composed of all current heads of state insurance regulatory agencies, collected claim experience data from all companies with more than one million dollars in malpractice premium volume in any year since 1970. See NAT'L ASS'N OF INS. COMM'RS, MALPRACTICE CLAIMS: FINAL COMPILATION 3-6 (M. Sowka ed. 1980) (hereinafter cited as NAIC STUDY).

15. For example, data published by the American Medical Association show significant differences in claim frequency for 1983, by type of insurer. Physician-owned companies linked to medical societies report 24 claims per 100 insured physicians in that year, compared with only 10 per 100 physicians for commercial companies and 11 per 100 for independent provider-owned insurers. SPECIAL TASK FORCE ON PROF. LIAB. AND INS., AM. MEDICAL ASS'N, PROFESSIONAL LIABILITY IN THE '80s, REPORT 1, at 10 (1984) (originally published as a supplement to AM. MED. NEWS, Oct. 1984). These differences could reflect such factors as differences in states in which the companies do business, difference in underwriting stringency, and simple differences in claim reporting practices or policy maturity.

16. On the use of statistical regression analysis, see generally Rubinfeld & Steiner, *Quantitative Methods in Antitrust Litigation*, 46 LAW & CONTEMP. PROBS., Autumn 1983, at 69, 88-104.

characteristic of interest. In this data base there are observations on over forty-five states in each of ten years, but the effective degrees of freedom are less than 450 (forty-five times ten), to the extent that experience in successive years in any state is not fully independent of experience in the same state in prior years. This complicates measurement of statistical significance. Further, it is not possible to measure the effect of each different variant of each reform—for example, a cap on pain and suffering damages at \$250,000, another cap at \$100,000, and so on—because the number of observations on each variant is too small. Therefore, for most reforms, the average impact for each general type of change has been estimated. There are two exceptions: separate estimates were made for the effects of mandatory and discretionary collateral source offset, and for different types of legislation regarding screening panels. In the appendix, Table A1 provides definitions, the mean values, and standard deviations of all variables.¹⁷

It is possible that post-reform trends in the various states are influenced not only by the reforms themselves, but also by the underlying factors in each state that led them to enact or not enact various reforms. For example, tort reforms were probably more likely to be adopted in states with a high underlying propensity for litigation. To control for this possibility, both two-stage least squares (TSLS) estimates and ordinary least squares (OLS) estimates are reported. The TSLS results are probably more reliable. Further detail appears in the appendix.¹⁸

III

DETERMINANTS OF MALPRACTICE CLAIM FREQUENCY

A. Theoretical Model of Claim Frequency

A rigorous statement of the theoretical model underlying the empirical estimates is given elsewhere.¹⁹ The frequency of malpractice claims per physician is expected to depend on the rate of iatrogenic injury in current and prior years. The rate of iatrogenic injury depends on the number and types of patient contacts per physician and on the rate of injury per patient contact, which in turn may partially depend upon physicians' incentives to practice with care. Under a negligence rule of liability, in principle only those iatrogenic injuries that result from violation of the standard of due care are actionable. Thus, for any given *flow* rate of iatrogenic injuries per year, the number of potential malpractice claims depends on the standard of care applied by the courts. The *stock* of potential claims in any year, then, depends on the flow of potential claims in prior years and on the statute of limitations which limits the period of time within which a potential claim must be filed.

The number of claims actually filed in any year from the stock of potential claims depends on the expected costs and benefits of suit to plaintiffs and

17. See *infra* at 81.

18. See *infra* at 82-83.

19. P. DANZON, *supra* note 5, at 10-15.

plaintiffs' attorneys. The costs and benefits, in turn, depend on legal rules and norms that determine the probability of winning, the potential award or settlement if successful, and the costs of bringing suit. The number of claims closed with payment in any year depends on the frequency of filing in prior years, on lags in claim disposition, and on the proportion of filed claims which are either dropped or dismissed without payment.

Because legal changes and other factors are expected to affect claim filings and disposition by calendar year, the analysis here is on a calendar year basis, rather than an insurance policy year. For practical reasons, the frequency experience under claims-made and occurrence coverages was analyzed separately. In the available data base, the occurrence experience consists largely of the "tail" of late claims filed more than two years after the policy period, whereas the claims-made data are more representative of all types of claims, at least for the later years. The states represented also differ slightly between the occurrence and claims-made samples.

In order to measure the net impact of tort reforms, controlling for demographic factors, estimates of the impact of demographic variables on claim frequency are reported first. Table 1A estimates the impact for all claims filed, and Table 2A estimates it for those claims closed with payment. Estimates of the impact of tort reforms on claims filed and claims paid are reported in Tables 1B and 2B, respectively. Each of the law-reform variables was added separately to the basic equation that includes all demographic variables reported in Tables 1A and 2A.²⁰

B. Findings

1. *Time Trends.* The St. Paul reports an average annual growth rate of claim frequency per physician of ten percent over the decade 1975-1984, with a slower rate in the first four years followed by some acceleration since 1979. Because this estimate is based on their combined occurrence and claims-made coverage, it is not seriously biased by the change in policy form.²¹ By contrast, the growth rate estimated here from the claims-made sample alone (Table 1A) is fourteen percent per annum, which overstates the true trend in frequency because it reflects, in part, the maturing of new claims-made policies, particularly for the first half of the decade. This phenomenon illustrates the potential for upward bias in estimates of true growth in claim frequency based on the experience of new companies offering claims-made coverage. The trend estimated from the occurrence sample of negative thirty-

20. Because the coefficients of the TSLS equations changed very little depending on which law was added, only one illustrative set is reported to show the impact on the demographic coefficients of the two-stage procedure.

21. Perfect lack of bias would require that the exposure base (number and specialty mix of physicians) remain constant throughout the period. Claims filed in the first year of a claims-made policy include only claims filed within a year of an incident. The second year of coverage includes first-year claims for that year and second-year claims from the first year of coverage, and so on. A claims-made policy is considered "mature" by the fifth year.

TABLE 1A
MALPRACTICE CLAIM FREQUENCY: CLAIMS FILED 1975-1984

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Explanatory Variable	Claims-Made Policies				Occurrence Policies	
	Claims per Physician Log($\frac{F}{1-F}$)		Total Claims Filed (Log.)		Total Claims Filed (Log.)	
	OLS	TSLS	OLS	TSLS	OLS	TSLS
Intercept	-4.813** (2.69)	-5.311** (2.43)	-5.064** (2.81)	-5.133** (2.34)	8.412** (2.08)	7.866* (1.89)
Time	.141** (7.32)	.146** (6.19)	.151** (6.90)	.133** (5.83)	-.369** (7.50)	-.370** (7.54)
Exposure (log.)	—	—	1.039** (30.40)	1.010** (23.71)	.419** (9.47)	.420** (9.50)
Prior exposure (log.)	.069** (6.44)	.063** (4.76)	.061** (4.88)	.061** (4.09)	.086** (3.21)	.087** (3.26)
Surgical procedures per cap.	.011** (2.61)	.011** (2.19)	.012** (2.97)	.012** (2.40)	.006 (.86)	.006 (.95)
% Urban	.500** (2.63)	.285 (1.18)	.363** (1.87)	.226 (.94)	1.896** (5.11)	1.851** (4.87)
% Migrant	.013* (1.91)	.010 (1.13)	.012* (1.71)	.009 (1.09)	-.060** (4.50)	-.060** (4.51)
Unemployment rate	.008 (.35)	-.002 (.08)	.012 (.56)	-.001 (.02)	-.092** (2.16)	-.090** (2.11)
Income per cap. (log.)	-.070 (.32)	-.048 (.18)	-.079 (.37)	-.077 (.30)	-.397 (1.26)	-.379 (1.22)
Attorneys per cap.	-25.183 (.50)	-10.14 (.16)	-13.149 (.27)	.414 (.01)	4.738 (.20)	-2.073 (.07)
California	.977** (7.78)	1.239** (6.92)	.865** (7.03)	1.117** (6.34)	5.284** (9.85)	5.307** (9.89)
Illinois	—	—	—	—	.920 (1.99)	1.001 (1.47)
Maryland	—	—	—	—	.373 (.61)	.285 (.45)
New Jersey	—	—	—	—	2.353** (3.39)	2.356** (3.37)
New York	—	—	—	—	1.207 (1.78)*	1.207* (1.68)
Arizona	—	—	—	—	.968 (1.47)	.906 (1.36)
R ²	.672	.584	.901	.864	.693	.695
DW	1.46	1.34	1.47	1.34	1.08	1.08
p	.27	.33	.26	.33	.46	.46

* p > .10
** p > .05

Using a two-tailed test. See appendix for discussion of possible bias in t-statistics.

TABLE 1B
MALPRACTICE CLAIM FREQUENCY: CLAIMS FILED 1975-1984

Explanatory Variable	Claims-Made Policies		Occurrence Policies			
	Claims per Physician Log ($\frac{F}{1-F}$)		Total Claims Filed (Log.)		Total Claims Filed (Log.)	
	OLS	TSLS	OLS	TSLS	OLS	TSLS
Statute of limitations	-.008 (.99)	.089** (2.83)	.009 (1.10)	.082** (2.63)	.052** (2.33)	.060 (.52)
Collateral source offset	.137** (2.09)	-.194* (1.79)	.148* (2.28)	-.155* (1.37)	-.294* (1.81)	-.812** (2.90)
Mandatory collat. offset	.149** (2.03)	-.013 (.15)	.153** (2.12)	.057 (.40)	-.399** (2.16)	-1.468** (2.60)
Panel	.102 (1.82)	-.050 (.17)	.109* (1.94)	-.009 (.03)	-.074 (.48)	.423 (.77)
Mandatory panel	.049** (1.97)	-.045 (.52)	.055** (2.16)	-.013 (.13)	.049 (.88)	.077 (.35)
Fee limit	.102 (1.54)	-.110 (.71)	.124* (1.86)	-.030 (.18)	-.270* (1.64)	-.465 (1.05)
Arbitration	.221** (3.51)	.554** (3.28)	.226** (3.66)	.594** (3.57)	.103 (.55)	-.239 (.43)

* p > .10

** p > .05

Using a two-tailed test. See appendix for discussion of possible bias in t-statistics.

TABLE 2A
MALPRACTICE CLAIM FREQUENCY: CLAIMS PAID 1975-1984

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	Claims-Made Policies				Occurrence Policies	
	Claims per Physician $\log\left(\frac{F}{1-F}\right)$		Total Claims Paid (Log.)		Total Claims Paid (Log.)	
	OLS	TSLS	OLS	TSLS	OLS	TSLS
Intercept	-9.045** (3.99)	-9.965** (3.87)	-8.168** (3.09)	-8.225** (2.92)	9.817** (2.41)	9.721** (2.32)
Time	.213** (8.76)	.217** (8.34)	.206** (7.42)	.208** (7.01)	-.254** (5.16)	-.254** (5.16)
Exposure (log.)	—	—	.964** (8.84)	.940** (16.98)	.265** (5.92)	.265** (5.92)
Prior exposure (log.)	.130** (9.54)	.126** (8.59)	.164** (5.23)	.164** (8.39)	.104 (3.95)**	.104 (3.94)**
Surgical procedures per cap.	.028** (5.43)	.028** (5.13)	.031** (5.23)	.031** (4.85)	.011 (1.75)*	.011 (1.74)*
% Urban	-.647** (2.71)	-.782** (2.93)	-.501** (1.75)	-.615** (1.97)	2.714** (7.25)	2.706** (7.03)
% Migrant	.005 (.58)	.003 (.30)	.009 (.89)	.007 (.63)	-.068** (4.99)	-.068** (4.99)
Unemployment rate	-.014 (.51)	-.021 (.68)	-.020 (.63)	-.031 (.88)	-.097** (2.27)	-.097** (2.26)
Income per cap. (log.)	.034 (.13)	.048 (.17)	-.109 (.14)	-.108 (.33)	-.923* (1.93)	-.920* (1.92)
Attorneys per cap.	-22.020 (.35)	-12.95 (.18)	-10.054 (.14)	1.120 (.01)	-32.91** (2.05)	-54.0 (1.88)
California	1.154** (7.26)	1.323** (5.69)	1.217** (3.76)	1.424** (6.22)	3.582** (6.64)	3.585** (6.63)
Illinois	—	—	—	—	-.990 (1.48)	-.974 (1.42)
Maryland	—	—	—	—	-1.400** (2.28)	-1.416 (2.23)
New Jersey	—	—	—	—	1.602** (2.29)	1.598** (2.28)
New York	—	—	—	—	.312 (.44)	.299 (.41)
Arizona	—	—	—	—	.382 (.58)	.371 (.55)
R ²	.74	.72	.85	.84	.53	.53
DW	1.30	1.22	1.60	1.49	1.05	1.05
p	.35	.39	.20	.26	.48	.48

* p > .10

** p > .05

Using a two-tailed test. See appendix for discussion of possible bias in t-statistics.

TABLE 2B
MALPRACTICE CLAIM FREQUENCY: CLAIMS PAID 1975-1984

	Claims-Made Policies				Occurrence Policies	
	Paid Claims per Physician $\log\left(\frac{F}{1-F}\right)$		Total Claims Paid (Log.)		Total Claims Paid (Log.)	
	OLS	TSLS	OLS	TSLS	OLS	TSLS
Statute of limitations	-.006 (.62)	.057* (1.65)	-.006 (.49)	.068* (1.66)	.047** (2.10)	.011 (.09)
Collateral source offset	.113 (1.36)	-.038 (.29)	.141 (1.47)	-.080 (.49)	-.421** (2.60)	-1.403** (2.25)
Mandatory collat. offset	.073 (.78)	.106 (.97)	.082 (.77)	.081 (.59)	-.331* (1.75)	-.956* (1.75)
Panel	.045 (.63)	.056 (.16)	.035 (.43)	.015 (.04)	.017 (.11)	.135 (.24)
Mandatory panel	.041 (1.29)	.087 (.80)	.026 (.68)	.092 (.73)	.056 (.98)	-.005 (.02)
Fee limit	.117 (1.40)	.125 (.64)	.125 (1.28)	.073 (.29)	-.033* (1.82)	-.408 (.91)
Arbitration	.183** (2.27)	.505** (2.46)	.205** (2.25)	.496** (2.10)	.270 (1.42)	.093 (.16)

* $p > .10$ ** $p > .05$

Using a two-tailed test. See appendix for discussion of possible bias in t-statistics.

seven percent per annum is best interpreted as the annual rate of "decay" of claim frequency in successive years after the year of practice.

The annual rate of growth of paid claims estimated from the claims-made sample, twenty-one percent, appears to be substantially higher than the fourteen percent for all claims filed. It might seem tempting to infer from the faster growth rate of paid claims either that the proportion of frivolous claims has declined or that insurers are becoming more willing to "buy out" of frivolous claims. No such inference is valid, however, because of the bias due to the maturing of the new claims-made policies. Because claims closed with payment take longer to settle than claims closed without payment, the proportion of claims closed with payment will be relatively low in the early years of new policies, but will rise as the policies mature. This trend implies a greater *apparent* growth in paid claims than in total claims, until the insurer's book of business is fully "mature," meaning that the number of new policyholders is equal to the number of terminations each year.

2. *Claims vs. Injuries.* Earlier analyses indicated that, at most, one in ten incidents of malpractice gave rise to a claim in the mid-1970's.²² Since then, the total number of claims has roughly doubled. It would be of great interest to know how much of this growth in malpractice claims reflects a growth in iatrogenic injury as opposed to an increase in the proportion of potential claims that are actually filed. Unfortunately, this comparison is not possible because there are no data on the actual number of iatrogenic injuries.

Several variables were included in this analysis as proxies for exposure to iatrogenic injury. Most consistently significant was the number of surgical procedures per capita, which is positively related to the frequency of claims filed per physician. Because it is unlikely that surgeons are systematically more negligent than other medical specialties, this result suggests that, for any given iatrogenic injury, the probability that a claim is filed is higher for surgical procedures. This hypothesis is plausible if iatrogenic origin is more obvious for adverse outcomes of surgical procedures than for other medical treatments, or if surgical mishaps tend to be more serious. Consistent with these hypotheses, the number of paid claims is more sensitive to the number of surgical procedures than is the total number of claims.²³ The frequency of late-filed claims²⁴ is not significantly related to the frequency of surgical procedures, suggesting that most surgery-related claims are filed relatively

22. See, e.g., P. DANZON, *supra* note 1, at 20-25.

23. The estimated elasticity of claims filed with respect to number of surgical procedures per 10,000 population is .01, and the elasticity of claims paid is .03, implying a higher conditional probability of payment, given that a claim has been filed, for claims involving surgical mishaps.

24. Late-filed claims are those in the occurrence sample that consist disproportionately of claims filed more than two years after the policy period in which the injury occurred. See *supra* text accompanying notes 11-12.

early. Again, this finding is not surprising, since surgical mishaps are more likely to be obvious.²⁵

3. *Non-Tort Sanctions.* Since 1975 many states have strengthened their procedures for quality control through medical quality assurance boards, partly as a quid pro quo for tort reform. In theory, the amount of malpractice and therefore the frequency of malpractice claims should be lower in states with active disciplinary boards. Contrary to this expectation, claim frequency tended to be positively related to the number of disciplinary procedures per 1,000 physicians, but statistical significance levels were low.²⁶ This finding suggests that disciplinary procedures are tightened in states experiencing high claim frequency. If so, in addition to having a direct effect on physicians' incentives, malpractice liability may have an indirect effect on the quality of care by creating incentives to strengthen other monitoring mechanisms. Failure to find a negative relation between disciplinary activity and claim frequency does not imply such activity has no impact on the rate of iatrogenic injury. Because a substantial fraction of negligent iatrogenic injuries did not result in claims in the mid-1970's—as many as nine out of ten²⁷—there could be a substantial reduction in injuries with little visible impact on claims.

