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Negligent Care and Malpractice Claiming Behavior in Utah and Colorado

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Background. Previous studies relating the incidence of negligent medical care to malpractice lawsuits in the United States may not be generalizable. These studies are based on data from 2 of the most populous states (California and New York), collected more than a decade ago, during volatile periods in the history of malpractice litigation.

Objectives. The study objectives were (1) to calculate how frequently negligent and nonnegligent management of patients in Utah and Colorado in 1992 led to malpractice claims and (2) to understand the characteristics of victims of negligent care who do not or cannot obtain compensation for their injuries from the medical malpractice system.

Design. We linked medical malpractice claims data from Utah and Colorado with clinical data from a review of 14,700 medical records. We then analyzed characteristics of claimants and nonclaimants using evidence from their medical records about whether they had experienced a negligent adverse event.

Measures. The study measures were negligent adverse events and medical malpractice claims.

Results. Eighteen patients from our study sample filed claims: 14 were made in the absence of discernible negligence and 10 were made in the absence of any adverse event. Of the patients who suffered negligent injury in our study sample, 97% did not sue. Compared with patients who did sue for negligence occurring in 1992, these nonclaimants were more likely to be Medicare recipients (odds ratio [OR], 3.5; 95% CI [CI], 1.3 to 9.6), Medicaid recipients (OR, 3.6; 95% CI, 1.4 to 9.0), ≥75 years of age (OR, 7.0; 95% CI, 1.7 to 29.6), and low income earners (OR, 1.9; 95% CI, 0.9 to 4.2) and to have suffered minor disability as a result of their injury (OR, 6.3; 95% CI, 2.7 to 14.9).

Conclusions. The poor correlation between medical negligence and malpractice claims that was present in New York in 1984 is also present in Utah and Colorado in 1992. Paradoxically, the incidence of negligent adverse events exceeds the incidence of malpractice claims but when a physician is sued, there is a high probability that it will be for rendering nonnegligent care. The elderly and the poor are particularly likely to be among those who suffer negligence and do not sue, perhaps because their socioeconomic status inhibits opportunities to secure legal representation.

Key words: medical malpractice; negligence; claims. (Med Care 2000;38:250–260)

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The main objectives of medical malpractice law are to compensate patients who are injured by negligence and to improve the quality of medical care.[1] Its ability to deliver on these goals has long been questioned.[2–4] However, the criticisms vary considerably, typically reflecting the perspective of different participants in the health care system. For example, physicians complain that malpractice law is deeply flawed because suits strike haphazardly, unrelated to quality of care.[5,6] Many attorneys argue that regulatory interference, such as caps on their fees and compulsory arbitration panels, frustrates the litigation process and causes much medical negligence to go unscrutinized.[7,8] Patients emphasize the formidable stature of physicians as opponents or the reluctance of providers to disclose information about instances of substandard care.[9,10]

See p 247 and p 261

These different perspectives are not necessarily incompatible; available evidence on malpractice claiming behavior provides some support for each. Recent empirical investigations of the relationship between quality of care and malpractice claims have tended to adopt 1 of 2 different perspectives.[11] One perspective focuses directly on the operation of the malpractice system through retrospective review of malpractice claims files[12–14]; thus, it is "claims oriented." A second perspective is "injury-oriented"; it involves measuring the incidence of medical injuries at their source in the health care setting and then tracking subsequent claiming patterns. In this study, we pursue the latter approach.

Two previous studies have examined the relationship between negligence and claiming behavior with reference to the underlying rate of medical injury caused by negligence. Danzon[1] compared data from a review of medical records in California in 1974[15] with closed malpractice claims and concluded that the incidence of adverse events resulting from negligence exceeded the number of claims filed by a factor of ~10:1.[1] Using a similar approach, the Harvard Medical Practice Study reviewed a sample of New York hospital records from 1984[16] and found a negligent adverse events to claims ratio of ~8:1.[17] By matching individual clinical records with claims data in New York, Localio et al[17] estimated further that <2% of negligent injuries were followed by claims in the relevant period.

