

## INCENTIVE EFFECTS OF MEDICAL MALPRACTICE†

### The Effects of Malpractice Litigation on Physicians' Fees and Incomes

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For many years physicians and other medical providers in the United States have been subject to a negligence rule of liability. Under a negligence rule, patients who suffer an adverse outcome are entitled to compensation if they can show that they incurred an injury that was caused by the physician's failure to take due care, defined as departure from the customary standard of care of physicians in good standing in the profession. The traditional tort standard of damages is full compensation for monetary and nonmonetary loss.

There have been no major doctrinal shifts in the law expanding liability for medical malpractice over the last decade—indeed, many states have enacted tort reforms designed to reduce the number and size of claims. Nevertheless, from 1975 to 1984, claims per physician rose at an average rate of 10 percent a year; between 1982 and 1986 claim frequency per 100 physicians rose from 13.5 to 17.2 a year. (See Danzon, 1988, and sources cited therein.) Claim severity (average amount per paid claim) increased at roughly twice the rate of the CPI from 1975 to 1984. In 1984, the median and mean

payment were \$18,000 and \$80,741, respectively. There remain large differences among states and among specialties in claim frequency and severity.

Costs of malpractice insurance have also increased dramatically, but more erratically than claims costs. Following the malpractice "crisis" of the mid-1970s, when rates increased by over 300 percent in a single year in some states, rates remained stable or actually fell in the late 1970s, but resumed an upward trend in the 1980s. Between 1977 and 1984, rates for basic limits of coverage increased by 109 percent for the lowest-risk specialists, such as GPs doing no surgery, 180 percent for obstetricians, and 189 percent for the highest-risk surgical specialists.

Although malpractice insurance is still less than 2 percent of total health care expenditures, many observers argue that medical malpractice is a major factor contributing to rising health care costs. One implication of such arguments is that virtually all the cost is borne by patients. This seems at odds with arguments made by others, that a significant fraction of physicians are giving up practice, or at least high-risk procedures, because of liability.

Full and automatic pass-through of costs is also potentially at odds with the deterrent purposes of the negligence rule of liability, which is to correct the potential underprovision of care in a market with asymmetric information and systematic underestimate of risk by consumers. With a shift from no liability to a perfect negligence system, we might observe an increase in preventive measures by physicians, an increase in prices, and an increase in gross revenues. This would occur *if* patients perceived the improvement in quality and valued it at cost, and the

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system had been nonoptimal without liability—but nonoptimality is inconsistent with fully informed patients.<sup>1</sup> With imperfect information on the part of courts, liability insurers, and consumers, the incidence and incentive effects of the tort system are uncertain a priori and become an empirical question.

In this paper we discuss some of the theoretical and empirical issues in estimating the effects of malpractice litigation on physicians' fees and incomes and summarize some new empirical estimates.

### I. Effects of Malpractice on Physician Pricing in the Short Run

Assume that cross-sectional differences and the intertemporal increase in claim frequency and severity reflect changes in the legal system that increase the probability and expected size of a malpractice recovery for the plaintiff, conditional on the occurrence of an injury.<sup>2</sup> Let us characterize the "generosity" of the legal regime by an index  $J$ .

Malpractice litigation creates two types of cost for physicians: the cost of claims and legal defense that can be covered by insurance; and the cost of own time in claim defense, loss of reputation, anxiety, etc. that are uninsurable. Under current methods of rating malpractice insurance, the cost of insurance depends on the physician's specialty, limits of coverage, whether or not certain high-risk procedures are performed at all (for example, any surgery by GPs, obstetrics

by OB/GYNs) and the decision to practice full or part-time. Given these basic practice choices, the premium is a fixed cost, independent of number of patient contacts.<sup>3</sup> The uninsured costs are a marginal per patient cost equal to the expected cost if sued. This marginal cost increases with claim frequency and severity. On the other hand, if physicians maximize utility rather than profit, an increase in premiums that reduces net income should lower the physician's implicit opportunity cost of time, assuming leisure is a normal good. In that case, an increase in  $J$  should lower marginal cost. An increase in  $J$  may also affect patients' demand for care, if patients perceive and value any risk-reducing measures taken by physicians, or if they perceive and value any increase in the probability or amount of compensation if injured.