4. *Urbanization.* My earlier analysis concluded that urbanization was the single most important factor contributing to interstate differences in malpractice claims. The results here tend to confirm that conclusion, with qualifications. First, while urbanization is positively related to the total number of claims filed, urbanization is negatively related to the number of paid claims. This suggests that urban areas may have a disproportionate number of "frivolous" or nonmeritorious claims. Second, the fact that the apparent impact of urbanization is much higher for the occurrence sample than for the claims-made sample suggests that urban areas have a disproportionate number of late-filed claims, even after controlling for the statute of limitations. These conclusions are somewhat tentative, however, because some major urban states may be underrepresented in this data base, particularly in the claims-made sample, and the state dummy variables may affect the urbanization coefficient.²⁸

5. *The Business Cycle.* It is often argued that personal injury and disability claims are inversely related to the business cycle. A plausible reason might be that when business activity is low and unemployment rates are high, the opportunity cost of time for attorneys and patients is low. Moreover, plaintiffs are less likely to have first-party insurance coverage through their employers,

25. In equations not reported here, claim frequency was found to be unrelated to the number of hospital admissions per capita, despite the fact that most malpractice claims arise out of hospital treatment.

26. In order to preserve degrees of freedom, this variable was not included in the final equations reported here.

27. See P. DANZON, *supra* note 1, at 20-25.

28. The state dummy variables in the tables indicate the states added to The St. Paul data base.

so they may be more willing to seek compensation through the tort system. The evidence here is inconsistent with this hypothesis. The frequency of total claims and paid claims is unrelated to the unemployment rate, and the frequency of late claims (occurrence-policy sample) is negatively related to the unemployment rate. There is also no systematic relationship between the frequency of malpractice claims and average per capita income in a state.

6. *The Doctor-Patient Relationship.* The rise in malpractice claims and the high incidence of claims in urban areas are often attributed to the erosion of traditional long-standing physician-patient relationships with a family physician, which, it is argued, constituted a psychological barrier to suit. This study attempted to measure this phenomenon by including as an explanatory variable the percentage of the state's population that had moved within the last five years (percent migrant). A relatively mobile population probably also tends to have less information about the quality of individual physicians' services. Hence physicians' incentives for care may be lower, which is another reason to expect a positive relation between population turnover and claim frequency. Contrary to these hypotheses, population turnover has no systematic impact, except for late-filed claims, where the impact is negative. This may reflect a higher cost of filing suit after moving from the area where the injury occurred.

7. *The Elderly.* Consistent with my earlier analysis, these data show no relationship between claim frequency and the percentage of the population over sixty-five, so this variable is omitted from the reported equations. Hospital admission rates for the elderly are roughly twice as high as for persons under sixty-five and a 1974 California study²⁹ showed a higher rate of negligent injury per admission for the elderly. Therefore, the absence of any significant difference in claim frequency implies that the probability of filing a claim, given a potentially actionable injury, is less than half that of persons under sixty-five. A plausible explanation is that the elderly have lower compensable damages.

8. *Number of Lawyers.* Also consistent with my earlier analysis, there is no evidence that a high density of lawyers per capita has any systematic impact on the frequency of claims filed, after controlling for other characteristics of areas with high lawyer density. Thus, that there is a high simple correlation between number of claims per physician and number of attorneys per capita appears to reflect the tendency of attorneys to migrate to areas where litigation rates are high (probably for other areas of law in addition to medical malpractice), rather than reflecting an independent effect of attorneys on litigation rates.

29. CAL. MEDICAL ASS'N AND CAL. HOSP. ASS'N, REPORT ON THE MEDICAL INSURANCE FEASIBILITY STUDY (D. Mills ed. 1977), discussed in P. DANZON, *supra* note 1, at 19-25.

C. Tort Reforms

In evaluating the evidence on the impact of tort reforms, it must be emphasized that there is some uncertainty as to the true levels of statistical significance because of the limitations of the data.³⁰ Conventional tests of significance were applied, using unadjusted standard errors and a two-tailed test. In cases where theory yields a clear prediction as to the impact of a particular law—for example, that the effect, if any, of a cap on recoveries should be negative—it may be more appropriate to apply a one-tailed test, in which case significance levels are twice those reported. Where claim frequency and severity are expressed in logarithmic form, the percentage impact of a reform is obtained by an exponentiation of the coefficients reported.³¹ In general, the OLS coefficients tend to be less negative than the TSLS coefficients. This result is consistent with the hypothesis that reforms were more likely to be enacted in states with high claim costs, so OLS coefficients are biased against observing any negative impact of reforms. The subsequent discussion is therefore based on the TSLS estimates.

The following results only show how much a particular reform affected experience relative to what that experience would have been had the law not been enacted. For example, the statement that reform X reduced claim frequency by Y percent does not mean that frequency fell by Y percent but that it was Y percent lower than it otherwise would have been. The percentage difference noted is the average differential in a single year if a particular change had been enacted and had not been overturned. As discussed above, since some of the reforms were under challenge and therefore might not have been enforced in all cases, the estimates reported here may understate the full long-run impact of a reform once it has been declared constitutional.³²

1. *Statute of Limitations.* States that have enacted shorter statutes of limitations have experienced some reduction in claim frequency. Reducing the statute of limitations for adults by one year reduces total claim frequency by eight percent and frequency of paid claims by six to seven percent.³³ This estimate is the *average* effect of a one-year reduction, measured at the sample mean of roughly five years. The mean effect cannot be extrapolated

30. Estimates of standard errors may be downward biased and significance levels may be upward biased due to serial correlation of residuals. See appendix, *infra* at text accompanying notes 50-54. On the other hand, the inevitable measurement error involved in collapsing multidimensional laws into simple binary variables probably introduces bias against finding any significant impact even where such an impact may exist. These two sources of bias operate in offsetting directions, but since their relative magnitudes are unknown, the net direction of bias in t-statistics is unknown.

31. For example, if the coefficient in the table is $-.15$, the percentage change in the dependent variable is $(1-e^{-.15})$ or -14% .

32. Note that if severity is increasing over time, a given *percentage* differential implies an increasing absolute dollar difference.

33. The occurrence sample shows a similar estimate (five to six percent for all claims and paid claims) but only the OLS coefficients are statistically significant.

indefinitely.³⁴ For example, since the number of claims filed declines with years elapsed from the date of injury, reducing a statute from ten years to nine years probably reduces claims by less than eight percent whereas reducing a statute from four years to three years may reduce claims by more than eight percent.

2. *Collateral Benefits.* The only other reforms that show any evidence of reducing claim frequency are laws that permit or mandate reducing awards by the amount of insurance coverage from other sources. Collateral source offset is estimated to reduce claim frequency by fourteen percent. The impact appears to be greater on claims filed late, but the magnitude of the effect on late-filed claims cannot be stated with precision.³⁵ Laws that simply admit evidence of collateral coverage seem to be as effective in reducing claim frequency as laws which mandate offset.

3. *Panels.* Screening panels do not appear to have had any systematic effect on either the total number of claims filed or paid. This finding is consistent with evidence from case studies of the operation of panels in individual states. Although the impact of screening panels varies substantially among states depending on the specific design of the panels, the evidence suggests that screening panels may even encourage filings by reducing the cost to the plaintiff of obtaining expert testimony.³⁶

4. *Arbitration.* In contrast to screening panels, the evidence suggests that laws permitting binding arbitration increased the frequency of claims filed and claims paid.³⁷ The impact appears to be greater for small claims than for claims involving serious injury. This inference is suggested by the fact that the measured effect of arbitration is smaller for the occurrence sample than for the claims-made sample. The former sample consists of disproportionate numbers of late-filed claims that typically involve more serious injuries. The latter includes a disproportionate number of minor claims. This finding is entirely consistent with one objective of arbitration proponents, which is to provide a less expensive recourse for small claims that might be barred by the costs of the tort system.

34. The estimate of the mean for the statute of limitations is based on the arbitrary assignment of 10 years for states with an unlimited discovery period.

35. The TSLS coefficient implies a 77% reduction in late-filed claims, which seems implausibly large.

36. See P. DANZON, *supra* note 1, at 198-202, and sources cited therein.

37. The coefficients imply as much as a 60% increase, which seems implausibly large, since arbitration would probably only be adopted by a minority of patients and providers even in states with enabling legislation.

IV

TRENDS IN MALPRACTICE CLAIMS SEVERITY

A. Theoretical Model of Claim Severity

Claim severity is measured by averaging the indemnity paid on claims closed with payment, including verdicts and out-of-court settlements. For some companies, reported indemnity includes loss adjustment expense, averaging roughly thirty percent of total indemnity.³⁸

It is important to note that trends and interstate differences in observed severity (the average amount actually paid in all cases) may understate real differences in "potential" severity (the expected payment at verdict or settlement for a specific class of injury), which can be called "jury generosity." The reason is that an increase in jury generosity not only raises actual payments on claims that would otherwise have been filed, but also encourages the filing of claims that would not be brought at lower levels of jury generosity. Specifically, higher generosity promotes the filing of more small claims and more claims with a low probability of winning. As the mix of paid claims becomes more heavily weighted with small claims, observed average severity per claim may fall even though each individual claim receives a larger award than it otherwise would. To measure interstate differences in jury generosity would require data on individual claims in order to control for "case mix" of claims. It cannot be measured by data available in this study indicating statewide average severity.

In theory, average severity is expected to depend on the "true" damages incurred on claims closed with payment and on the valuation of these damages by the courts. "True" damages depend on the mix of injury severity in the sample of claims receiving payment and on the plaintiffs' actual or potential wage loss, medical expenses, and noneconomic loss. In principle, rules of compensable damages determine the valuation of these damages by the courts, subject to interpretation by judge and jury. Whether changes in these rules have any impact in practice is one of the empirical questions being addressed here.

Of the post-1975 tort reforms, those most directly aimed at reducing severity are caps on awards (either on the total award or, more commonly, on the component for pain and suffering), modification of the collateral source rule (to admit evidence or mandate offset of compensation from other sources), and provisions for periodic payment of future damages. Ceilings or schedules for contingent fees may also reduce awards to the extent that they are enforceable and reduce the incentives of plaintiff attorneys to pursue claims. Although caps on awards and sliding-scale fee ceilings are most likely to affect very large potential awards, which are a small fraction of all claims,

38. Based on information received in a telephone communication with The St. Paul (Summer 1985). The company-specific dummy variables should control for differences in reporting practice.

these few cases account for a very large fraction of dollars paid. Therefore, they can substantially influence average severity.

Reducing awards is also one objective of arbitration proponents, since eliminating the role of the supposedly overgenerous jury is one of the major differences between arbitration and tort procedure. Finally, screening panels may affect potential severity, to the extent that panels change the cost of litigation or have direct power to determine damages. Panels may also indirectly affect observed severity to the extent that they screen out "frivolous" claims that might otherwise have been settled with a small payment. By so doing, panels may change the mix of claims paid and raise the average amount actually received.

TABLE 3A
SEVERITY PER PAID CLAIM (LOG_e) 1975-1984
CLAIMS-MADE AND OCCURRENCE POLICIES

	<u>OLS</u>	<u>TSLs</u>
Intercept	-1.062** (2.02)	-1.051* (1.90)
CIP (log _e)	1.940** (25.18)	1.918** (24.41)
% Urban	.679** (5.56)	.766** (5.81)
% Over 65	-2.185* (1.77)	-1.238 (.92)
Surgeons per MD	2.654** (3.32)	2.563** (3.18)
Attorneys per capita	16.370 (.78)	5.789 (.26)
Illinois	.520** (5.38)	.632** (5.50)
Maryland	.251* (2.00)	.202* (1.56)
New Jersey	-.262 (4.50)	-.257** (4.38)
New York	.268** (3.70)	.315** (4.07)
Arizona	-.504** (4.07)	-.446** (3.46)
California CM	.253** (2.83)	.387** (3.34)
California OC	-.353** (5.79)	-.219** (2.31)
R ²	.627	.624*
DW	1.387	1.382*
p	.306	.308*

* p>.10] Using a two-tailed test. See appendix for discussion of possible bias in
** p>.05] t-statistics.

* From equation with statute of limitations added. Values for equations including other laws were very similar.

TABLE 3B
SEVERITY PER PAID CLAIM (LOG_e) 1975-1984
Claims-Made and Occurrence Policies

	<u>OLS</u>	<u>TSLs</u>
Collateral source offset	-.102 ^r (1.72)	-.198 [*] (1.84)
Mandatory collat. offset	-.171 ^{**} (2.68)	-.114 ^{**} (2.05)
Cap	-.161 ^{**} (2.83)	-.263 ^{**} (2.04)
Panel	-.005 (.10)	.185 (1.70)
Mandatory Panel	-.015 (.89)	.054 (1.51)
Arbitration	-.126 ^{**} (2.22)	-.212 ^{**} (2.13)
Fee Limit	-.027 (.49)	-.036 (.34)

In order to analyze claim severity, the claims-made and occurrence data bases were merged because there are no strong theoretical or practical reasons for distinguishing them. In fact, combining them eliminates potential biases that would result from separate analysis. Table 3A reports estimates of the impact of demographic factors on average severity per paid claim. Table 3B reports OLS and TSLs estimates of the impact of tort reforms, obtained by adding each law separately to the basic equation in Table 3A.

B. Findings

1. *Time Trend.* Malpractice claim severity has risen roughly twice as fast as the Consumer Price Index (CPI).³⁹ This trend can only be explained partially by the fact that medical care prices have risen more rapidly than consumer prices in general, because medical expenses account for less than one-quarter of reported economic loss in malpractice cases closed with payment.⁴⁰ As noted above, this growth in average severity may understate the growth in the "generosity" of the tort system, to the extent that the potential for more generous awards induces the filing of more minor claims. Unfortunately, with these aggregated data it is not possible to tell whether the increase has been uniform in all cases or whether the largest awards have grown proportionately faster, as other studies of jury verdicts have found.⁴¹

2. *Urbanization.* Consistent with the findings of my earlier study, claim severity is significantly higher in urbanized states. The estimates imply that a ten percentage point increase in the fraction of a state's population living in urban areas is associated with roughly a seven percent increase in malpractice

39. The elasticity of severity with respect to the CPI is 1.9.

40. NAIC STUDY, *supra* note 14, at 51.

41. M. SHANLEY & M. PETERSON, *COMPARATIVE JUSTICE: CIVIL JURY VERDICTS IN SAN FRANCISCO AND COOK COUNTIES, 1959-1980* (The Rand Corp., Report No. R-3006-1CJ, 1983).

claim severity. However, the precise magnitude of the urban effect may be influenced by the particular mix of states in this data base. Moreover, company dummies occur disproportionately in large urban states. Therefore, to the extent that the company dummy variables capture state effects as well as company effects, the measured urban effect may understate the true urban effect.

Claim severity also is significantly higher in states with a high ratio of surgical specialists relative to medical specialists. This variable may capture the general effect of more complex medical practice, as well as the likelihood that surgical mishaps involve more serious injuries and are easier to prove.⁴²

3. *The Elderly.* As expected, average severity is lower in states with a relatively large elderly population in view of the lower compensable damages for the elderly. However, the level of statistical significance is low. The population over sixty-five accounts for only eleven percent of the total population on average and the evidence above suggests that it does not have a disproportionately high claim frequency. Therefore, even a small impact on overall average claim severity would imply that the average claim for persons over sixty-five is substantially less than a claim for persons under sixty-five. A substantial difference is not surprising in view of the low wage loss of the elderly. Low potential compensable damages presumably contributes to the low propensity to sue.

4. *Number of Lawyers.* There is no evidence that the number of lawyers per capita has any impact on claim severity. This is consistent with the findings of my earlier study and with simple economic theory. A high density of lawyers could depress the price of legal services, so that both the plaintiff and defendant would use more legal services. However, there is no reason to expect any net impact on the outcome from increased legal effort by both sides. It is more plausible that lower-priced legal services would encourage higher claims frequency, because the cost of filings could drop, but, as noted above, there was no evidence of this phenomenon.

C. Tort Reforms

The estimates of the impact of tort reforms are reasonably consistent with theory and with the earlier findings.

1. *Caps on Awards.* The average impact of the various statutes to cap all or part of the plaintiff's recovery has been to reduce average severity by twenty-three percent.⁴³ This observed average impact obviously masks great differences among cases. The majority of cases would be unaffected by most

42. A high probability of proving negligence tends to increase the amount paid in cases settled out of court, which represent the great majority of paid claims. P. DANZON & L. LELLARD, *THE RESOLUTION OF MEDICAL MALPRACTICE CLAIMS: RESEARCH RESULTS AND POLICY IMPLICATIONS* vi (The Rand Corp., Report No. R-2793-1CJ, 1982).

43. See *supra* notes 31-32 and accompanying text.

of the caps. Therefore, the impact on the few large awards that are affected must be substantially greater than the average over all cases. Because large awards account for a disproportionate fraction of total dollars (over fifty percent of dollars are paid on five percent of cases)⁴⁴ caps that severely reduce the few very large dollar awards can have a significant impact on the average and on the total payout.

2. *Collateral Source Offset.* Laws providing for collateral source offset appear to reduce awards by between eleven and eighteen percent. Coefficients are similar for laws mandating offset and laws permitting offset at the discretion of the court or jury, but significance levels are slightly higher for mandatory offset. This differs from the earlier analysis based on claims closed from 1975 to 1978,⁴⁵ which found a larger impact (fifty percent reduction) for mandatory collateral source offset and no effect for discretionary offset. The lower estimate obtained here is more consistent with a rough estimate based on estimates of the fraction of awards required to cover reported economic loss and the fraction of economic loss that might be covered by other sources of insurance. The latter approach yields a rough conclusion that mandatory offset of all collateral benefits might reduce average severity by thirty to forty percent.⁴⁶ Since some statutes apply only to a subset of collateral sources and offset is sometimes discretionary, the estimate here of an eleven to eighteen percent reduction resulting from the implementation of these statutes is quite plausible.