Although the results from the studies in California and New York are fairly consistent, their generalizability is questionable. The California study was conducted in the mid-1970s at the height of a medical malpractice crisis in the United States[1]; another major surge in claims rates and premiums occurred in the mid-1980s[4] at the same time data were collected for the study in New York. The relationship between substandard care and claiming behavior has not been analyzed in a period of relative calm. Furthermore, California and New York are distinctive in ways that could potentially affect the negligence-claims relationship: They are heavily populated, they are among the states with the highest per capita concentrations of lawyers,[18] and both are renowned for having consistently high rates of malpractice litigation.[19]

In this study, we link malpractice claims data from Utah and Colorado—2 states with malpractice environments that differ markedly from California and New York—with clinical data from 14,700 medical records in those states. Together, these 2 data sets permit calculation of how frequently negligent and nonnegligent medical management, as determined by a team of physician-reviewers, led to malpractice claims. We also analyze the "malpractice gap" by comparing patients in Colorado who suffered adverse events caused by negligence in 1992 but did not sue with patients who sued their physician for negligent care allegedly rendered in the same year. In this way, sociodemographic characteristics of both "players" and "nonplayers" in the medical malpractice system can be identified.

Methods

Sampling, Medical Record Review, and Quality Control

The medical injury data used in this analysis consisted of the adverse events and negligent adverse events detected in a parallel study published in this issue of *Medical Care*.[20] Identification of these events through random sampling of 15,000 hospital discharges from calendar-year 1992 (5,000 in Utah, 10,000 in Colorado), two-stage record review by trained nurses and physician-reviewers, and quality control strategies are described in the previous article.[20] We defined adverse events as injuries caused by medical man-

agement, as distinct from any underlying disease process, which either prolonged hospital stay or caused disability at discharge. Negligent adverse events were defined, in accordance with standard tort criteria, as actual injuries proximately resulting from a treating physician's failure to meet the standard expected in his practice community.[21]

The physician-reviewers' confidence that an adverse event had occurred was graded on a 6-point confidence scale.[20] If adverse event criteria were met, an analogous but separate scale elicited reviewers' confidence about evidence of negligence in the medical management. The threshold for both determinations was a confidence score of 4 ("more likely than not") or greater.[20]

Identification of Claims

We defined a "claim" as a demand by a patient for compensation for an alleged injury arising out of medical care—the same definition used in the Harvard Medical Practice Study.[22] Initiation of formal litigation was not required to meet our definition of a claim. However, we excluded "potential" claims from our analysis; these are claims files opened by medical malpractice insurers on the basis of an incident report or expectation that a suit will follow, rather than in response to an actual demand for compensation.

Claims data were obtained directly from medical malpractice insurers operating in Utah and Colorado. In Utah, we collected data on claims filed during the period 1992 through 1996 from the state's 3 major medical malpractice insurers (Utah Medical Indemnity Association, Intermountain Health Care, and University Hospital). Together these insurers are responsible for ~80% of all malpractice policies written in Utah annually. In Colorado, we collected 1992 through 1996 claims data from COPIC, an insurer responsible for ~75% of all malpractice policies written in Colorado annually, and from 3 smaller insurers (University Hospital, Kaiser Permanente, and The Doctors' Company). The combined market share of these 4 insurers in Colorado is ~90%.

To estimate the annual number of claims statewide in Colorado, we took the total number of claims received by the insurers from which we obtained data and adjusted this total upward to account for the portion of the market not observed. In Utah, we combined data from participating insurers with findings from a 1994 study of malpractice prelitigation panels, which had gathered data on annual numbers of prelitigation cases statewide.[23]

Matching Process

All patients in our study population were initially matched to claimants identified in Utah and Colorado with the Automatch software system (Matchware Technologies, Inc) and Soundex. The algorithm Automatch uses to link files has been described[24] and tested[25] previously. Demographic variables used to identify matching claims included claimant name, social security number, date of birth, date of alleged injury, hospital, admission date, and discharge date.

Our initial matching efforts used fairly generous assumptions about the possibility of coincident events. Phonetic name variations and numeric ranges were used to generate a list of potential matching claims. Physician investigators (H.R.B., T.A.B., E.J.T.) then reviewed details of each of these claims. False positives were eliminated by comparing data from the medical record review with available claims data to ensure that (1) the patient and claimant were the same individual and (2) the claim actually related to an episode of care examined during record review.