How does an increase in  $J$  affect physicians' prices and net incomes? Consider the simple case where firm-level demand is not affected by changes in potential malpractice awards and the physician-firm is a profit maximizer operating in a monopolistically competitive market (Pauly and Mark Satterthwaite, 1981). Further assume that long-run equilibrium requires the equalization of (real) net incomes across market areas.

We consider two basic models of the process of adjustment to market equilibrium following an increase in  $J$ . At one extreme, physicians simply purchase higher limits of coverage but do not otherwise change their practice patterns. There is full incidence of the increased insurance and uninsured costs on physicians and hence a sharp reduction in net incomes and even larger reduction in utility. This would be a short-run equilibrium if physicians are profit maximizers and the changes in premiums are viewed as a fixed cost.

<sup>1</sup>If patients perceive the average quality of care but not the care of individual physicians, then full pass-through of the costs of additional care under a perfect negligence rule may be possible, even though market forces alone would create suboptimal incentives for care.

<sup>2</sup>For an analysis of the effects of legal, medical, and demographic factors on the frequency and severity of malpractice claims by state, see Danzon (1984; 1986). California data for 1974 indicate that, at most, 1 in 10 injuries due to negligence led to a claim and 1 in 25 received compensation. Thus some increase in claim frequency is possible without assuming a change in the rate of negligence or a pro-plaintiff shift in the law.

<sup>3</sup>Although explicit experience rating is not widespread, implicit experience rating occurs because physicians with very poor claims records may face restrictions on their practice or be denied coverage by more selective insurers who charge lower premiums. Periods of sharply rising premiums marketwide are usually accompanied by a tightening of underwriting standards.

In long-run equilibrium, stable differences in  $J$  must be reflected either in price levels or in differences in "quality" that are cost saving to physicians, assuming equalization of (real) net income per physician across market areas. Physician migration is expected to be the primary equilibrating device in this first model if premiums are treated as a fixed cost by individual profit-maximizing physicians and increases in malpractice litigation do not raise marginal costs due to (implicit) expected uninsured costs.

In the second model, an increase in  $J$  does significantly raise physicians' perceived marginal costs and trigger an increase in prices in the short run that could exceed the increase in marginal cost.<sup>4</sup> Assuming that the market for physicians' services is monopolistically competitive, the profit-maximizing change in price is

$$(1) \quad dP/dJ = [dMC/dJ][1 + (1/ED)]^{-1}$$

where  $MC$  is marginal cost and  $ED$  is the firm-level price elasticity of demand, assumed constant. Price may increase by more or less than  $MC$  depending on  $ED$ . For example, using Thomas McCarthy's (1985) rough estimate of  $-3$  for demand elasticity, price will rise by  $3/2$  times any increase in marginal cost. However, if demand becomes more elastic as price rises (for example, if demand is linear), then price may rise by an amount less than or equal to marginal cost.

But, if the increase in  $J$  affects all physicians in an area equally, then the final effect on prices and incomes depends on market demand, not the individual firm demand elasticity. If the market demand elasticity is low, the final outcome can be an increase in price with minimal reduction in quantity, almost no change in gross or net income, and hence almost no migration. This combination of relatively elastic demand at the firm level but inelastic demand at the market

level is a reasonable conjecture for physician services markets.

There are alternative assumptions that would yield the same short-run effect on price. The physician services market might be characterized as oligopolistic, and the increase in fixed costs might be used as a signal to raise prices. Alternatively, if insurers rapidly and automatically incorporate premium cost increases into their reimbursement levels, institutional mechanisms could facilitate a rapid adjustment in fee levels such that physician incomes are protected from even short-run incidence and there is no strong stimulus to adjustment of physician stocks.