3. *Arbitration.* States that have enacted special statutes permitting voluntary binding arbitration have an average claim severity roughly twenty percent lower than other states. Taken at face value, this suggests that the impact of arbitration on cases actually arbitrated could be even greater, since cases arbitrated are probably still only a small fraction of total claims in most states with arbitration statutes. On the other hand, the decrease in observed severity may overstate the reduction in award for a specified type of case if arbitration increases the number of minor claims that are filed, as is suggested by the findings in Table 2B. With respect to the impact of arbitration on total claim costs, when taken at face value the coefficients imply that the twenty percent decrease in claim severity is more than offset by the increase in frequency of claims filed and claims paid. Thus, overall arbitration probably increases total claims costs, although it does appear to spread the total dollars over a larger number of plaintiffs. However, without more disaggregated data on the effects on individual cases and on litigation cost per case, these conclusions are tentative.

44. P. DANZON & L. LILLARD, *supra* note 42, at xv.

45. P. DANZON, *supra* note 5, at 30.

46. P. DANZON, *supra* note 1, at 169-70.

4. *Panels.* The evidence on the effect of screening panels on claim severity is not consistent across the different equations. A safe conclusion is that there is no evidence that screening panels consistently reduce claim severity.

V

CONCLUSION

The tort reforms enacted since the mid-1970's malpractice "crisis" affected the frequency and severity of malpractice claims over the decade from 1975 to 1984 in a manner broadly consistent with economic theory and with previous evidence. Although claim frequency and severity have continued to rise despite reforms, this trend does not indicate that the tort changes have had no effect. States that enacted shorter statutes of limitations and set outer limits on discovery rules have had less growth in claim frequency than states with statutes more lenient to plaintiffs. On average, cutting one year off the statute of limitations for adults reduces claim frequency by eight percent. The effect would presumably be greater for a reduction from, say, four to three years than from ten to nine years. (Percentage changes are the average differential in a single year, relative to what the situation would have been without enactment of the reform.).⁴⁷

Statutes permitting or mandating the offset of collateral benefits have apparently reduced malpractice claim severity by eleven to eighteen percent and claim frequency by fourteen percent relative to comparable states without collateral source offset. The feedback from a reduction in severity to a reduction in frequency is not surprising, since collateral source offset reduces the potential recovery for a large number of claims, thereby reducing incentives to file.

Caps on awards have reduced severity by twenty-three percent. This percentage represents the average impact of the various forms of cap, over the period between 1975 and 1984, during which time some statutes were still under challenge. If the dollar thresholds are not revised periodically to keep pace with inflation, the future effect will presumably be greater, unless juries find ways of implicitly circumventing the limits by increasing allowances for uncapped components of the award.

Arbitration statutes apparently increased claim frequency, but reduced overall average severity. Disaggregated data would be necessary to determine whether the reduction in observed average severity results from a reduction in awards per case or simply reflects the filing of more small claims. The net effect appears to be an increase in total claim costs, but compensation of more claimants.

None of the other reforms analyzed, including screening panels and limits on contingent fees, appears to have had any systematic impact on claim frequency or severity.

47. See *supra* note 33.

Among the other factors affecting claims, urbanization remains a highly significant factor that explains much of the observed difference among states in claim frequency and severity. The evidence suggests that urban areas have a particularly high frequency of nonmeritorious claims (those closed without payment) and claims filed more than two years after the alleged injury. Per capita income, the unemployment rate, and the number of attorneys per capita have no statistically significant effects. The surgery rate in a state increases claim frequency, and the ratio of surgeons to medical specialists increases claim severity.

An overall evaluation of the merits of the various tort reforms from a public policy perspective is beyond the scope of this paper and has been done elsewhere.⁴⁸ However, it is worth noting that on average, severity has increased at almost twice the rate of inflation of consumer prices over the last decade. Thus, in the absence of further statutory controls, the income of successful malpractice claimants—or at least some subset of them—will continue to rise relative to the income of the population as a whole, and relative to the income of other accident victims who are not compensated through the tort system. The optimal structure of tort awards therefore warrants further attention.

Also beyond the scope of this paper is the impact—actual and potential—of tort reforms on malpractice insurance premiums. The analysis here of impact on claim frequency and severity should not automatically be translated into an effect on premiums for several reasons. First, the net potential impact on premiums also depends on litigation expenses and changes in the timing of disbursement of loss reserves, and hence investment income. Second, reforms that reduce the uncertainty in estimating malpractice claim costs—namely, caps on awards, periodic payment of amounts for future damages, and shorter statutes of repose (running from date of incident, not date of discovery)—may be expected to reduce premiums by a modest amount, over and above the reduction in mean expected losses. One can expect this result because of the reduction in insurers' risk. Perhaps more importantly, by reducing uncertainty, such reforms should reduce the volatility in price and availability of malpractice insurance, which is a major inefficiency of the present malpractice system.

48. See, e.g., P. DANZON, *supra* note 1.

APPENDIX

A. Data

My 1982 analysis of claim frequency and severity used data from the National Association of Insurance Commissioners (NAIC) survey of claims closed between 1975 and 1978.⁴⁹ Since the termination of that survey, there has been no comprehensive collection of data on malpractice claims, other than by individual insurance companies for their internal purposes. Data for this analysis were requested from most of the individual companies and joint underwriting associations that have had a significant market share at any time during the period from 1975 through 1984. Many of the companies did not respond and others could not readily provide their data on a calendar and policy year basis. Theoretical considerations suggest analyzing claim frequency and severity by calendar year rather than insurance policy year, since tort reforms are likely to affect the filing and disposition of claims during the calendar years in which the laws are in effect. For occurrence coverage, claim frequency per insured physician in any calendar year depends on the number of physicians insured in prior policy years; the relevant number of policy years depends on the statute of limitations. Similarly, with claims-made coverage, reported claim frequency depends on the number of years of prior coverage with the same company for physicians currently insured. Thus, data on exposure (number of insured physician years) by policy year and on claims filed, claims closed and paid, by calendar year and corresponding policy year, were requested.

The data base used here includes the experience of The St. Paul, which insures over 55,000 physicians in over forty states, The Travelers (California), Medical Mutual Liability Insurance Society of Maryland, Southern California Physicians Insurance Exchange, Illinois State Medical Inter-Insurance Exchange, Medical Inter-Insurance Exchange of New Jersey, Medical Liability Mutual Insurance Company of New York, and Mutual Insurance Company of Arizona. Forty-nine states were represented for at least some years, but the sample size is small in some states for some years. State year observations with fewer than five insured physicians were deleted from the sample.

Use of these data is further complicated by the fact that The St. Paul began to switch to claims-made coverage in 1975, and 1976 was the last year in which new occurrence policies were written. Claims against the earlier occurrence coverage continued to be filed and closed throughout the subsequent decade. Because the data base on occurrence coverage was heavily weighted by the "run off" on old policies, the analysis of claim frequency was performed separately for claims-made and occurrence coverages.

49. NAIC Study, *supra* note 14.

TABLE A1
VARIABLE DEFINITIONS, MEANS, AND STANDARD DEVIATIONS

Variable	Mean	Standard Deviation	Definition
Time	5.71	2.847	Linear time trend, 1975 = 1
Surgical procedures per capita	.840	.092	Surgical procedures per 10,000 population
% Urban	.566	.243	Fraction of state population in urban areas
% Migrant	.212	.058	Fraction of state population changed county within 5 years
Unemployment rate	6.999	1.963	Unemployment rate
Income per cap (log.)	8.922	.271	Personal income, mean per capita (log.)
Attorneys per capita	.002	.003	Attorneys in active practice/population
Collateral source offset	.344	.469	= 1 if statute permitting or mandating collateral source offset
Panel	.419	.484	= 1 if statute establishing screening panel
Mandatory panel	1.057	1.33	= 1 if voluntary; 2 if mandatory, findings not admissible; 3 if mandatory, findings admissible
Mandatory collat. offset	.240	.484	= 1 if mandatory offset of any collateral coverages
Fee limit	.337	.467	= 1 if limit on plaintiff attorney fee
Arbitration	.234	.419	= 1 if statute permitting binding arbitration
CPI (log.)	5.434	.227	Consumer price index
% Over 65	.108	.018	Fraction of state population > 65
Surgeons per MD	.312	.024	Surgical specialists/total physicians in patient care
Cap	.204	.395	= 1 if any limit on plaintiff's recovery
Claims per physician (CM policies)	.165	.219	Claims filed/earned exposure
Paid claims per physician (CM policies)	.056	.114	Claims closed with payment/earned exposure
Severity (log.)	10.349	1.079	Total indemnity/paid claims

Data on tort reforms were compiled from several surveys of state statutes.⁵⁰ Original statutes were checked where there were discrepancies between the surveys. Most of the laws were measured as binary variables, taking the value of one in each year in which the law was in effect (even if under challenge), or zero if no change had been enacted or if a law had been

50. The main surveys are P. DANZON, *supra* note 5; AM. MEDICAL ASS'N, STATE HEALTH LEGISLATION REPORTS (1973-present); unpublished survey by Alliance of American Insurers (1985); Am. Ins. Ass'n, Medical Malpractice Insurance Reports (draft, Nov. 1981).

enacted but had subsequently been overturned. In the case of collateral source offset and screening panels, separate variables were used to identify mandatory and discretionary requirements. The statute of limitations was measured in years for filing for adults. In states with a discovery rule with no outer limit, the statute of limitations was arbitrarily assigned a value of ten.⁵¹ Table A1 lists all variables together with means and standard deviations.

B. Methodology

1. *System Issues.* Since the data consist of ten annual cross sections of over forty states, serial correlation of residuals is expected, reflecting unmeasured state-specific and possibly company-specific effects. State effects could include omitted legal and demographic factors that affect the filing and disposition of claims. Company effects could reflect specific claim handling or reporting practices of individual insurers. To control for company effects, dummy variables for individual companies other than The St. Paul were included. It was not feasible to include dummy variables for each state to capture omitted state effects, because of collinearity between these state dummies and the other independent variables which show little variation over the decade. Inclusion of measures of the frequency and severity of claims closed in 1975 to capture these state effects was attempted, but these variables were not statistically significant and did not reduce the serial correlation. Serial correlation of the residuals should not bias coefficient estimates, but standard errors may be downward biased and t-statistics may be upward biased.

The bias in standard errors depends on the correlation across years for each state (ρ), the length of the time period (T) and the fraction of the total variance in explanatory variables (X) attributable to variance between rather than within states.⁵² In the extreme, if the correlation of residuals within states across all years is a constant (i.e., between 1975 and 1976, as well as between 1975 and 1984), the corrections are fairly severe: if a variable is constant within states across all years, t-statistics must be divided by $\sqrt{1 + \rho(T-1)}$. For example, if $\rho = .4$ and $T = 10$, the correction is $\sqrt{1 + .4(9)} = 4.6 = 2.2$. For variables that change within states over the sample period, the correction is smaller and is given by (assuming constant ρ) $\sqrt{1 - \rho + (\rho T)(\sigma_B^2/\sigma_X^2)}$, where σ_X^2 is the total variance in X , σ_B^2 is the between-states variance in X and $\sigma_W^2 = \sigma_X^2 - \sigma_B^2$, where σ_W^2 is the within-states variance in X .

This upper bound of 2.2 probably overstates the appropriate correction for several reasons. First, all variables change at least once for at least some states. For background variables such as urbanization, 1975 values were used for the first five years and 1980 values for the last ten years, but true values presumably changed slightly in each year. For tort reforms, some states

51. A discovery rule tolls the running of the statute of limitations until the injury has been, or with due diligence should have been, discovered.

52. I am indebted to Emmett Keeler and Will Manning for this derivation.

changed once and some twice, if a reform was overturned. Second, p is presumably not constant over time but diminishes across years, with $p_{1,10} < p_{1,2}$. Such diminishing serial correlation was observed in similar data analyzed elsewhere.⁵³ For example, if the appropriate correction to reported t -statistics is 1.5, then an unadjusted t -statistic of 1.96 (significant at $p = .05$ by a two-tailed test) yields an adjusted t -statistic of 1.31. An adjusted t -statistic of 1.31 would be significant at $p = .1$ by a one-tailed test, which is the appropriate test for most variables. The unadjusted t -statistic necessary for significance by a one-tailed test would be 2.47 for $p = .05$, 1.92 for $p = .1$. If the estimated, unadjusted t -statistics are also subject to downward bias because of measurement error in the explanatory variables, then the null hypothesis for most variables using conventional significance levels for a two-tailed test should not seriously overstate true levels of significance.

To the extent tort reforms were more likely in states with an underlying propensity for high claim frequency and severity that is not attributable to other measured variables, ordinary least squares (OLS) estimates of the impact of those reforms may be biased. For laws expected to reduce claim frequency or severity, the bias from ignoring simultaneity leans toward finding no effect even when the true effect is negative. Both OLS and two-stage least squares (TSLS) estimates were therefore reported. Instruments used in the first-stage estimating equations for the laws were: total claim frequency, paid claim frequency, severity per paid claim, number of claims paid more than \$100,000, attorneys per capita, and physicians per capita. All values were for 1975.

2. *Functional Form.* Logarithmic transformation of the dependent variables are used, on the assumption that changes in law are likely to have a proportional effect on claim frequency and severity. For claim frequency, equations using the logistic transformation of claims per physician were also reported for the claims-made experience.⁵⁴ This transformation was not used for the occurrence experience because of difficulty in constructing a meaningful measure of the physician exposure base—claims per physician on a calendar year basis—for occurrence coverage.

2. *Weighting.* Each observation represents the average experience of the physicians insured by the participating companies in each state. Heteroscedasticity due to differences in the number of insureds was anticipated. For severity per paid claim, each state-year observation was therefore weighted by the number of paid claims in that state in that year. For frequency of claims filed or closed, the appropriate weight is some function of the number of physician-years in the exposure base. However, measuring exposure is not simple. In the case of claims-made coverage, exposure in

53. P. DANZON, *supra* note 5, at 21.

54. The rationale for this transformation is given in P. DANZON, *supra* note 5, at 17.

theory depends on the number of physicians written in the current policy year and the maturity of their claims-made coverage, since the policy covers claims filed in the policy year arising out of practice in prior years in which the physician was insured. In practice, since the average number of prior years of coverage was not known, physician exposure in the policy year is used as the weight, and the number of physicians insured in previous years is included as an explanatory variable. For occurrence coverage, the ideal weight is again a weighted average of exposure in several prior years. The available data base consists primarily of the development of the pre-1977 St. Paul occurrence coverage, with no new exposure in later calendar years, but also includes a few other companies with growing exposure over time. Thus, there is no simple measure of exposure in each calendar year. Occurrence frequency equations were therefore unweighted and exposure in current and prior years were included as explanatory variables.

277-4864

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Mary A. Pierce
Executive Director
Medical Indemnity Corporation of Alaska
4000 Old Seward Highway, Suite 203
Anchorage, Alaska 99503

Re: Effective Tort Reform Legislation

Dear Ms. Pierce:

You, like many other executive officers of medical societies and physician sponsored insurers, are likely involved in continuing efforts to obtain passage of effective tort reform.

At the May 1988 Physician Insurers' Association of America Annual Meeting I had the opportunity to discuss the importance of the "fine print" in tort reform legislation. So many people in the audience requested copies of my slides that I prepared the attached annotated version of those slides.

The information on pages two through four can be used as a checklist in reviewing tort reforms you may be considering. Actuarial techniques can be used to evaluate how much "fine print" in the tort reform language might affect the value of the reforms.

If you have any questions about this material, or if I can be of any other assistance to you, please feel free to call me or my associate, Spencer Gluck.

Very truly yours,

RECEIVED

Allan Kaufman, F.C.A.S.

AUG 15 1988

MICA

AK/pr
cc: D. Bickerstaff

How Effective is Tort Reform?

Read the Fine Print

Tort reform can work.

The largest "laboratory" to date has been the medical professional liability system in California. Here, a package of tort reforms including many of the currently popular elements was passed following the mid-seventies medical malpractice insurance crisis. At that time, California joined New York and Florida among the national leaders in medical liability costs. Today, California's medical liability costs are far closer to the national average.

Patricia Danzon, currently at University of Pennsylvania, compared medical liability costs from 1975 to 1984 in a number of states with and without tort reforms, calculating these average savings associated with various types of tort reforms:

Caps on non-economic loss	23%
Collateral sources offsets	11-18%
Contingency fees limitations	3%
Reduced statute of limitations	8% per year
Structured settlements	Not tested
Joint & Several Liability	Not tested

Of course, these estimates of savings are in comparison to what costs otherwise would have been, and represent average results for the states studied.

Remember, successful tort reform means that costs are lower than they otherwise would have been. It is unlikely that tort reform will produce costs below the starting point for an extended period.

Tort reform can also fail.

Or be relatively ineffective. Or be less effective than it might have been. For each of the types of reform listed above, there have been a number of variations in bills which have passed, and even more in bills which have been considered. Small differences in wording can have profound implications, some of which may be unintended. To evaluate an existing or proposed tort reform, be sure to read the "fine print".

We've worked on many variations of tort reforms in proposals, bills, and laws in a number of states. The following list illustrates some of the possible variations and important factors which affect the value of those reforms. The list begins with a ball-park estimate of the savings which the reforms might produce for medical professional liability.