Construction of Sample for Analyzing Differences Between Claimants and Nonclaimants

Additional data were obtained from the dominant insurer in Colorado (COPIC) on all claims received through 1997 alleging negligent injury in 1992. This information included patient age, gender, zip code, payer status, disability level, and indemnity paid (if any) on the claim. For purposes of analysis, we then categorized disability into 3 levels on the basis of the seriousness of the injury: minor disability (included emotional disability only, insignificant, and minor temporary disability), significant disability (included major temporary, minor permanent, and significant permanent disability), and major disability (included major permanent or grave disability and death).

An indirect measure of household income status was imputed for both claimants and nonclaimants by combining patient 5-digit zip codes with data from the 1990 US census.[26] Each individual

was assigned the mid-point of an income range for the median household within the individual's age group and zip code. All household income values were then categorized on the basis of limits calculated by the US Bureau of the Census in 1992.[27] The income categories were poor ($12,600 or less), low income (between $12,601 and $24,140), middle income (between $24,141 and $58,007) and high income (more than $58,007).

Data Analysis

The medical record sampling design permitted extrapolation from the sample to the population of all patients discharged from Utah and Colorado hospitals in 1992. We estimated the total number of negligent adverse events in each state in 1992, the ratio of negligent adverse events to claims, the proportion of claims that did not relate to an adverse event or negligent adverse event, and the probability of a claim after a negligent adverse event.

We also compared patients from Colorado in our study sample who did not claim despite having suffered a negligent adverse event ($n = 109$) to the sample of Colorado patients who filed a claim relating to an incident alleged to have occurred in 1992 ($n = 256$) and the subset of those claimants who received compensation for their claim ($n = 144$). Multivariate differences between these groups were examined through logistic regression. The covariates included in our model were gender, patient age (<18 years, 18 to 44 years, 45 to 64 years, 65 to 74 years, ≥75 years), payer status (Medicare, Medicaid, uninsured, privately insured), income (poor, low income, high income), and disability (minor, significant, major).

Results

Adverse Events and Adverse Events Resulting From Negligence

We reviewed 4,943 (98.9%) of the 5,000 sampled records in Utah and 9,757 (97.6%) of the 10,000 records sampled in Colorado. The rest were classified as missing.

We detected 587 adverse events, 28.8% (169) of these were in Utah and 71.2% (418) in Colorado.[20] Of these adverse events, 161 were judged by reviewers and verified by investigators to be the result of negligent acts or omissions in the care rendered; 32.3% (52) of these were in Utah and 67.7% (109) in Colorado. When our sample is extrapolated to the state level, we estimate that 1,828 negligent adverse events attributable to hospitalizations in 1992 occurred in Utah, and 3,179 occurred in Colorado. This corresponds to negligence rates of 0.9±0.1% (mean±SD) among hospitalizations in Utah and 0.8±0.1% among hospitalizations in Colorado.

Claims Matched to Study Sample ("Matches")

Sixty-six potential matches between our study population and claimants in Utah were identified. Physician-investigators confirmed that 8 of these related to patients covered by our study and involved consideration of the same episode of care in record review as subsequently gave rise to the medical malpractice claim. Seventy-four potential matches were identified in Colorado, leading to 10 matches confirmed in the same way. In 1 case, a sampled hospitalization led to multiple claims for the same alleged event; we counted these claims as a single match.

Analysis of Matches

Table 1 shows characteristics of the matches compared with the full study sample. Although the matched group included a higher proportion of adverse events (44%) and negligent adverse events (22%) than the study sample as a whole (4% and 1%, respectively), only 8 of the 18 matches involved an adverse event. The adverse event was attributed to negligence in 4 claims. Thus, 14 of the 18 claims (78%; 95% CI, 56 to 92) were made in the absence of negligence, and 10 (56%; 95% CI, 33 to 76) were made in the absence of any adverse event.

Of the 10 claims judged not to involve an adverse event on record review, 8 had screened negative in nurse review and were judged not to have met any of the 18 criteria associated with an adverse event. In the 2 cases that screened positive but were then judged not to be adverse events, physician-reviewers found only slight to modest evidence (confidence scale[20] score=2) that management caused the injury in question.