## II. Data

The data used in this study are from the 1976, 1978, and 1983 surveys of Physicians' Practice Costs and Incomes (PPCI), conducted for the Health Care Financing Administration. Each of these surveys occurred at a different point in the malpractice insurance "cycle." The 1976 survey follows two years of rapidly rising premium rates; in the two years prior to the 1978 survey, rates were flat or falling. Beginning in 1980, rates then began to rise again.<sup>5</sup> These data permit both cross-sectional and time-series (first difference) analysis of the relationship between physicians' fees, reimbursement levels, and incomes, on the one hand, and measures of the malpractice climate on the other.

We use three measures of the "malpractice climate": state-level claim frequency per physician, state-level claim severity (average payment per paid claim), and the rate charged by the leading malpractice insurer in the state for basic limits coverage. This rate is not a fully accurate measure of the relevant price of insurance because the majority of physicians buy excess limits of coverage, for which rates are nonlinear, but fairly uniform across states. Claim frequency is a

<sup>4</sup>Another alternative not addressed here is that physician outflow may reduce physician inputs and quality per unit of output, or some combination of price increases and quality decreases.

<sup>5</sup>The later 1986 PPCI survey follows the very sharp premium increases of the mid-1980s, but unfortunately does not contain data on prices.

proxy for the uninsured time costs of being sued. Potential claim severity would be a measure of exposure in excess of basic limits, but is imperfectly measured by *observed* severity because the latter tends to be inversely correlated with claim frequency. Controlling for claim frequency and claim severity, the premium rate is a proxy for the loading charge for claim defense, administration, and profit, and any discrepancy between prior claim frequency and severity and expected future claim costs. Since all three measures are potential proxies for different dimensions of the malpractice climate, all three are included in the empirical analysis reported here. An alternative specification uses the individual physician's actual expenditure on malpractice insurance, treated as endogenous. The analysis controls for other relevant market area characteristics that are expected to affect physicians' fees and incomes.

### III. Empirical Results:

#### A. Cross Section

In all three years, the cross-section evidence shows a strong positive relationship between the various measures of the malpractice climate and physicians' fees (Table 1).<sup>6</sup> The elasticity with respect to the physician's (endogenous) expenditure on malpractice insurance is roughly .16 for office visit fees, and between .09 and .17 for hospital visit fees. The pattern across years does not support the hypothesis of delayed response of fees. This hypothesis would predict a larger positive relationship between fees and rates in 1978 (when physicians had several years to adjust prices to the sharp rate increases in 1974-76) than in 1976 or 1983 which immediately followed sharp rate increases. Controlling for the rate for basic limits coverage, high claim severity is associated with higher fees, whereas the coefficient on claim frequency is generally negative or

TABLE 1—CROSS-SECTION RELATIONSHIP  
BETWEEN MALPRACTICE MEASURES  
AND FEES

Variable	1976	1978	1983
A. Dependent variable: Usual charge for office visit (Ln)			
RATE (Ln)	0.105 (10.22)	0.103 (10.49)	0.113 (6.74)
CLAIM SEVERITY (Ln)	0.028 (1.88)	0.040 (3.47)	0.022 (2.14)
CLAIM FREQUENCY	-0.006 (-1.70)	0.003 (0.80)	-0.113 (-3.16)
PREMIUM* (Ln)	0.155 (8.82)	0.165 (9.52)	0.176 (6.52)
B. Dependent variable: Usual charge for hospital follow-up visit (Ln)			
RATE (Ln)	0.039 (2.98)	0.047 (3.71)	0.110 (4.46)
CLAIM SEVERITY (Ln)	0.087 (4.23)	0.060 (3.91)	0.015 (0.99)
CLAIM FREQUENCY	0.014 (2.91)	0.01 (2.12)	0.016 (0.31)
PREMIUM* (Ln)	0.140 (5.98)	0.085 (3.96)	0.173 (4.59)

Note: Regression coefficients and *t*-statistics are shown in parentheses.