Limitations on Non-Economic Loss

Estimated savings can range from zero to fifty percent, depending on:

1. Amount of Limitation. Proposals range from complete elimination to a \$1,000,000 limitation.
2. Per Incident or Per Claimant. This distinction is significant, but without proper attention the wording of the law may not even be clear.
3. Flat or Graded. Flat limitations are more common. Grade limitations usually apply the maximum to only the most serious cases and then grade the limitation down for less serious cases (e.g. in proportion to "capacity to enjoy life").
4. Definition of Non-Economic Loss. For example, future wage loss in one jurisdiction is considered speculative and therefore non-economic.
5. Variation by Claimant Characteristic. For example, the limitation may vary by age of claimant and/or degree of injury.
6. Indexation of the Limitation for Inflation.

Collateral Source Offsets

We've estimated savings in this area from zero to fifteen percent.

1. Mandatory or Judgmental Offset. Possible wordings include: "evidence may be introduced"; "judge/jury may consider"; or "judge/jury shall reduce".
2. Offset by Judge or Jury. There's opinion (although no evidence) that offset by the judge produces greater savings.
3. Exceptions to Offset. Possibilities include medicare, life insurance, public insurance, insurance paid by claimant, insurance with subrogation provisions, insurance paid by employer.

4. Past Damages Only or Past and Future Damages. The language of a number of current laws appears to apply to past damages only, whether or not this was intended when the law was written.
5. Offset for Premium Paid by Claimant.

Contingency Fee Limitations

Estimated savings range from zero to ten percent.

1. Selected Schedule. Most limitations take the form of some kind of schedule. That schedule may include percentages higher than current prevailing fees.
2. Schedule Variations. Most schedules vary the percentage by size of award. Others may also vary the percentage by case disposition (i.e., claim, suit, trial, appeal).
3. Treatment of expenses. Are trial, court and expert fees counted as part of the schedule or in addition to the schedule fee? Alternatively, is the award/settlement reduced by expenses before the fee is applied?

Statute of Limitations

We've estimated savings ranging from zero to fifteen percent.

1. Cutoff Period. We've seen anywhere from two years to ten years.
2. Cutoff by Occurrence Date or Discovery Date. Another possibility is both, e.g. "four years from incident or two from discovery, whichever is later".
3. Definition of Discovery Date. "Did discover" or "could have discovered" or "should have discovered" etc.
4. Statute of Repose or Statute of Limitations. A statute of repose operates more restrictively. The courts may decide which it is; careful wording in the law can cause it to operate as a statute of repose.
5. Exceptions. The potential list includes infants, foreign objects, continuing treatment, drugs or radiation, and concealment or fraud.

Periodic or Structured Settlements

Estimated savings range from zero to ten percent.

1. Optional or Mandatory.
2. Size Requirements. For example, "awards over \$250,000" or "awards with future damages over \$100,000".
3. Applied to Economic Loss, Non-Economic Loss, or both.
4. Treatment of Inflation. Examples include inflation calculated at the jury's discretion, at a fixed rate specified by statute, or at a fixed relationship with a stated index.
5. Court Rules on Treatment of Inflation and Interest. This item refers to conditions before the change in law. Previous assumptions regarding inflation and interest may have been specified in statute or in case law. In other instances it may be difficult to determine prevailing assumptions.
6. Payment Periods. Possibilities include a specified payment period (e.g., 10 years), a specified maximum payment period, payment for life expectancy.
7. Payments May or May Not Terminate at Death. Frequently, some payments terminate (e.g., medical costs) while others may not (e.g., wage loss).
8. Financial Guarantees Required. For example, insurer with specified Best's rating.
9. Treatment of Attorney's Fees. In some instances, attorney's fees may be completely exempted from periodic payments. Other possibilities include lump-sum payments with required present value calculations or separate rule for scheduled payments.

Joint and Several Liability

We haven't estimated significant savings to doctors in this area.

1. Economic Versus Non-Economic Losses. A number of existing versions abolish joint and several liability for non-economic losses only.
2. Proportionate Liability in All Cases or Only Below A Threshold. For example, some laws establish proportionate liability for those under 50% liable, but provide that all damages may be assessed against those over 50% liable.

3. Among Whom are Damages Apportioned. For example, in a case involving a work-related injury, may the employer be included?

* * * *

Summary and Conclusion

There is evidence that tort reform can be an effective means for reducing the growth in liability costs. Still, simply passing a tort reform bill by no means ensures that savings will be realized. It is no accident that we included zero in each possible range of results. Some versions of tort reform may even increase costs. The fine print of the law, the court instructions used to implement the law, and court interpretations of the law will all act to determine the effectiveness of a tort reform measure. An important first step is to read the fine print.

STUDY: TORT REFORM "ONLY IDENTIFIABLE FACTOR" IN LOWER RATES

A study of mature claims-made premiums charged by 46 physician-owned professional liability companies, released late in 1987, reveals that premiums charged by all four of the MD-owned carriers in the state are substantially lower than those in other populous states, and lower than some less populous states.

"This data provides further concrete evidence that California's tort reform measures are working," says Ron Neupauer, underwriting manager for Medical Insurance Exchange of California, which conducted the study.

"California is unique among populous states because of MICRA (Medical Injury Compensation Reform Act)," Neupauer said.

Quality of care and practice patterns are not different in this state and the legal climate and liberal appellate court decisions all would tend to drive up professional liability claims costs and premiums as they have in other states, Neupauer said.

"MICRA appears to be the one identifiable California only factor which has contributed to its lower rates," he theorized.

Neupauer said that 12 years ago, California's premiums were among the highest. Now the differences are dramatic.

"An obstetrician would pay as much as \$152,881 in Miami, compared to \$45,868 in Los Angeles. Obstetricians' rates in Michigan, Maryland

INTERNAL MEDICINE

	A	B
1	MICH (MPMLC)	\$19,279
2	NEW YORK	\$18,533
3	FLORIDA (FPIC)	\$17,402
4	FLORIDA (FPIT)	\$14,790
5	FLORIDA (PPTF)	\$14,667
6	ALASKA (MICA)	\$12,030
7	MARYLAND	\$11,725
8	ALASKA (MIEC)	\$11,256
9	MICH (PICOM)	\$10,223
10	NEVADA	\$9,480
11	ILLINOIS	\$9,020
12	ARIZONA	\$8,248
13	MISSOURI (MMIC)	\$7,932
14	HAWAII	\$7,629
15	NEW JERSEY	\$7,436
16	PENNSYLVANIA	\$7,234
17	WYOMING	\$6,156
18	OHIO (PICO)	\$5,909
19	CALIF (MIEC)	\$5,908
20	GEORGIA	\$5,898
21	CALIF (DOCTORS)	\$5,896
22	CALIF (SCPIE)	\$5,864
23	MONTANA	\$5,788
24	MISSOURI (MDA)	\$5,522
25	MAINE	\$5,414
26	CALIF (NORCAL)	\$5,412
27	DIST COLUMBIA	\$5,365
28	TENNESSEE	\$5,340
29	TEXAS (TMLT)	\$5,256
30	CONNECTICUT	\$5,254
31	OREGON (NPMIC)	\$4,951
32	WASHINGTON	\$4,756
33	IDAHO	\$4,740
34	WISCONSIN	\$4,189
35	KENTUCKY	\$4,156
36	ALABAMA	\$4,124
37	LOUISIANA	\$4,032
38	IOWA	\$3,700
39	COLORADO	\$3,660
40	NORTH CAROLINA	\$3,427
41	MINNESOTA	\$3,181
42	NEW MEXICO	\$3,104
43	UTAH	\$3,071
44	MISSISSIPPI	\$2,659
45	OKLAHOMA	\$1,751
46	INDIANA 100/300	\$1,356

OBSTETRICS/GYNECOLOGY

	E	F
1	FLORIDA (FPIC)	\$152,881
2	FLORIDA (FPIT)	\$137,399
3	FLORIDA (PPTF)	\$134,496
4	MICH (MPMLC)	\$124,685
5	MARYLAND	\$99,244
6	NEW YORK	\$94,113
7	ALASKA (MIEC)	\$76,536
8	MISSOURI (MMIC)	\$67,419
9	MICH (PICOM)	\$66,412
10	NEVADA	\$64,448
11	ALASKA (MICA)	\$64,253
12	ARIZONA	\$57,062
13	MISSOURI (MDA)	\$55,804
14	HAWAII	\$51,360
15	TEXAS (TMLT)	\$50,278
16	DIST COLUMBIA	\$43,280
17	PENNSYLVANIA	\$48,196
18	CONNECTICUT	\$47,521
19	GEORGIA	\$46,791
20	ILLINOIS	\$46,648
21	CALIF (SCPIE)	\$45,868
22	COLORADO	\$42,644
23	WYOMING	\$42,172
24	OREGON (NPMIC)	\$41,062
25	OHIO (PICO)	\$40,377
26	CALIF (DOCTOR)	\$40,368
27	IDAHO	\$40,250
28	CALIF (MIEC)	\$40,156
29	CALIF (NORCAL)	\$40,136
30	MAINE	\$40,115
31	MONTANA	\$39,660
32	ALABAMA	\$37,267
33	WASHINGTON	\$36,329
34	KENTUCKY	\$34,117
35	UTAH	\$32,938
36	IOWA	\$31,828
37	NEW JERSEY	\$31,476
38	WISCONSIN	\$31,412
39	LOUISIANA	\$29,235
40	NORTH CAROLINA	\$28,626
41	MISSISSIPPI	\$22,768
42	TENNESSEE	\$20,992
43	MINNESOTA	\$18,640
44	NEW MEXICO	\$16,153
45	INDIANA 100/300	\$11,526
46	OKLAHOMA	\$11,393

GENERAL SURGERY

	C	D
1	FLORIDA (FPIC)	\$91,730
2	FLORIDA (PPTF)	\$30,698
3	MICH (MPMLC)	\$73,961
4	FLORIDA (FPIT)	\$68,538
5	MARYLAND	\$55,621
6	NEW YORK	\$53,295
7	MISSOURI (MM)	\$51,557
8	PENNSYLVANIA	\$45,635
* 9	ALASKA (MIEC)	\$40,520
10	MICH (PICOM)	\$39,549
* 11	ALASKA (MICA)	\$37,585
12	MISSOURI (MD)	\$34,601
13	ARIZONA	\$34,272
14	NEVADA	\$34,120
15	OHIO (PICO)	\$33,327
16	CALIF (SCPIE)	\$33,024
17	ILLINOIS	\$31,256
18	CONNECTICUT	\$29,700
19	KENTUCKY	\$28,494
20	TEXAS (TMLT)	\$28,360
21	GEORGIA	\$28,308
22	HAWAII	\$27,458
23	MAINE	\$27,059
24	DIST COLUMBIA	\$26,823
25	OREGON (NPMI)	\$26,504
26	NEW JERSEY	\$25,208
27	COLORADO	\$24,356
28	CALIF (NORCAL)	\$24,024
29	WASHINGTON	\$23,965
30	WYOMING	\$22,950
31	CALIF (DOCTOR)	\$21,380
32	MONTANA	\$21,500
* 33	CALIF (MIEC)	\$21,250
34	LOUISIANA	\$21,185
35	ALABAMA	\$20,934
36	IOWA	\$19,908
37	UTAH	\$19,755
38	WISCONSIN	\$18,951
39	IDAHO	\$17,052
40	MINNESOTA	\$15,609
41	MISSISSIPPI	\$15,192
42	NORTH CAROLINA	\$15,182
43	TENNESSEE	\$15,096
44	NEW MEXICO	\$12,534
45	OKLAHOMA	\$8,702
46	INDIANA 100/3	\$7,119

NEUROSURGERY

	G	H
1	FLORIDA (PPTF)	\$170,363
2	MICH (MPMLC)	\$159,190
3	FLORIDA (FPIC)	\$152,881
4	FLORIDA (FPIT)	\$137,399
5	NEW YORK	\$115,240
6	MARYLAND	\$100,118
* 7	ALASKA (MICA)	\$89,809
* 8	ALASKA (MIEC)	\$76,536
9	MICH (PICOM)	\$73,128
10	MISSOURI (MMIC)	\$71,390
11	PENNSYLVANIA	\$69,877
12	NEVADA	\$64,448
13	ILLINOIS	\$63,752
14	ARIZONA	\$59,744
15	GEORGIA	\$58,855
16	MISSOURI (MD)	\$55,804
17	OHIO (PICO)	\$53,835
18	TEXAS (TMLT)	\$53,303
19	DIST COLUMBIA	\$52,903
20	HAWAII	\$51,860
21	KENTUCKY	\$48,577
22	MAINE	\$47,948
23	CONNECTICUT	\$47,521
24	LOUISIANA	\$46,606
25	OREGON (NPMIC)	\$44,540
26	CALIF (NORCAL)	\$43,976
27	UTAH	\$43,862
28	NEW JERSEY	\$41,698
* 29	CALIF (MIEC)	\$40,156
30	WYOMING	\$39,972
31	IOWA	\$39,820
32	WISCONSIN	\$39,796
33	CALIF (SCPIE)	\$38,964
34	COLORADO	\$38,584
35	CALIF (DOCTORS)	\$37,260
36	WASHINGTON	\$38,150
37	MONTANA	\$37,596
38	ALABAMA	\$37,267
39	IDAHO	\$32,208
40	NORTH CAROLINA	\$31,515
41	MISSISSIPPI	\$30,388
42	TENNESSEE	\$22,511
43	MINNESOTA	\$19,470
44	NEW MEXICO	\$16,158
45	INDIANA 100/300	\$11,526
46	OKLAHOMA	\$11,393

and New York also are at or over the \$100,000 threshold," he said.

Subsequent success in California in enacting and upholding such tort reforms as caps on non-economic damages, limits on contingent fees, periodic payment of future damages, and collateral source rule changes all have contributed to the moderation of doctors' premiums. This should provide sound support for similar reforms in other states, Neupauer suggested.

In looking at the data collected, Neupauer pointed out that in some states, rates would be higher but for the intervention of state regulatory agencies, which in some cases may imperil certain companies' solvency.

"Claims that these insurance companies are 'profiteering' or overcharging are insupportable," he concluded.

NEXT MONTH: A report on proposed rates sought by some commercial carriers. Also, an update on tort reform and a surprising report from the United Kingdom.

The study of doctor-owned companies premium comparisons includes four representative specialties. It shows premiums for \$1 million limit coverage except for Indiana, Michigan and Wisconsin where only lower limits are offered, and Ohio, where the limit is \$1.4 million. It is reprinted with permission of MIEC.

Medical Liability Monitor

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Number 8

ANALYSIS OF LATEST MD-COMPANY PREMIUM INCREASES REFLECTS TRENDS

Are medical insurance premiums finally leveling off? MLM's 1988 mid-year national survey of physician-owned companies reveals that premiums increased this year about 10% on average. Seventeen including four in California, reported no increases or increases less than 10%. Largest increases were reported by American Physicians Insurance Exchange of Texas (49.8%); Arizona (34.6%); Colorado (28.3%); Alaska (23.0%) and Georgia (21%).

Significant state tort reforms and a nationwide decline in the number of new claims filed in several regions may have contributed to the lower premium increases. The relatively modest overall increases, however, will nevertheless add some \$150 million to the aggregate annual insurance bill for some 170,000 physicians insured by these companies.

Next month MLM talks with some doctor-company leaders to find out whether this is a temporary or permanent downtrend--and why.

MLM 1988 MEDICAL MALPRACTICE INSURANCE RATE SURVEY

Doctor-companies offering \$1 million or more coverage

STATE/COMPANY	DATE CHANGE	PERCENTAGE INCREASE
Alabama	8/88	21.4 (Request filed)
Alaska	1/88	23.0
Arizona	4/88	34.6 (Request filed)
Arkansas	1/88	15.4
California		
MIEC	8/88	None
MORCAL		None
SCPIE	1/88	8.3
DOCTORS	4/88	None
Colorado	1/88	28.3
Connecticut	10/87	17.2
Dist. of Columbia	6/88	None (New renewal date: 1/1/89)
Florida		
FPIC	1/88	.5
FPIT	1/88	18.0
Georgia	5/88	21.0
Illinois	7/88	7.0
Iowa	2/88	17.7
Kentucky	4/88	10.0
Louisiana	7/88	None
Maine	9/87	25.0
Maryland	7/88	None (New renewal date: 1/1/89)
Michigan		
MIMIC	4/88	9.8
Minnesota	1/88	8.0
Mississippi	1/88	15.0
Missouri		
MONEDICO	9/87	15.0
New Jersey	2/88	None
New York	7/88	5.0
North Carolina	2/88	9.5
Ohio	8/88	10.0 (Request filed)
Oklahoma	1/88	5.0
Oregon	1/88	10.0
Tennessee	5/88	5.6
Texas		
APIE	1/88	49.8
Utah	12/87	4.5
Washington	1/88	9.0

Several physician-owned companies do not write coverage at \$1 million or more levels. They are not included in this report.

KANSAS PHYSICIANS, LAWYERS OFFER MODEL BILL... (Cont. from page 1)
panel conclusions strongly persuasive in determining the presence or absence of injury, the presence or absence of sub-standard practice, and the presence or absence of causation of such injury by substandard practice," the Kansas cardiovascular surgeon said.

Appeals from board decisions within the scope of the act go to state district courts and appellate courts, which must "act expeditiously by giving preference to the consideration of com-

MD firm rate survey...pp.2-3
PIE moves into MO.....p.4
New bill, OTA report....p.4
Checking competency.....p.5
Cadet diagnosis delay...p.6

two or three providers, are convened as needed to help the board evaluate claims."

"Although the board can make decisions independently, it is mandated to

FLORIDA INSURANCE COMMISSIONER ANNOUNCES FOR U.S. SENATE

It never was a secret that Florida Insurance Commissioner Bill Gunter had political ambitions. He now has announced that he will run for the U.S. Senate seat held by retiring Lawton Chiles. He will post-date his resignation until January, 1989, to prevent the Republican governor from appointing his successor.