TABLE 1. Descriptive Characteristics of Matched and Study Samples

Patient Characteristics	Claimants Matched to Study Sample	Study Sample
Subjects, n	18	14,700
Female, n (%)	10 (55)	9,077 (61)
Nonwhite, n (%)	3 (16)	3,197 (22)
Mean age, y	36 ± 21	40 ± 27
Median household income, $	30,000	. . .
Adverse events,* n (%)	8 (44)	587 (4)
Negligent adverse events,* n (%)	4 (22)	161 (1)
Payer,† n (%)		
Medicare	1 (5)	3,767 (26)
Medicaid	3 (15)	2,223 (15)
Uninsured	0 (0)	891 (6)
Private/other	13 (75)	7,703 (52)
Disability,*†‡ n (%)		
Minor	1 (25)	279 (48)
Significant	5 (62)	238 (41)
Major	2 (13)	49 (8)

*Statistical difference between matched claimants and study sample at $P < 0.05$ level by use of Fisher's exact and Wilcoxon tests, as appropriate.
†Categories may not add to 100% because of missing values.
‡Adverse events only.

Of the 8 claims judged to involve adverse events, reviewers were virtually certain that an adverse event had occurred in 5 (score=6); they found strong evidence in 2 (score=5); and 1 was a borderline call (score=4). In the 4 claims judged negligent adverse events, reviewers either found strong evidence or were virtually certain of their judgment.

Roughly categorizing the types of claims in our matched group, 7 involved allegations of negligence relating to surgical procedures, and 6 involved allegations of a failure to diagnose or treat. Of the remaining 5 claims, 3 related to perinatal medical management, and 2 related to miscellaneous primary care treatments.

Table 1 shows several other differences between the matched claimants and the full study sample. Although the difference in payer status was not statistically significant overall, there were substantial disparities across several subcategories. Only 1 of the 18 claimants (5%) was a Medicare beneficiary compared with 26% of all patients in the study sample. In addition, adverse events in the matched group resulted in proportionally more significant and major disabilities.

Relative Frequency of Negligence and Malpractice Claims

Table 2 summarizes the relationship between annual incidence of negligent adverse events and malpractice claims. As noted above, we estimate that 1,828 adverse events resulting from negligence occurred in Utah in 1992, and 3,179 occurred in Colorado; 1,028 and 1,552 of these events, respectively, resulted in either significant or major disability. Approximately 361 malpractice claims were filed in Utah relating to injuries allegedly suffered in 1992, while ~476 were filed in Colorado. This represents a negligent adverse event to claims ratio of 5.1:1 in Utah and 6.7:1 in Colorado. When our sample of negligent adverse events is confined to those events resulting in significant or major disability, these ratios are 2.9:1 (Utah) and 3.3:1 (Colorado).

However, the above ratios ignore the fact that only a small portion of the claims in our matched group were judged adverse events caused by negligence. Taking into account that only 4 of the 18 matches were judged to meet the relevant criteria, the probability of a claim after a negligent adverse

TABLE 2. Relationship Between Negligent Adverse Events and Claims

Relationship	Utah, 1992	Colorado, 1992	New York, 1984	California, 1976
Negligent adverse event rate (per 100 discharges)	0.90	0.80	1.00	0.79
Ratio of negligent adverse events to claims	5.1	6.7	7.6	10.0
Probability claim follows negligent adverse event, %	2.5		1.5	...
Claims per 100 physicians per year	7.1	7.3	14.0	17.4

event is 2.5% (95% CI, 0.1 to 4.9). The probability of a claim after a negligent adverse event that caused significant or major disability is 3.8%.

The Litigation Gap: Analysis of Adverse Events Caused by Negligence Not Resulting in Claims

Ninety-seven percent of all adverse events caused by negligence that were detected in our study did not result in malpractice claims (48 in Utah, 109 in Colorado). This can be extrapolated to ~1,782 uncompensated injuries resulting from negligence in Utah in 1992 and 3,100 in Colorado. Sociodemographic and claims resolution data were obtained on 256 claimants in Colorado for purposes of comparison with the 109 nonclaimants identified in that state.