\*Two-stage least squares.

insignificant for office visit fees, and positive for hospital visit fees.

The magnitude of the price elasticities suggests more than a full pass-through of the costs of insurance. There are several possible explanations for this. First, as discussed earlier, an increase in marginal cost can result in a more-than-proportional increase in price if market demand is inelastic and physicians act as profit-maximizing monopolistic competitors; or if third-party payers rapidly adjust reimbursement rates, as they appear to have done. Second, if physicians are utility maximizers and derive significant negative utility from the threat of being sued, they would require positive compensating income differentials to remain in practice. A third possibility is an increase in "quality," such as time per visit. Preliminary analysis does show some evidence of increased time per visit.

<sup>6</sup>Full equations are reported in our 1990 paper.

The elasticities of usual reimbursement paid by "the highest paying" Blue Shield and commercial insurer in the area and by Medicare are broadly similar to the elasticities for physicians' usual charges. However, the ability to pass-through malpractice costs to Medicaid reimbursement is more limited and appears to diminish over time, with a negative relationship by 1983. This is consistent with the general tightening of Medicaid limits on physician reimbursement in the 1980s.

When the sample is pooled across specialties, the relationship between malpractice variables and net incomes is consistently positive, although weaker in 1983 than in the earlier years. This effect largely disappears when the data are disaggregated by specialty, suggesting that pooling across specialties induces a spurious positive correlation between net income and the specialty-specific malpractice rate, even with specialty dummies included in the estimating equation.

These cross-sectional results are consistent with a model of the adjustment process in which there are significant positive and rapid adjustments in prices and reimbursement levels, and no significant negative effects on net income.

### B. Time-Series

To distinguish between the models of adjustment via changes in physician stocks, on the one hand, and rapid adjustment of prices on the other hand, we performed two types of tests. First, we reestimated the cross-section equations treating county-level physician stocks as endogenous. The results were essentially unchanged. We also tested for the effect of *changes* in the malpractice variables on *changes* in physician stocks, and found no significant effects. Doctors did not leave (or choose to avoid) states whose malpractice climates worsened, relative to other states.

Second, we examined the relationship between changes in our measures of the malpractice threat and the contemporaneous change in net incomes, prices, and hours over the seven-year period, 1976-1983. Since the individual physician data are not in the

form of a panel, we cannot examine first differences at the level of the individual practice. Instead, we calculate sample average values for observations grouped into the 72 malpractice insurance rating territories, and take first differences in those averages. Because the sample number of physicians per territory varies, results are reported using means weighted by the number of physicians in the territory. To control for changes in other area characteristics that might affect fee levels, we include the change in the predicted value of Medicare prevailing charges for four physician services: GP office visits and hospital visits, hysterectomies, and cholecystectomies. Because of the exploratory nature of this analysis, we discuss the results of stepwise analysis, with a selection significance level of 0.15.

The first difference in malpractice premium rates is positively associated with the change in average fees for office visits and for follow-up hospital visits, with significance at better than the 0.1 level. Other significant covariates of fee changes have the expected signs. None of the malpractice variables was significant in explaining the change in net income or changes in insurers' reimbursement rates. For the 1976-78 period, during which malpractice premiums generally fell, the positive association between the malpractice variables and fees did not hold, suggesting that even if fees adjust rapidly upward, they are sticky downward. There was also no evidence of income decline associated with the malpractice variables.

In conclusion, the evidence from the 1976-83 period is consistent with the increase in malpractice costs being passed on fairly rapidly in higher fees, with little negative effect on physician net incomes on average or adjustment in physician stocks across market areas. We emphasize that these conclusions are based on data that predate the sharp increase in malpractice premiums in the mid-1980s. The pass-through of these later cost increases may have been much less rapid because of the more competitive market for physician services and more aggressive cost-control practices of third-party payers. Second, finding no evidence of effects on mean net incomes does not preclude

significant effects for individual physicians and adjustment of physician stocks or service flows within insurance rating territories.

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