PIE MUTUAL EXPANDS WESTWARD INTO MISSOURI; SEES RIGHT MIX

PIE Mutual Insurance Company, Cleveland, OH, has announced that it has been authorized to offer professional liability insurance to Missouri physicians through independent agents, beginning this month. PIE writes medical protection for 8,000 physicians, surgeons and dentists in Ohio, West Virginia and Kentucky.

"Missouri offers us the mix of ingredients which have worked well for our physicians in other states," said Larry E. Rogers, PIE's president and CEO. "The state has more than 11,000 physicians in a sophisticated medical community with a good track record of controlling costs."

The company will offer up to \$7.2/\$7.6 million in modified claims-made coverage. Rates have not yet been finalized.

CONGRESSIONAL BILL REPORT FOCUS ON QUALITY CARE MEASURES

Congress currently appears to be taking a long and positive look at ways of improving the quality of medical care available to consumers.

Seeking to facilitate effective emergency medical treatment on certain commercial flights, Rep. William Broomfield (R-MI) has introduced legislation that would enable a physician to render care to a fellow passenger suffering a heart attack or similar life-threatening condition without fear of a malpractice suit.

HR 4924, entitled the In-Flight Medical Emergency Assistance Act, would free a licensed MD from constraining malpractice liability when treating an in-flight emergency.

In addition, the Congressional Office of Technology Assessment last month issued a report offering possible guidelines that individuals and organizations can use to evaluate the quality of health care. Some yardsticks for measuring quality have become necessary, said Rep. James Scheuer (D-NY) in introducing the report, because of recent changes in physician and hospital reimbursement to hold down health costs.

"These payment changes have raised concerns that physicians and hospitals facing restricted budgets and low payment rates will skimp on services to the detriment of patients' health and that third-party payors will seek low cost providers with not enough regard for their quality of care," Rep. Scheuer, Chairman of the House Subcommittee on Natural Resources, Agriculture, Research and Environment, said.

OTA evaluated many possible quality care indicators and concluded that these were best: formal disciplinary actions by state medical boards; hospital accreditation standings; physicians practicing within the confines of their training; hospital mortality rates; adverse events, such as hospital-acquired infections; and sanctions imposed by the Department of Health and Human Services based on recommendations of peer review organizations. Amount of malpractice compensation also may be an indicator. Consumers' own ratings also have good validity, the report said, but patients should combine information from more than one indicator and draw information from more than one year. OTA also said high priority should be given to identifying and improving below-par performance of MDs and hospitals.

THE IMPACT OF TORT CHANGES ON INSURANCE RATES

"It is clearly impossible to say that if you adopt a certain tort reform, you will get 'X' reductions in premiums."

— Franklin W. Nutter, 3/86

President, Alliance of American Insurers

In early 1986 the insurance industry launched a multi-million dollar media campaign proclaiming a "lawsuit crisis." The crisis, industry representatives claimed, was driving up insurance rates and forcing the cancellation of coverage. To solve the problem, the industry called upon lawmakers to make radical changes in the civil justice system.

But when asked by consumer advocates, legislators, and insurance commissioners, whether their proposals to limit victims' compensation will bring down insurance rates or ease availability, insurance industry executives reply that it's impossible to say.

In December 1986, the National Insurance Consumer Organization (NICO) released documents prepared by State Farm Fire and Casualty Company, Great American West, and the Insurance Services Office, which demonstrate that limiting tort laws would have little or no effect on rates. State Farm told the Kansas Insurance Department that restricting joint and several liability and limiting punitive damages would have no impact, while capping damages for pain and suffering would reduce rates by no more than one percent.

The Florida Experience

The best evidence of the negligible impact of tort changes on insurance rates has been provided by two of the leading liability insurers in the country.

In the summer of 1986, the Florida legislature enacted several restrictions limiting compensation to injured victims. These restrictions included: restricting joint and several liability (the liability of more than one wrongdoer causing the same harm), capping compensation for non-economic damages, such as disfigurement and sterility, and limiting punitive damages.

In August, the Aetna Life & Casualty Company and the St. Paul Company filed documents with the Florida insurance commission concluding that these limitations on victims' rights will have no effect on insurance rates.

More recently in Florida, over 100 companies have told the Florida Insurance Department that the tort limits passed by the legislature will reduce liability premiums by an average of only one percent.

At the same time, insurers in Florida are increasing medical malpractice premiums by 25 to 35 percent.

Similar Actions in Other States

Not surprisingly, the experience of other states which passed restrictions on compensation in 1986 has been similar to Florida's. For example:

- After the Washington state legislature approved a cap on non-economic damages, insurers sought substantial but unjustified rate increases. They were rejected by the insurance commission.
- After Colorado enacted a \$250,000 cap on non-economic damages as well as other "reforms," the Hartford Insurance Company announced it would start cancelling current malpractice policies in 1987. This led Republican legislators to charge that "the insurance industry deceived the legislature when it pushed the reforms as dealing with the liability crisis."
- In Maryland, the state's major medical malpractice insurer was granted a fifty percent rate increase only months after successfully lobbying for a \$350,000 cap on non-economic damages.

The Ontario Experience

Most tort changes the industry is seeking in the U.S. — including caps, restrictions on punitive damages, and the prohibition of contingency fees — are currently the law in Ontario, Canada. Yet the insurance industry in Canada has raised some premiums by 400 percent or more, cancelled coverage in mid-term, and refused to provide coverage at any price in some cases.

Who Benefits?

Wrongdoers and insurance companies are the only beneficiaries of proposals to limit citizens' rights to use the courts. In no state are there either requirements or hard promises that any of the savings will go to insurance consumers.

The real way to lower rates and increase the availability of insurance is meaningful insurance reform — not cutbacks in the rights of citizens under the civil justice system.

THE NEED FOR INSURANCE REFORM

In 1984 Americans spent \$287 billion, or over 11 percent of their disposable income—on insurance. The cost and availability of insurance has a significant impact on our work, our homes, and our recreation. Yet, remarkably, the insurance industry operates largely outside of the public eye.

Through its enormous power and influence, the insurance industry has gained unprecedented special privileges. The federal government provides virtually no regulation or oversight of the industry. Among the privileges the industry enjoys are:

- exemption from anti-trust laws, which prevent price-fixing;
- exemption from scrutiny by the Federal Trade Commission;
- exemption from disclosing even the most basic information on its income and payouts on different types of insurance.

The federal government has left the job of regulating insurance companies to the states—with mixed results. State insurance commissioners are typically underfunded and understaffed. Few even employ an actuary! Many have developed "cozy" relationships with the industry they are supposed to regulate. (Half of all insurance regulators come from or return to the industry, according to the General Accounting Office.) Consumer interests have been poorly represented in the insurance rate and policy making process.

Consumers, small businesses, non-profit organizations, and others are now paying the price for the insurance companies' free reign: staggering increases in the cost of liability insurance, unjustified cancellation of policies, and an assault on the rights of innocent victims to receive just compensation for injuries caused by defective and dangerous products.

The solution to the so-called "insurance crisis" is more effective regulation of the insurance industry. Reforms aimed at making the industry more accountable to consumers will control its short-sighted underwriting practices, its mismanagement, and its historical boom and bust cycle.

WHAT CONGRESS SHOULD DO

Enact Disclosure Legislation or "Sunshine Laws."

Disclosure legislation should require the insurance industry to submit, on a sub-line by sub-line, insured by insured basis, the amount it pays out in claims compared to its premium and investment income. The analysis of such data, which the industry currently refuses to disclose, is essential to determine the true financial condi-

tion of the industry, as well as the likely effect of tort law restrictions on injured people and on insurance rates.

Repeal Industry's Special Exemptions.

The McCarran-Ferguson Act, which exempts insurance companies from anti-trust laws and allows them to fix prices, should be repealed. Moreover, Congress should direct the Federal Trade Commission—currently prohibited from even studying the industry—to review the prices, coverage, and underwriting practices of the industry.

Regulate Foreign Reinsurers and Create Alternatives.

Much reinsurance (insurance for insurance companies) is written by foreign companies such as Lloyds of London. Free from any American or foreign regulation, these companies often demand arbitrary cancellation of coverage or premium increases. Because of their tremendous impact on the American insurance market, foreign reinsurers should be subjected to regulation to ensure that their underwriting decisions are in the public interest.

Furthermore, since U.S. insurers currently have no effective recourse when Lloyds raises its rates, as it did in 1985, a federal reinsurance program should be established to compete with Lloyds and help bring down rates. Such a program was very successful during the "insurance crisis" of the 1960's.

Create a Federal Office of Insurance.

Nationally, insurance is a \$310 billion business, accounting for 12% of our gross national product. Yet only the states regulate the industry. For a number of reasons, state regulation has not always protected the public. A federal office of insurance would monitor the industry and establish standards for state regulators to follow.

WHAT STATES SHOULD DO

Require Experience-Rating.

Good drivers pay less than bad drivers for auto insurance, and homeowners who are good risks pay less than those who are bad risks. But many professionals (such as doctors) and businesses pay a set rate regardless of their individual claims experience, i.e., they are not experience-rated.

By requiring insurance companies to experience-rate all professional and commercial risks, just as they experience-rate drivers and homeowners, states could reduce insurance rates for most insureds.

Improve State Regulation.

State insurance commissioners must be provided enough personnel, particularly actuaries, to effectively

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analyze and regulate insurance rates. Strong conflict-of-interest laws, preventing the "revolving door" of government-industry turnover, and subpoena power for state insurance administrators are essential.

Increase Consumer Representation before Regulatory Bodies.

Typically, only regulators and insurance companies participate in rate cases. Citizens' Insurance Boards and Offices of Public Advocate should be established to provide for consumer representation and participation in rate cases.

Prohibit Arbitrary Cancellations.

Under current law in most states, insurance companies may cancel a policy at any time, without notice, for any

reason or for no reason at all. It is fundamentally unfair for a policyholder who has entered into an insurance contract for a specified term to suddenly find that contract cancelled before the term ends. States should enact legislation that would prohibit midterm cancellation unless the policyholder has engaged in fraud, has failed to pay his or her premiums, or if there has been a change in the underlying risk.

Prior Approval of Rate Increases.

Insurance companies should be required to obtain approval of state insurance commissions prior to adopting rate increases. This would dampen the erratic pricing cycles of the industry. Flex rating with a narrow band of automatic approval is a possible alternative.

WHAT PEOPLE ARE SAYING ABOUT LIABILITY INSURANCE AND VICTIMS' RIGHTS

"We are witnessing a multi-million dollar advertising and public relations hoax — a fraud financed by the insurance industry seeking to enrich its already huge profits at the expense of innocent victims. Its chief beneficiaries are the perpetrators of harmful products, hazardous chemicals and dangerous conditions in the workplace and environment."

— *Ralph Nader*

On the Consumer Benefits of the Civil Justice System

"Civil justice is one of the great triumphs of the American system. It allows any person, regardless of their resources, to challenge the largest corporate or government power and receive compensation for wrongful injuries. It forces wrongdoers to change their products and practices or risk further liability. It forces public disclosure of defective products and dangerous practices. The civil justice system must be preserved and the rights of consumers protected. The public interest demands no less."

— *Joan Claybrook, President of Public Citizen, before the Commerce, Transportation and Tourism Subcommittee of the House Committee on Energy and Commerce, 5/21/86*

"Where product liability has had a notable impact — where it has most significantly affected management decision making — has been in the quality of the products themselves. Managers say products have become safer, manufacturing procedures have been improved, and labels and use instructions have become more explicit."

— *Nathan Weber, author of The Conference Board's 1987 report, "Product Liability: The Corporate Response," based on a survey of the risk managers of 232 major corporations*

On the "Lawsuit Crisis"

"The explosion in liability lawsuits is nothing but a myth."

— *Business Week, 4/21/86*

Today as in 1976, the insurance industry blames the legal system for huge premiums. Their implausible claim is that judges and juries became generous in 1976, stingy for the next eight years and inexplicably generous again."

— *Robert Hunter, President, National Insurance Consumer Organization, New York Times, 4/13/86*

"Compare the estimated \$28 to \$35 billion spent in 1985 on tort litigation to the \$32 billion Americans spend on tobacco each year, or the \$60 billion spent on alcohol products each year, or the \$80 billion gross income earned by doctors each year."

— *Ralph Nader, before the Economic Stabilization Subcommittee of the House Committee on Banking Finance and Urban Affairs, 8/6/86*

"Our studies do not support any claim of recently escalating jury awards."

"A number of highly publicized news articles quoting our statistics have grossly misstated them."

— *Philip J. Hermann, Chairman of the Board, Jury Verdict Research, before the Economic Stabilization Subcommittee of the House Committee on Banking Finance and Urban Affairs, 8/6/86*

"Not only is the evidence missing to indicate a significant national increase in filings above the increase in population, but in a number of state courts, selected civil filings have decreased between the period 1981-1984."

"Changes in the number of these filings [tort, contract, real property rights and small claims] are not attributable to an increase in the propensity of Americans to sue, but rather to an increase in the number of Americans."

"The existence of any litigation explosions has been cyclical, and there is no evidence to support the notion of a continuing nationwide increase in lawsuits in the state trial courts between 1981-1984."

— *Robert Roper, Director, Court Statistics and Information Management Project, National Center for State Courts, before the Economic Stabilization Subcommittee of the House Committee on Banking, Finance, and Urban Affairs, 8/6/86*

"Not surprisingly, a jury of peers tends to increase awards over time by no more than the rise in medical costs, general inflation and the value of lost work. Recent changes in average jury awards and numbers of lawsuits filed mirror increases in average wages, medical costs, life expectancy and population growth."

— *Dr. Mark Cooper, author of the 1986 Consumer Federation of America report, "Trends in Liability Awards: Have Juries Run Wild?"*

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On the Relationship Between Tort Reforms and Insurance Prices

"It is clearly impossible to say that if you adopt a certain tort reform, you will get 'X' reduction in premiums."

— *Franklin W. Nutter, President, Alliance of American Insurers, 3/86*

"If legislators agree to sacrifice some of their constituents' rights, they ought to come away with something more than the insurance industry's gratitude and promises of future financial support."

— *Miami Herald, 5/5/86*

"There is little evidence that making the changes in the tort system proposed by the federal government and the insurance industry will prevent a similar 'crisis' in the future given the cyclical nature of the insurance industry."

— *National Association of Attorneys General Ad Hoc Committee on Insurance in its May 1986 report, "An Analysis of the Causes of the Current Crisis of Unavailability and Unaffordability of Liability Insurance"*

"How can an industry that spends millions on advertising and contributes heavily to state and federal campaigns to reform tort law not recognize the public relations debacle associated with telling a state, which reformed its tort law, that the reforms are worth zero in the pricing of insurance products?"

— *Journal of Commerce, 10/24/86*

On the Financial Condition and Mismanagement of the Insurance Industry

"The property and casualty industry must accept the major responsibility for its current financial condition."

— *Insurance Services Office, NAI, "1985: A Critical Year"*

"[W]e've seen seven cycles since 1900. . . . [They] involve price, coverage and marketing concessions and the aftershock of needed quick price increases to undo the damage of these highly competitive periods."

— *John H. Bretherick, President of Continental Corp., National Underwriter, 11/21/86*

"Just as surely as night follows day, there will be another period of vigorous price competition when results improve. The insurance industry is its own worst enemy."

— *Thomas B. Hagen, President of Erie Insurance Group, Best's Review, 6/86*

"The property/casualty insurance industry is in a stronger capital and surplus position than it has ever been in and it clearly has enough capital and surplus to meet the needs of the insurance industry today and in the near future."

— *Dr. Michael E. Hogue, President and managing director of Insurance Research Group, at the 1985 convention of the National Association of Professional Insurance Agents*

"The push to tort reform is a cynical scheme to pin the blame on the courts for the current high costs of commercial liability insurance while allowing the insurance industry to escape blame for its own financial mismanagement."

— *St. Petersburg Times (Florida), 4/20/86*

"The latest financial results lead us to repeat an observation we made sometime ago. . . . It was our impression that the 'crisis' was brought on by the intense rate-cutting wars begun in the late 1970's, and the huge premium increases and the more selective risktaking of the past year would soon end the crisis."

— *Chicago Sun-Times, 8/30/86*

"The industry is saying 'give us tort reform and that will solve the problem.' The fact of the matter is, we have to solve our own problem, which means underwrite properly, price correctly, adjust losses correctly. . . ."

— *Joe Decaminada, Senior Vice-President, Secretary, and counsel for Atlantic Mutual Insurance Co., National Underwriter, 11/28/86*

"Even while the industry was blaming its troubles on the tort system, many experts pointed out that its problems were largely self-made. In previous years the industry had slashed prices competitively to the point that it incurred enormous losses. That, rather than excessive jury awards, explained most of the industry's financial difficulties. Now that insurers have been able to push up prices, profitability is returning. Nothing complicated about that."

— *Business Week, 1/12/87*

On Medical Malpractice

"When one looks at the data, the overwhelming causes of the medical malpractice insurance crisis are: (1) malpractice, (2) poor underwriting practices by insurance companies, and (3) very weak disciplining of incompetent or negligent physicians by hospitals, medical societies, state licensing boards and federal peer review agencies."

— *Ralph Nader, syndicated column, 1986*

"The greatest cause of malpractice is malpractice. You must understand that some of the malpractice out there is so grievous, offensive and implausible as to beggar the imagination. Without real malpractice, we would not have this problem."

— *Barry S. Shitrit, M.D., Director of Maternal/Fetal Medicine of Pasadena's Huntington Memorial Hospital reported in the A.M.A. News, 6/21/87*

"A Pennsylvania study conducted by the medical society and the trial lawyers showed 1% of physicians (228) responsible for 25% of all malpractice payments by the insurance fund. All of these physicians had multiple claims in a ten-year period."

— *Joan Claybrook, President of Public Citizen, Baltimore Sun, March 1986*

DO LIABILITY REFORMS WORK?

Editors' Note: In the last issue of *The Fiscal Letter*, an article appeared on liability insurance that examined the roots of the problem and potential solutions. This is the second and final article on the liability insurance issue. It examines the evidence concerning some proposed reforms to deal with the problem.

In the past year, there has been a dramatic increase in the price of many types of liability insurance. As a result, states across the country are considering legislation designed to assure that individuals, businesses, organizations, and state and local governments can purchase needed liability insurance at an affordable price. Legislators have introduced more than 1,000 bills this year to deal with what some term the liability insurance "crisis."

Many of the measures being considered would place significant new limits on the ability of one or more of the parties in a liability case to sue, collect damages, or be reimbursed for their services. Examples of such measures include proposals to cap or eliminate awards for non-economic damages, shorten the maximum time a plaintiff has to file suit after the injury has been discovered or occurred, pay out awards on a periodic rather than lump sum basis, and deduct from a jury award compensation to the plaintiff from sources other than the defendant (i.e., eliminate the collateral source rule).

What evidence is there that these or any of the other reforms being proposed will actually hold down the costs of liability insurance and/or make it more available?

Unfortunately, few have attempted to measure the effectiveness of liability insurance/tort reforms designed to improve the availability and affordability of insurance. This is true despite the fact that most of the proposals currently under consideration by legislatures have been in place in at least a few states for 10 years or longer.

Research on the effects of reforms has been complicated by the difficulty of accurately characterizing reforms. Not every state reforming a specific element of tort law has made precisely the same change. In addition, the complexity of reforms, typically mixing many different elements in one package, has hampered researchers' efforts to isolate the effect of any single element.

The best available data on the effectiveness of tort reforms comes from a series of studies written for the Institute for Civil Justice and published by The Rand Corporation over the past three years. None of these studies attempts to assess the fairness of the reforms; rather, they look at their effect on the number of claims (frequency) and size of awards (severity). The results of the Rand studies, plus those from a study by the Intergovernmental Health Policy Project, are presented below.

Limits on Contingent Fees

"Limits on contingent fees charged by plaintiffs' attorneys decrease settlement size, increase the likelihood that a case is dropped, and decrease the likelihood of litigation to verdict." This was the finding of Patricia Munch Danzon and Lee A. Lillard in their 1982 report, "The Resolution of Medical Malpractice Claims." It is based on an application of a model of the process of dispute resolution to data on over 5,800 claims closed in 1974 and 1976.

Caps on Awards

As a result of the perceived medical malpractice crisis in the mid-1970s, several states passed laws limiting medical malpractice awards for non-economic damages. In 1982, Danzon published a second study, "The Frequency and Severity of Medical Malpractice Claims," in which she examined the effect of the post-1975 tort reforms, using Insurance Services Office data. She found that, of the post-1975 tort reforms, only those designed to reduce awards had had a "significant impact" by 1978. She estimated that states enacting a cap had 19 percent lower awards, on average within two years, than they would have had without the caps.

In a 1985 study, "Punitive Damages: Preliminary Empirical Findings," Mark A. Peterson analyzed data on punitive damages awarded between 1959 and 1984 by juries in Cook County, Illinois, and San Francisco, California. Peterson found that San Francisco juries were much less likely than Cook County juries to make punitive awards because the Illinois statute permits punitive awards against plaintiffs who acted in gross negligence, but the California statute does not. Negligent tortfeasors are subject to punitive damages in California only if their actions imply malice.

Mandatory Collateral Source Effort

In addition to placing limits on awards, several states passed laws in the mid-1970s to require mandatory collateral offset, thus banning double recovery. Danzon also estimated the effect of this reform in "The Frequency and Severity of Medical Malpractice Claims." She found that, "Mandatory collateral source offset in effect for two years is estimated to result in a 50 percent reduction in severity" compared to what it would be without the offset. She cautions, however, that her estimate is based on claims closed in calendar years 1975-1978 and does not measure the full long-term effects on claim costs on a policy-year basis.

Statutes of Limitation

Another finding of Danzon's "The Frequency and Severity of Medical Malpractice Claims" was that long pre-1975 statutes of limitation contributed to higher claim costs in some states

(Continued on next page)

LIABILITY REFORMS (Conclusion)

through 1978, with a greater impact on the size of awards than on frequency. She notes that because of long lags in disposition, effects of a statute of limitation change are reflected in changes in claim closures with a lag. Therefore, states should not expect to see an immediate effect on either frequency or severity of claims as a result of amending their statute of limitation.

Pre-Trial Screening Panels

Pre-trial screening panels are prerequisites to trial. They are intended to speed resolution of medical liability claims, reduce the number of claims going to trial, and eliminate non-meritorious suits.

In 1980, the Intergovernmental Health Policy Project published a report entitled, "Pre-Trial Screening Panels: A Review of the Evidence." Among other things, the report concluded, "On the whole, screening panels dispose of malpractice claims at a faster rate than conventional litigation." The report counseled, however, that the effectiveness of pre-trial screening panels depended in large part on how they are organized. For instance, it recommended that the panel system be mandatory and that states implement disincentives to prevent losing parties from proceeding to litigation.

Combined Effects of Tort Reforms

In "The Resolution of Medical Malpractice Claims," Danzon, using a model of the dispute resolution process and mid-1970s data, estimated the combined effect of the following award-limiting measures: dollar caps, periodic rather than lump sum payments, and elimination of specific monetary requests by plaintiffs (i.e., by barring the ad damnum clause). She concluded that, taken together, these measures "significantly reduce awards and reduce the probable size of payment in out-of-court settlements."

Policy Implications

One should not conclude, based on the results of the studies cited above, that to solve the liability insurance problem states should rush to limit contingency fees, cap awards, ban double recovery, shorten statutes of limitation, set up pre-trial screening panels, bar the ad damnum clause, and/or require periodic payment of damages.

While the studies show that these measures may significantly reduce the number of claims filed or the average size of an award, they do not consider their effect on a number of other factors of concern to state policymakers. These include such things as controlling the cost of liability insurance, assuring equitable redress for negligent injury, deterring negligent practice, and developing legislation that can withstand legal challenges.

The dearth of good data available to assess the nature and causes of the liability insurance crisis on the one hand, and to measure the impact of proposed reforms on the other, suggests states should consider legislation to make sure such data are available. For example, a 1985 Washington law requires submission of insurance data for physicians, surgeons, hospitals, and other health care professions and facilities. Malpractice insurers must submit data concerning claims, settlements, premiums, investment income, reserves, and estimates of incurred claims.

In enacting tort reforms or other measures aimed at improving the availability and affordability of liability insurance, states should consider including steps to assess their effectiveness in order to better assess the problem and the impact of reforms.

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State Responses to the Malpractice Insurance "Crisis" of the 1970s: An Empirical Assessment

Frank A. Sloan, Vanderbilt University

Abstract. Almost all states enacted legislation in response to the rapid rise in malpractice insurance premiums which occurred during the mid-1970s. After describing the types of statutory changes enacted, this study evaluates the influence of these changes on levels and growth of premiums paid by general practitioners, ophthalmologists, and orthopedic surgeons during 1974-78. The empirical results of the study presented here give no indication that individual state legislative actions, or actions taken collectively, had their intended effects on premiums. Several explanations for this result are explored.

The medical malpractice "crisis" of the mid-1970s involved both a dramatic increase in premiums, and a reluctance on the part of many companies to write medical malpractice insurance policies. From 1974 to 1977, malpractice premiums almost doubled, following several years of relative calm.¹ The increased premiums were perceived by the public and their elected representatives as potential sources of medical care cost inflation; and it was feared that nonavailability of coverage might lead to nonavailability of certain types of needed medical services. As a result, virtually all states took some type of legislative action to ensure the availability of malpractice insurance at a reasonable price.² With isolated exceptions,³ both the rate of premium inflation and availability problems have largely abated since this period of crisis.⁴ Yet some observers have predicted that the late 1970s and early 1980s have been only a temporary calm before another storm.⁵

There is substantial variation in malpractice insurance premiums—among physician specialties and across states, as well as over time. In the mid-1970s, premiums in a high-risk specialty, orthopedic surgery, were about six times as great as those for the lowest-risk ("Class 1") specialists, including pediatricians and general practitioners who do no surgery.⁶ The reason for such interspecialty variation in premiums is reasonably well understood: claims against physicians in surgical subspecialties in particular are much more frequent than in fields without a hospital orientation, such as general/family medicine and pediatrics.⁷

Partial support for this study came from contract #500 78-0018 between the U.S. Health Care Financing Administration and Vanderbilt University. The views expressed here are the author's, and do not necessarily reflect the view of either organization. The author is grateful to Nanette Fancher and Robert Hays for assistance in this research.

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Economic Development
Division of Insurance

Sources of interstate (and intertemporal) variation are much more complex. As an illustration of interstate variation in premiums within a specialty, premiums paid by orthopedic surgeons in 1974 varied from a high of \$8,352 (in New York) to a low of \$479 (in North Carolina), a more than seventeen-fold difference.⁸ As will be discussed more fully below, the correlations in premiums paid for standard coverage levels by physicians in various specialties within a state are high, as are correlations among annual changes in premiums by specialty. Thus essentially the same degree of interspecialty and interstate dispersion has been preserved since 1974.

To date, no one has isolated the effects of specific legislative actions on either the price or availability of malpractice insurance. Statutory changes potentially affect the frequency of claims, the likelihood of judicial determination in favor of the plaintiff, and the size distribution of settlements. Expected payouts of insurers, as well as projected administrative costs and profit margins, are in turn reflected in premiums.⁹ Thus, by affecting elements of expected payouts, statutory changes could have reduced premiums directly. Alternatively, the publicity effect surrounding legislative activity may have caused the public (and, for that matter, juries) to become more cost-conscious, when in fact the direct constraining impact of the laws themselves was rather minimal. Or the legislative initiatives may have unintentionally fooled insurers, by creating anticipations that both the frequency and magnitude of settlements would decrease when in fact these were not to occur.

The next two sections provide some pertinent conceptual and empirical background information on the malpractice insurance crisis of the mid-1970s, and describe specific legislative responses to the crisis at the state level. Empirical specification of premium regressions designed to assess the effects of these legislative responses, and explanation of empirical results obtained from this procedure, are provided in the third section, followed by a brief discussion of implications.

Background

Concepts. Insurers set premiums (P) to cover expected benefit payments (B) and administrative expense (A):

$$P = B + A. \quad (1)$$

Benefits payments can be expressed as the product of the number of claims (C), the probability of a decision favorable to the plaintiff (Q), and the mean dollar settlement if the plaintiff wins (X):

$$B = CQX. \quad (2)$$

Administrative expense consists of legal expenditures on behalf of medical defendants, other administrative expense (A_0), such as for marketing, and profit (π):

$$A = CY + A_0(N) + \pi, \quad (3)$$

where Y is the legal expense incurred by the insurer per claim, and N is the

number of enrollees. To simplify, let $A^* = A_0(N) + \pi$, where A^* is a constant. This simplifying analytical assumption is justified since increased expense and profit rates are not generally considered to be reasons for the rise in malpractice insurance. Then, substituting (2) and (3) into (1), the premium equation becomes

$$P = C(QX + Y) + A^*. \quad (4)$$

Totally differentiating (4), it is apparent that the change in premiums depends on changes in the number of claims, in the probability of the plaintiff winning, in the insurer's legal cost per claim, and interactions among these changes, as well as changes in premium pricing policy as reflected in any change in A^* .

The number of claims filed by unsatisfied patients in a given state and year plausibly reflects the expected settlement net of legal fees ($QX - F$), patient relationships with physicians, and characteristics of such patients—including their degree of aversion to risk and to litigation. Legal fees per case depend, *inter alia*, on the number of lawyers per capita population. The probability of the plaintiff winning (Q) and the mean settlement size (X) would logically depend on the nature and extent of the iatrogenic injury, the defendant's conformance with medical standards in his/her local community, and characteristics of laws regarding malpractice in the state. Litigation (and presumably iatrogenic injury) is more likely when a surgical procedure has been performed. Apparently X also depends on patient income: patients with high opportunity costs of time have been found to obtain higher settlements, holding other factors constant.¹⁰ But to the extent that affluent persons demand care from higher-quality doctors, Q should be lower. Thus, the effect of time cost—or its proxy, income per capita—on QX cannot be determined in advance of empirical research.

This brief discussion implies that empirical analysis should describe the type of medical procedures performed, variables from the lawyer's market pertinent to fee-setting, and patient characteristics (including income), as well as the legal environment. Ideally, one would also want to understand insurer pricing policy (which, in part, reflects elements of A^*), and how insurer expectations of future benefit outlays are formed. The latter phenomena, however, are difficult to measure empirically.

Previous empirical studies. Two published studies by economists have examined interstate variations in premiums and frequency of malpractice incidents. Using regression analysis, with states as observational units for years 1970 and 1972, Reder related the malpractice premium paid by surgeons to four explanatory variables: (1) operations per surgeon; (2) nonfederal attorneys per capita population; (3) number of "key doctrines" favorable to plaintiff adopted by the state; and (4) state per capita income.¹¹ Only two of the four independent variables showed statistically significant impacts on premiums: per capita income and legal doctrines. The positive effect of per capita income suggests that the effect of any tendency for higher-income persons to select higher-quality doctors is more than offset by a combination of effects of patient income on settlement size and on the propensity to sue.

Feldman assessed state differences in the number of malpractice incidents per 1,000 state population in 1970.¹² He included as explanatory variables surgical operations per 1,000 population, per capita income, lawyers' earnings, variables representing ten legal doctrines bearing on the processing or outcome of malpractice cases,¹³ and (in one regression) a measure of defensive medicine. He found that the number of incidents rises with increases in surgical operations and in income, and falls with increases in lawyers' earnings. He also found that the plaintiff's return net of the payment for legal fees ($QX - F$) falls with increases in the lawyer's wage.

A legal variable constructed as the sum of the ten individual binary variables showed that states with laws more favorable to plaintiffs have more suits, a finding consistent with Reder's analysis; however, when the individual legal variables were included as separate explanatory variables, Feldman obtained few statistically significant parameter estimates. Feldman also expected that "defensive medicine" would reduce the occurrence of malpractice claims. He measured this factor with a variable defined as the weighted average of office visits by Medicare patients which entailed laboratory tests, x-rays, and consultations with other physicians. Feldman's results suggest more definite roles for income, frequency of surgery, and lawyer price-availability than for either legal doctrines or "defensive medicine" as determinants of interstate variation in the number of malpractice suits. Characterizing the nature of tort law by state at a given point in time, in terms of its relative impacts on plaintiffs versus defendants, is extremely difficult, and measurement errors could partially account for the legal variables' insignificance. A more accurate picture may be obtained by relating changes in incidents or premiums to changes in laws.

Dynamic factors. Many of the potential determinants of temporal change in malpractice costs and insurance premiums are not captured by analysis of a single cross-section; and of the dynamic factors, many are common to all specialties and states: technological change in the health field; rising patient expectations about the efficiency of medical care; loss of close relationships between providers and patients due to the rise in physician specialization; increased litigiousness of society; changes in quality of medical care; changes in attitudes of juries; and (for premiums, though not for malpractice incidents) returns on insurers' investments.

There is no consensus about the origins of the mid-1970s crisis, or, for that matter, why it passed. The industry justified substantial premium increases on grounds that insurers were losing money at their then-current malpractice insurance rates. However, profitability not only depends on loss ratios, but also on returns on investment of insurer reserves.¹⁴ Insurers suffered paper losses in the 1974-75 stock market, and this development may have been contributory. Critics of the insurance industry, such as Law and Polan, have stated that—with a few exceptions, such as New York and California—insurance companies in the mid-1970s acted on the basis of events having little to do with their local

situations. Law and Polan argued that the broad-scale panic was due at least in part to the actions of a single company, Argonaut, which had responded decisively to its adverse loss experience in several markets.¹⁵ Rather than assessing their own situation, other companies simply panicked. According to this psychological view of the crisis, matters eventually settled down after time allowed more objective assessments of the situation. Others have attributed the end of the crisis to fear of countersuits and lack of lawyer familiarity with the new state malpractice statutes, which might have the effect of delaying the filing of suits, even if the statutes themselves had no long-term effects.¹⁶

State Legislative Responses

The crisis of the mid-1970s provided the impetus for numerous legislative proposals applying to actions alleging medical malpractice. Legislators assumed that, if new laws could reduce the number and dollar amounts of malpractice awards, insurers would be in a better position to predict recoveries, and therefore would maintain coverage at reasonable rates and assure availability of malpractice insurance. Statutory changes were quite narrowly focused on medical malpractice, and many of them were tested in the courts in the late 1970s and early 1980s.¹⁷ This section briefly describes most of the major legislative changes, the effects of which are to be evaluated below. These legislative proposals may be classified into three general categories: tort modifications, alternatives to trial, and insurance provisions.

Tort modifications

Limiting provider payments to plaintiffs. Several states enacted laws placing a dollar maximum on the amount providers are required to pay in medical malpractice cases. A limitation on provider liability was often imposed in conjunction with a limitation on plaintiff recovery. A ceiling on either the provider's liability or plaintiff's recovery potentially shifts some costs of damages to plaintiffs. Conversely, to the extent that awards had been "excessive" heretofore, particularly for such subjective items as "pain and suffering," the savings accrue to physicians and the public at large. Although these laws potentially reduce premiums, they will be successful only to the degree that settlements would otherwise have exceeded the ceilings, and/or that the initiation of malpractice suits is discouraged by a decline in ($QX - F$). Unfortunately, data are not available for comparing the frequency distribution of settlements to the ceilings in states which enacted these limitations.

In some states, patient compensation funds have been established to pay plaintiffs for damages incurred above the statutorily-determined limit on provider liability. These funds are financed by adding a surcharge to each physician's

premium—a surcharge often set so as to subsidize the premiums of physicians in high-risk specialties. The main effect of such funds, if any, is likely to be on amounts of insurance (i.e., liability limits) purchased by physicians, rather than on the premium for a specific amount of coverage (such as a \$100,000/\$300,000 policy).

Limiting use of the *res ipsa loquitur* doctrine. The doctrine of *res ipsa loquitur* applies when a plaintiff can show (1) that the event only could have occurred as a result of negligence, (2) that harm was caused while the instrumentality causing the injury was exclusively controlled by the defendant, and (3) that the plaintiff did not contribute to the injury.¹⁸ This doctrine may be useful to plaintiffs when, for lack of specific information, the plaintiff cannot develop a *prima facie* case against the defendant.

Courts in a number of states expanded applicability of the doctrine of *res ipsa* in the early 1970s.¹⁹ Since 1975, this trend has been reversed: state legislation has delineated situations in which *res ipsa* can be applied (e.g., to foreign objects left in the body, or radiation burns); and in some states (e.g., Washington), the use of *res ipsa* in malpractice cases has been virtually eliminated. A study of medical malpractice claims reported that plaintiffs were slightly more likely to win when the *res ipsa* doctrine was used;²⁰ hence limiting use of *res ipsa* may have had some but probably not a dramatic effect on premiums.

Tightening the statute of limitations. Statutes of limitations have received considerable attention in discussions of medical malpractice insurance. One reason is the lengthy time-lag which often occurs between the date an injury occurs and the date the claim is first made. Time-lags are particularly problematic in this area since malpractice insurance has typically been sold on an "occurrence" basis—that is, the insurer protects the provider against any claim that may eventually arise from a litigatable "event" that occurred during the policy years. Insurers have maintained that the persistent threat of a suit compels them to maintain substantial reserves; in any case, rate-setting is made more difficult by the possibility of delayed suits.²¹

Furthermore, there is empirical evidence that claims filed five years after the injury are more than twice as expensive as the average award.²² Thus late claims represent a substantial risk to the insurer, and one can expect a risk premium to be charged for indemnifying physicians against such claims. State legislatures modified existing statutes of limitations to establish definite, presumably shorter, periods during which a medical malpractice action must be brought. However, the new limits contain exceptions which, in conjunction with interpretations of state courts, could have important implications for the effectiveness of the new limits.²³

Clarifying informed consent. The doctrine of informed consent requires that a provider disclose information pertinent to the nature, purpose, and risks associated with a proposed medical treatment. Unfortunately, while the doctrine's intent is clear, whether patients were in practice properly informed is difficult to

document. During the mid-1970s, many experts held that ambiguity created by this doctrine was in itself a source of litigation, and several states added precision to the doctrine of informed consent to insure uniform definition and application.

Imposing contingent-fee regulation. It is often argued by physicians and others that payment of lawyers on a contingent-fee basis for work on malpractice cases increases the total number of claims.²⁴ Assuming patients are risk-averse, a plausible assumption for plaintiffs in the aggregate, economic theory supports this assertion.²⁵ Unfortunately, there is no empirical evidence on whether or not the method of lawyer compensation has an independent effect on the frequency of suits or on settlement amounts. Since 1975, several legislatures have limited attorneys' fees in medical malpractice cases either by empowering state courts to determine reasonableness of attorneys' fees, by statutorily fixing a percentage ceiling for contingent fees, or by adopting a sliding scale which bases the contingency-fee percentage on the amount of recovery. The latter two approaches at least have the potential of reducing lawyers' incentives to accept malpractice cases; the first is weakened by courts' reluctance to interfere with the attorney-client relationship.²⁶

Adding collateral-source provisions. The collateral-source rule makes it impossible for the court to apply benefits received by an injured party from sources other than the defendant as an offset to compensation due from the defendant. Hence a medical malpractice plaintiff may collect benefits from a variety of sources, the sum of which may be substantially in excess of damages incurred. A number of states enacted legislation during the mid-1970s to limit such duplication of payments. Two types of laws have been enacted. One type permits introduction of evidence of payments received from collateral sources, allowing the jury to consider such evidence in determining the defendant's obligation to the plaintiff; the other approach requires that there be an offset.²⁷ These changes have been controversial. Proponents of the collateral-source rule have argued that the rule preserves patients' incentive to purchase insurance, and that the reduction in defendants' liability may reduce the deterrent effect of liability.²⁸

Eliminating the *ad damnum* clause. The *ad damnum* clause is part of the plaintiff's initial pleadings, stating the amount of monetary damage incurred and the settlement requested. Although the *ad damnum* clause may be seen as no more than the presentation of an initial asking price, it may influence the jury to award a larger settlement. More recent legislation eliminates *ad damnum*; but some laws now also require that the defendant be informed during pre-trial discovery of the precise amount of recovery sought by the plaintiff.²⁹

Imposing a locality rule. Historically, health care providers have been expected to render care consistent with the general standard of care in their community. Because of improved communication and more uniform professional training, courts in many states have interpreted "community" quite broadly, encompassing regional if not national standards. There are two major reasons for dissatisfaction with this trend. First, many providers argue that this broad interpretation

leads to the use of "hired guns"—providers who specialize in testifying on the plaintiff's behalf. Second, adherence to regional and/or national norms may require that many physicians orient their practices to higher standards, which in turn results in more costly care. In response to this dissatisfaction, several states during the mid-1970s adopted rules requiring use of a local standard of care and/or of local expert witnesses.³⁰

Alternatives to jury trial

Mandating use of a pretrial screening panel. During the mid-1970s, more than half of the state legislatures established pretrial screening panels to which cases must be submitted before they proceed to trial. Statutes vary substantially in terms of panel composition, procedural details, and admissibility of findings at subsequent trial. Virtually no other "reform" has elicited as much challenge in the courts as the concept of pretrial screening, principally because the panels are viewed as interfering with a plaintiff's right to a jury trial.³¹

Irrespective of the constitutional issues, there is some reason to believe that panels may not be effective in terms of reducing premiums. First, for any cases not settled during the pretrial hearing, and many are not, rather than substitute for the jury trial the panel adds another layer of proceedings. Second, although proceedings of the panels are less formal than a full-scale trial, substantial legal expenses may be incurred, especially in states where decisions of the panels are admissible at trial. Third, the existence of an informal and initially less expensive adjudication mechanism may in itself encourage the filing of claims.³²

Allowing for binding arbitration. Binding arbitration differs from pretrial screening in that the decision of an arbitration board is final; unlike screening, arbitration is not followed by a jury trial. Proponents of arbitration argue that it reduces malpractice costs by resolving disputes in a less formal setting, through a panel of experts rather than a jury (which is both nonexpert and subject to emotionalism). These contentions are debatable.³³ Although, in principle, arbitration may be either compulsory or voluntary, no state to date has mandated compulsory arbitration, probably because of doubts about its constitutionality.³⁴

Insurance provisions

Creating joint underwriting associations. Enabling legislation for the establishment of non-profit joint underwriting associations (JUAs) has been passed in the majority of states, but implemented in only a few. A JUA is a pooling arrangement composed of commercial liability insurers with business in the state. All JUA statutes require that premium rates be established on a self-sustaining basis: if losses occur, member companies may be assessed to cover the deficit. In some states, assessments may be recouped by subtracting the assessment due the state from the premium tax, or by instituting a surcharge on premiums paid by providers. JUA surpluses are to be used for premium reductions. Statutes nor-

mally expire two or three years after enactment; depending on state statute, the JUA may be the exclusive carrier, or may compete with others.³⁵ In some states where JUAs are monopolists, they have been subject to criticism by doctors for their high rates.³⁶ JUAs may be a better solution for the problem of malpractice insurance availability than for the cost problem.

Allowing formation of health care mutual insurance companies. A few states have recently enacted legislation authorizing creation of insurance companies owned and operated by associations of physicians. These firms assess physician members a one-time special charge (about one year's premium), which is refundable if the company succeeds.³⁷ Since these mutual companies are run by physicians, they presumably have a special incentive to control premium increases.

Empirical Specification and Results

Overview. The regression analysis presented here extends the work of Reder and Feldman.³⁸ It focuses on the role of legal variables during a period of rapid change in malpractice insurance premiums. The analysis is based on a time series of cross-sections covering the years 1974 through 1978, with the state as the observational unit. All continuous variables are expressed in logarithmic form; all binary variables enter linearly. Two alternative types of equations are specified: (1) premium levels, and (2) annual percentage change in premium levels. In the latter, the dependent variable is the difference in the logarithm of premiums in a given specialty between a year and the year immediately preceding it. This difference (multiplied by 100) yields a percentage change. When the premium equation is in difference form, the regressions span 1975–1978 (annual changes for 1974–75 through 1977–78). None of the previous studies have examined changes in premiums over time.

Dependent variables. The dependent variables refer to premiums paid by physicians in three fields—general practitioners who do no surgery, ophthalmologists, and orthopedic surgeons—deflated by a state price index that varies across states and over time (with 1967 = 1.0).³⁹ Premiums are defined for a policy offering \$100,000/\$300,000 coverage.⁴⁰

Premiums for various specialties in a state are highly correlated: pair-wise correlations between general practitioners, ophthalmologists, and orthopedic surgeons based on these state data are all 0.92 or higher; correlations between annual percentage changes in premiums in the three fields are also high, all 0.91 or higher. These correlations imply either that all the physicians in a given state share the financial consequences of adverse experience of a few specialties, or that claim experiences among specialties within a state tend to move together. The former possibility is far more likely.

Table 1. Explanatory Variable Definitions, Means, and Standard Deviations

Variable Name	Definition	Mean	Std. Dev.
Y	Real per capita income	3717.0	503.0
OPSPOP	Surgical operations per 1,000 population	0.0812	0.0164
LAWPOP	Lawyers per 10,000 population	12.4	11.7
MDPOP	Patient care physicians per 10,000 population	13.0	4.4
LRECOV	Provider liability limited	0.18	0.38
LLIM	Recovery by plaintiff limited	0.23	0.42
PTCOMP	Patient compensation fund established	0.18	0.38
RESIPS	Use of <i>res ipsa loquitur</i> limited	0.22	0.41
ICON	Informed consent clarified	0.32	0.47
CONFEE	Contingency-fee regulation imposed	0.27	0.45
SLIM	Statute of limitations tightened	0.50	0.50
CSOUR	Collateral-source provisions added	0.24	0.43
ADDAM	<i>Ad damnum</i> clause eliminated	0.40	0.49
LOCAL	Locality rule imposed	0.22	0.41
SCREEN	Use of pretrial screening panels mandated	0.40	0.49
ARBIT	Binding arbitration provided	0.17	0.38
JUA	JUA major insurer in state	0.06	0.24
SELINS	Health care mutual insurance company implemented	0.08	0.28
T74	Year = 1974	0.19	0.39
T75	Year = 1975	0.20	0.40
T76	Year = 1976	0.20	0.40
T77	Year = 1977	0.20	0.40

Explanatory variables. The focus of the regression analysis is on the impacts of legislative changes on levels and rates of change in malpractice premiums. To isolate the impacts of legal influences on the dependent variables, it is necessary to consider the other possibly influential factors that were reviewed in the conceptual discussion above, such as patient income, availability of lawyers, and case-mix. The premium equations contain three control variables similar to those included by Reder and Feldman: per capita income (deflated by the state price index)—Y; surgical operations per 1,000 population—OPSPOP; and lawyers per 10,000 population—LAWPOP. In addition, the number of physicians primarily engaged in patient care (as opposed to administration, research, and/or teaching) per 10,000 state population—MDPOP—is included. Although a higher surgery rate may be expected to lead to a higher incidence of malpractice claims, a higher physician-population ratio may have the opposite effect, since patient access improves with increases in the physician-population ratio. More specifically, patients' office waiting time falls, and the length of time physicians spend with patients rises.⁴¹ Thus, even if medically defined quality is not altered,

patients may feel better about their doctors and thus be less prone to sue them.⁴² As an alternative to MDPOP, a variable indicating physician availability in the specialty corresponding to the premium was entered as an explanatory variable; results were virtually identical to those shown below.

When premiums are expressed as levels, it is appropriate to control for the legal environment prior to the mid-1970s. Preliminary regressions contained a legal variable to describe the application of tort law by state, as constructed by Feldman, and, alternatively, a legal index based on parameter estimates from Feldman's regression (which had malpractice claims frequency as the dependent variable).⁴³ Neither legal variable showed a discernible impact on premiums once other explanatory variables were included, and both were dropped from the regressions without having a consistent effect on the parameter estimates on the remaining variables. Binary variables representing each state were added to account for omitted state effects on premiums.

Variables depicting legislative responses to the malpractice crisis of the mid-1970s are shown in boldface in Table 1.⁴⁴ The variables ordinarily assume the value 1 for the year a malpractice "reform" was enacted by the state legislature and for succeeding years, and are zero otherwise. There is, however, one exception: when a reform was subsequently overturned by judicial decision, the variable assumes the value zero in the year in which the decision was reached and thereafter. Correlations among the "legislative response" variables are almost always positive, and most often in the 0.2 to 0.4 range. The highest correlation, not surprisingly, is between limitation on recovery and the patient compensation fund (0.63).⁴⁵

Finally, time variables T74 through T77 represent time-related effects common to all states. Several alternative specifications were explored in order to gauge the time-phasing of responses to recent legislation and other explanatory variables, all using premium levels as the dependent variable. In one, a lagged dependent variable was included (Koyck lag specification). Results from these regressions imply that around 90 percent of the response to a change in an explanatory variable takes place in the year following the change, quite a rapid response. Alternatively, explanatory variables for both the current and the preceding year were included in the same regression. The resulting parameter estimates were very unstable because of multicollinearity.

Empirical results

Regressions with premium levels as dependent variables are presented in Table 2. The first, second, and fourth regressions also contain individual state binary variables, not shown. The state binary variables should account for factors responsible for any continued interstate differences in real premiums that are not explained by the first set of explanatory variables (from Y through MDPOP).

If legislative changes were effective, legislative change variables should dem-

Table 2. Premium Level Regressions

Explanatory Variables	Dependent Variables			
	1. General Practitioner Premium		2. Ophthalmologist Premium	
	Coeff.	S.E.	Coeff.	S.E.
Y	0.42	(0.66)	0.44	(0.70)
OPSPOP	1.016 ^c	(0.60)	1.11 ^c	(0.63)
LAWPOP	1.020	(0.80)	1.31	(0.85)
MDPOP	-0.22	(0.87)	-0.49	(0.93)
LRECOV	-0.080	(0.088)	-0.027	(0.093)
LLIM	0.046	(0.093)	0.046	(0.098)
PTCOMP	0.039	(0.10)	0.0005	(0.11)
RESIPS	0.001	(0.094)	-0.037	(0.010)
ICON	-0.009	(0.085)	0.046	(0.090)
CONFEE	-0.011	(0.100)	0.013	(0.11)
SLIM	-0.047	(0.072)	-0.020	(0.077)
CSOUR	0.012	(0.094)	0.038	(0.099)
ADDAM	0.10	(0.087)	0.079	(0.084)
LOCAL	0.18 ^b	(0.08)	0.11	(0.089)
SCREEN	-0.19 ^a	(0.07)	-0.19 ^a	(0.071)
ARBIT	0.26 ^a	(0.09)	0.29 ^a	(0.096)
JUA	0.13	(0.11)	0.080	(0.12)
SELINS	0.16 ^c	(0.09)	0.048	(0.098)
T74	-0.21	(0.17)	-0.13	(0.18)
T75	0.074	(0.14)	0.063	(0.15)
T76	0.09	(0.11)	0.077	(0.11)
T77	0.065	(0.061)	0.070	(0.065)
Constant	5.16		6.37	
	$R^2 = 0.87$		$R^2 = 0.84$	
	$F(69,166) = 16.4$		$F(69,166) = 12.4$	

a. Statistically significant at the 1% level (two-tailed test).

b. Statistically significant at the 5% level (two-tailed test).

c. Statistically significant at the 10% level (two-tailed test).

onstrate negative effects on real premiums. But, as Table 2 shows, there are more positive than negative coefficients for the variables *LRECOV* through *SELINS*. The most consistently significant coefficients are for screening panels (*SCREEN*), arbitration (*ARBIT*), and, to a lesser extent, mutual insurance companies (*SELINS*). But of these, only the screening variable shows a negative impact on premiums.

The fact that the regression results are quite similar for the three specialties is not surprising, in view of the high simple correlations among premiums in the

Table 2, continued

	Dependent Variables			
	3. Orthopedic Surgeon Premium*		4. Orthopedic Surgeon Premium	
	Coeff.	S.E.	Coeff.	S.E.
Y	0.28	(0.34)	0.51	(0.71)
OSPOP	-0.23	(0.44)	1.11 ^c	(0.64)
LAWPOP	0.88 ^a	(0.23)	1.04	(0.87)
MDPOP	0.25	(0.24)	0.17	(0.94)
LRECOV	0.019	(0.11)	-0.16	(0.09)
LLIM	0.11	(0.11)	0.024	(0.10)
PTCOMP	0.11	(0.12)	0.046	(0.11)
RESIPS	-0.088	(0.13)	0.052	(0.10)
ICON	0.28 ^a	(0.11)	0.022	(0.091)
CONFEE	0.24 ^b	(0.11)	-0.031	(0.11)
SLIM	0.016	(0.089)	0.0009	(0.078)
CSOUR	-0.15	(0.12)	-0.013	(0.10)
ADDAM	-0.15	(0.10)	0.13	(0.085)
LOCAL	0.069	(0.11)	0.093	(0.090)
SCREEN	-0.16 ^c	(0.09)	-0.15 ^b	(0.072)
ARBIT	0.25 ^a	(0.10)	0.18 ^c	(0.097)
JUA	-0.099	(0.16)	0.11	(0.12)
SELINS	0.31 ^b	(0.14)	0.13	(0.10)
T74	-	(-)	-0.18	(0.18)
T75	-	(-)	0.15	(0.15)
T76	-	(-)	0.15	(0.11)
T77	-	(-)	0.090	(0.07)
Constant	4.69		6.63	
	$R^2 = 0.36$		$R^2 = 0.86$	
	$F(18,217) = 6.9$		$F(69,166) = 14.6$	

* Both time and state binary variables omitted from this regression.

a. Statistically significant at the 1% level (two-tailed test).

b. Statistically significant at the 5% level (two-tailed test).

c. Statistically significant at the 10% level (two-tailed test).

three specialties. The only one among the first set of explanatory variables (from *Y* to *MDPOP*)⁴⁶ to show a significant impact on premiums in more than one regression is the surgery rate (*OPSPOP*), which loses significance when the time and state binary variables are omitted (regression #3). The size of the *OPSPOP* coefficient is about the same for GP premiums as it is for the surgical specialists,

Table 3. Annual Change Regressions

Explanatory Variables	Dependent Variables					
	1. General Practitioner Premium		2. Ophthalmologist Premium		3. Orthopedic Surgeon Premium	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
LRECOV	-0.010	(0.064)	0.0001	(0.069)	-0.040	(0.070)
LLIM	0.040	(0.066)	0.018	(0.072)	0.027	(0.072)
PTCOMP	-0.012	(0.071)	-0.0003	(0.079)	0.014	(0.079)
RESIPS	0.043	(0.077)	0.040	(0.085)	0.089	(0.085)
ICON	-0.056	(0.067)	-0.055	(0.073)	-0.057	(0.073)
CONFEE	0.0002	(0.06)	0.007	(0.071)	-0.018	(0.071)
SLIM	-0.006	(0.053)	0.019	(0.058)	0.012	(0.058)
CSOUR	0.007	(0.07)	0.030	(0.078)	0.018	(0.078)
ADDAM	0.050	(0.061)	0.039	(0.067)	0.053	(0.067)
LOCAL	0.032	(0.070)	0.012	(0.077)	-0.026	(0.077)
SCREEN	-0.071	(0.053)	-0.081	(0.058)	-0.044	(0.058)
ARBIT	0.11 ^c	(0.06)	0.12 ^c	(0.07)	0.074	(0.067)
JUA	0.034	(0.092)	0.026	(0.101)	-0.011	(0.10)
SELINS	-0.009	(0.082)	-0.065	(0.090)	-0.060	(0.090)
T75	0.38 ^a	(0.07)	0.31 ^a	(0.073)	0.45 ^a	(0.073)
T76	0.19 ^a	(0.06)	0.17 ^b	(0.07)	0.21 ^a	(0.07)
T77	-0.064	(0.06)	0.069	(0.066)	0.076	(0.066)
Constant	-0.070		-0.075		-0.081	
	$R^2 = 0.21$		$R^2 = 0.14$		$R^2 = 0.23$	
	$F(17,174) = 2.8$		$F(17,174) = 1.7$		$F(17,174) = 3.1$	

a. Statistically significant at the 1% level (two-tailed test).

b. Statistically significant at the 5% level (two-tailed test).

c. Statistically significant at the 10% level (two-tailed test).

implying that a doctor who does no surgery also is made to face a higher premium when the surgery rate rises. The coefficient for *LAWPOP* (the lawyer ratio) always exceeds its standard error, and it is statistically significant when the time and state binaries are dropped (regression #3).

One reason for the positive signs on the legislative response coefficients may be that states with a serious problem—i.e., those with high premiums—were more likely to enact remedial legislation. Analysis of the annual growth rate in real premiums, the dependent variable in Table 3, should be much less subject to this selectivity problem. But the legislative variables in this table, viewed collectively, have no impact on premium inflation. In fact, excluding the time variables, the *F*-statistic for the equation never exceeds 0.63, far below conventional levels of statistical significance. Regressions including changes in control variables *Y* through *MEDPOP*, not shown here, are similar to those reported in Table 3.

A Brief Discussion

Whereas many of the potential sources of premium inflation are national in scope, deliberate action has been undertaken mostly at the state level. The empirical results of the study presented here give no indication that individual state legislative actions, or actions taken collectively, have had their intended effects on premiums.⁴⁷ The publicity resulting from considerable legislative activity may have made juries and perhaps potential plaintiffs more aware of the cost consequences of malpractice suits. If so, this effect probably extended beyond the boundaries of any particular state.

Another possibility is that past frequency of claims and size distribution of settlements in a state are only weakly related to premiums in the state. Premiums are set on the basis of expected outlays, and insurers may not have based their expectations for the future on past experience. Unfortunately, state-specific data on claims frequency and dollar amounts of settlements are not available for 1974 and thereafter. However, correlations among 1974 premiums, claims filed, cases won by plaintiffs, and mean size of awards for 1970 are surprisingly low (0.3 or less).⁴⁸ Certainly, adverse insurer experience in a given year should be reflected in higher premiums in later years, so that higher correlations were anticipated. There is a need for more "hard" empirical evidence on how insurers really form expectations and set premiums.

Finally, lawyers are often held accountable for the increased tendency to seek legal recourse. Even though the lawyer variable is insignificant in regressions containing binary variables for states, the sign on the lawyer coefficients remains positive and substantial in size. Without the state binary variables (see regression #3, Table 2), the lawyer variable has a positive impact on premiums, significant at the one-percent level. Viewing the empirical evidence in its entirety, the notion that a 10 percent increase in a state's lawyer/population ratio leads to almost a like percentage increase in premiums, as the coefficients imply, is a distinct possibility.

Notes

1. See N. T. Greenspan, "A Descriptive Analysis of Medical Malpractice Insurance Premiums, 1974-1977," *Health Care Financing Review* 1 (Fall 1979): 65-71, for 1974-77 trends. Pre-1974 data on premiums are available from M. C. Kendall, "Expectations, Imperfect Markets, and Medical Malpractice Insurance," in *The Economics of Medical Malpractice*, ed. Simon Rottenberg (Washington, D.C.: American Enterprise Institute, 1978), p. 176.
2. There are numerous accounts of legislative responses; a few document court decisions in this area. See, for example, K. S. Abraham, "Medical Malpractice Reform: A Preliminary Analysis," *Maryland Law Review* 36 (No. 3, 1977): 489-531; American Arbitration Association, *Statutory Provisions for Binding Arbitration of Medical Malpractice Claims* (Washington, D.C.: U.S. National Center for Health Services Research, DHEW Pub. No. (HRA) 77-3165, October 1976); American Medical Association, "State Health Legislation Report," May 1977; American Medical Association, "Selected Important Court Decisions Relating to Medical Malpractice Legislation" (Chicago: AMA, Public Affairs Division, 1 December 1978); P. E. Carlin, "A Snapshot of State Legislative Enactments in the 1970 Sessions Relating to Malpractice" (Washington, D.C.: George Washington University, Intergovernmental Health Policy Project,

- mimeo, 1980); Editors, *Duke Law Journal*, "Comment: An Analysis of State Legislative Responses to the Medical Malpractice Crisis," in *Medical Malpractice: The Duke Law Journal Symposium* (Cambridge, Mass.: Ballinger, 1977), pp. 241-92; B. J. Jacobs, "Overview of State Legislation Pertaining to Professional Liability of Physicians," *Clinical Obstetrics and Gynecology* 20 (March 1977): 25-54; S. Law and S. Polan, *Pain and Profit: The Politics of Malpractice* (New York: Harper and Row, 1978); A. J. Lipson, *Medical Malpractice: The Response of Physicians to Premium Increases in California* (Santa Monica, Calif: Rand Corporation, #R-2026-PSEC, November 1976); Medical Liability Commission, *Legislative Index for Health Services Research* (Rockville, Md.: U.S. National Center for Health Services Research, December 1976); M. H. Redish, "Legislative Response to the Medical Malpractice Insurance Crisis: Constitutional Implications," *Texas Law Review* 55 (May 1977): 759-800; R. E. Stromberg, "Case Law Update" (San Francisco: National Health Lawyers Association, mimeo, May 1979); D. G. Warren and R. Merritt, eds., *A Legislator's Guide to the Medical Malpractice Issue* (Washington, D.C.: Georgetown University, Health Policy Center, 1976).
1. *Medical World News*, "New York State Doctors are Threatened with Staggering Increases in Malpractice Premiums," 25 May 1981, pp. 18-19.
 2. According to American Medical Association, *SMS Report* (Vol. 1, October 1982), malpractice premiums did not rise in real terms between the mid-1970s and the early 1980s. Also see E. K. Adams and S. Zuckerman, "Variation in the Growth and Incidence of Malpractice Claims," *Journal of Health Politics, Policy and Law* 9 (Fall 1984): 475-488.
 3. See, for example, C. L. Rosenberg, "Why a New Malpractice Crisis is Coming," *Medical Economics*, 28 April 1980, pp. 109-14; and *Medical World News*, 1981.
 4. Greenspan, "A Descriptive Analysis," p. 66.
 5. U.S. Department of Health, Education, and Welfare, *Medical Malpractice Claims* (Washington: U.S. Department of Health, Education, and Welfare, Pub. No. HCFA-02108, 20 October 1978), Table 4-18; S. R. Henderson, "The Malpractice Insurance Situation and its Effects on Medical Practice," in *Profile of Medical Practice*, 1978, ed. J. C. Gaffney (Chicago: American Medical Association, 1979), p. 10; and American Medical Association, *SMS Report*.
 6. The source is unpublished data from Nancy Greenspan, Health Care Financing Administration; premiums are for a "standard" \$100,000/\$300,000 policy.
 7. See, especially, All Industry Medical Malpractice Insurance Committee, "The Problems of Insuring Medical Malpractice" (Hartford, Conn.: Aetna Life and Casualty, mimeo, November 1975); and Kendall, "Expectations."
 8. M. W. Reder, "Medical Malpractice: An Economist's View," *American Bar Foundation* 1976 (No. 2, 1976): 511-63.
 9. Ibid.; and M. W. Reder, "An Economic Analysis of Malpractice," *Journal of Legal Studies* 5 (No. 2, 1976): 267-93. Although the direction of effect cannot be determined a priori, there are strong conceptual arguments for including per capita income. The role of operations per surgeon is much less clear. Since most suits may be traced to care rendered in the hospital, and a high proportion to surgery in particular, there is reason for including a variable representing hospital and/or surgical activity. See M. H. Rudov, T. I. Myers, and A. Mirabella, "Medical Malpractice Insurance Claims Files Closed in 1970," in *Appendix to Report of the Secretary's Commission on Medical Malpractice* (Washington, D.C.: U.S. Government Printing Office, DHEW Pub. No. (OS) 73-89, 16 January 1973), pp. 1-25; and U.S. Department of Health, Education, and Welfare, *Medical Malpractice Claims*, several tables. However, the ratio of operations to surgeons may be high in states with few operations but with even a greater scarcity of surgeons. Also, since practice seems to make perfect, a high workload may be associated with higher rather than lower quality. See, for example, A. B. Flood, W. R. Scott, and W. Ewing, "Does Practice Make Perfect? Part I: The Relationship Between Hospital Volume and Outcome or Selected Diagnostic Categories," *Medical Care* 22 (February 1984): 98-114.
 10. R. Feldman, "Determinants of Medical Malpractice Incidents: Theory of Contingency Fees and Empirical Evidence," *Atlantic Economic Journal* 7 (July 1979): 59-65.
 11. Both Reder and Feldman took their legal variables from S. Dietz, C. B. Baird, and L. Berul, "The Medical Malpractice Legal System," in *Appendix to Report of the Secretary's Commission on Medical Malpractice*, pp. 87-167.
 12. J. F. Hastings, "Medical Malpractice Background Papers," in *An Overview of Medical Malpractice*, 94th Congress, U.S. House of Representatives, Committee on Interstate and Foreign Commerce (Washington, D.C.: U.S. Government Printing Office, 17 March 1975), pp. 3-49; All Industry Medical Malpractice Insurance Committee, "Problems of Insuring Medical Malpractice"; Law and Polan, *Pain and Profit*; P. Munch, "Causes of the Medical Malpractice Insurance Crisis: Risks and Regulations," in Rottenberg, ed., *The Economics of Medical Malpractice*.
 13. Law and Polan, *Pain and Profit*, p. 171.
 14. See, for example, Rosenberg, "Why a New Malpractice Crisis."
 15. See, for example, American Medical Association, "Selected Important Court Decisions."
 16. Editors, *Duke Law Journal*, "Comment"; and Editors, *Northwestern Law Review*, "The Application of Res Ipsa Loquitur in Medical Malpractice Cases," *Northwestern Law Review* 60 (January-February 1966): 852-75.
 17. Editors, *Duke Law Journal*, "Comment," p. 252; American Medical Association, "Selected Important Court Decisions."
 18. U.S. Department of Health, Education, and Welfare, *Medical Malpractice Claims*, p. v-7.
 19. All Industry Medical Malpractice Insurance Committee, "Problems of Insuring Medical Malpractice."
 20. U.S. Department of Health, Education, and Welfare, *Medical Malpractice Claims*, p. v-6.
 21. Exceptions are listed in Editors, *Duke Law Journal*, "Comment," pp. 254-5.
 22. See, for example, Dietz, Baird, and Berul, "Medical Malpractice Legal System"; and American Surgical Association, "Statement on Professional Liability, September 1976," *New England Journal of Medicine* 295 (2 December 1976): 1292-6.
 23. Feldman, "Determinants of Medical Malpractice Incidents."
 24. Editors, *Duke Law Journal*, "Comment," p. 268.
 25. American Medical Association, *State Health Legislation Report*, p. 4.
 26. Abraham, "Medical Malpractice Reform."
 27. American Medical Association, *State Health Legislation*.
 28. For further discussion, see Abraham, "Medical Malpractice Reform."
 29. Recent court cases are listed in American Medical Association, "Selected Important Court Decisions." See A. R. Holder, *Medical Malpractice Law*, 2nd Edition (New York: John Wiley and Sons, 1978), pp. 403-18, for a description of screening panels.
 30. Abraham, "Medical Malpractice Reform."
 31. Ibid., p. 577. Arbitration panels may in fact be more lenient. See W. Wadlington, "Alternatives to Litigation, IV: The Law of Arbitration in the U.S.," in *Appendix to Report of the Secretary's Commission on Medical Malpractice*, pp. 346-423. More favorable empirical evidence on cost-effectiveness of arbitration is presented in D. H. Heintz, "Arbitration of Medical Malpractice Claims: Is It Cost Effective?" *Maryland Law Review* 36 (1977): 533-65. Arbitration has encountered opposition from trial lawyers. See C. L. Rosenberg, "Which Malpractice Reforms Protect You Best?" *Medical Economics*, 28 April 1980, pp. 148-67.
 32. Redish, "Legislative Response."
 33. See American Medical Association, *State Health Legislation Report*, p. 10.
 34. R. W. Rhein, "Malpractice: Grim Outlook for '76," *Medical World News*, 12 January 1976, pp. 71-83.
 35. See American Medical Association, *State Health Legislation Report*, p. 11; and *Medical World News*, "Malpractice '77: 50-State Picture Improves," 10 January 1977, pp. 21-3.
 36. See Reder, "An Economic Analysis"; Reder, "Medical Malpractice"; and Feldman, "Determinants of Medical Malpractice Incidents."
 37. The state index is described in F. A. Sloan, "Physician Supply Behavior in the Short Run," *Industrial and Labor Relations Review* 28 (July 1975): 549-69.
 38. Premium data came from the Telephone Survey of Malpractice Insurance Companies conducted by the Health Care Financing Administration. See Greenspan, "A Descriptive Analysis," for a brief description of the Survey. The first figure of the liability limit (\$100,000 above) represents the annual limit per case; the second is the annual limit for all cases against the provider.
 39. See F. A. Sloan and J. Lorant, "The Allocation of Physicians' Services: Evidence on Length-of-Visit," *Quarterly Review of Economics and Business* 16 (Autumn 1976): 85-103; and F. A. Sloan and J. Lorant, "The Role of Waiting Time: Evidence from Physicians' Practices," *Journal of Business* 50 (October 1977): 486-507.
 40. It is also true that utilization rates rise. To the extent that some "unnecessary" care is given, patients may be more likely to sue.

43. Feldman's index is similar to Roder, "Medical Malpractice."
44. "Legislative Response" variables are based on sources listed in Note 2 above.
45. The correlations are presented in Vanderbilt University, *Analysis of Survey Data on Physician Practice Costs and Incomes* (Nashville: Vanderbilt University, Health Policy Center, 1981, Final Report, Contract No. HCFA 500-78-0018 with the U.S. Health Care Financing Administration), p. 180.
46. Since Y through MDPOP are all continuous variables, associated coefficients are elasticities.
47. Many observers at the time were quite optimistic. See, for example, C. E. Welch, "Medical Malpractice," *New England Journal of Medicine* 292 (26 June 1975): 1372-76.
48. The 1970 data were used in Feldman, "Determinants of Malpractice Incidents." I am grateful to Roger Feldman for making these data available for my study.

State Rates of Cost of Malpractice

John Holahan

Abstract. The business of different states has produced considerable evidence that nursing-home costs are found to have low consistent differences in efficiency incentives appear to be very important in prospective systems high percentile cost containment inflation inherent weaknesses offset by low per-

Introduction

Financing nursing care and needing care are more than double billion to \$24.2 18.6 percent from purpose of this nursing-home costs.

Of the two purposes of care—Medicaid effect on costs and reimbursement rate of change in percent of the cost influence on the considerable inflation in the industry as a

In order to analyze

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Policy and Law*