Table 3 shows that the mean age of these negligently injured nonclaimants in Colorado is 19 years older than mean age of patients who sued for medical malpractice that allegedly occurred in 1992. Proportionally, there were 4 times more Medicare patients in the nonclaimant group (58%) and only one third the number of privately insured patients (26%). In addition, nonclaimants were poorer than claimants and less seriously injured overall. The 2 claimant groups were virtually identical (columns 3 and 4, Table 3).

Multivariate analysis confirms that there are substantial sociodemographic and disability differences between the patients who sued for negligence and the patients who were injured by negligence but did not sue (Table 4). Nonclaimants were more likely to have experienced minor disability as a result of their injury (odds ratio [OR], 6.3; 95% CI, 2.7 to 14.9). They were also more likely to be Medicare (OR, 3.5; 95% CI, 1.3 to 9.6) or Medicaid beneficiaries (OR, 3.6; 95% CI, 1.4 to 9.0). Age ≥75 years (OR, 7.0; 95% CI, 1.7 to 29.6) and low income (OR, 2.0; 95% CI, 0.9 to 4.2) were additional characteristics associated with the nonclaimant group.

Table 4 also shows that, compared with successful litigants, nonclaimants were again more likely to have experienced minor disability (OR, 4.5; 95% CI, 1.7 to 11.7) and be Medicare beneficiaries (OR, 4.0; 95% CI, 1.3 to 12.4) or Medicaid beneficiaries (OR, 6.6; 95% CI, 2.1 to 21.2). Age ≥75 years remained significantly associated with nonclaiming (OR, 5.5; CI 1.1 to 27.2), although lower income status was no longer a statistically significant difference.

Discussion

The problematic relationship between occurrence of negligent injury and claiming behavior casts doubt on the ability of the malpractice system to meet either of its key objectives: deterrence of injury-causing medical practice and compensation of patients injured by substandard care.[1] Our results confirm that the relationship between injuries caused by negligence and medical malpractice claims can be described as both lopsided and mismatched.

Previous estimates of the correlations displayed in Table 2 were made in high-litigation states during periods of frenetic malpractice activity.[1,22] But neither the substantially lower claims rates in Utah and Colorado during the period of our study nor the lower rates of injury resulting from negligence appear to affect the degree to which instances of negligent care outstrip malpractice claims. Moreover, lower rates of claims and negli-

TABLE 3. Descriptive Characteristics of Nonclaimants, All Claimants, and Compensated Claimants (Colorado, Incident-Year 1992)

Patient Characteristics	Nonclaimants	All Claimants	Compensated Claimants
Subjects, n	109	256	144
Female, %	59	57	57
Nonwhite, %	25	. . .	. . .
Mean age,* y	60 ± 23	41 ± 18	41 ± 19
Median household income,* $	20,000	30,000	30,000
Negligent adverse events, %	100	. . .	. . .
Payer,* %			
Medicare	58	16	17
Medicaid	11	8	6
Uninsured	5	7	7
Private/other	26	69	70
Disability,* %			
Minor	47	18	21
Significant	42	53	56
Major	11	29	23

*All claimants and compensated claimants statistically different from nonclaimants at the $P < 0.05$ level by use of χ^2 and t tests, as appropriate.

gent injuries appear to have a negligible impact on the accuracy of claiming.

In other words, the poor correlation between negligent incidents and claims present in New York in the mid-1980s was also present in Utah and Colorado in the mid-1990s. Because we have no evidence that this disconnection existed in the mountain states in earlier periods, we are unable to infer that it is insensitive to overall rates of claims and stable across time and regions of the country. However, our findings certainly raise the generalizability of both studies to other states as a plausible prospect.

Studies of the malpractice system conducted elsewhere using claims file review methods lend some support to our findings. For example, Taragin and colleagues[14] used a peer review process to classify 62% of claims against physicians covered by a New Jersey insurance company as defensible. Farber and White[13] reviewed medical records associated with claims brought against a single large hospital and its affiliated physicians; they categorized 42% of these claims as not involving negligence.

Subjecting physicians to meritless malpractice claims is costly, wasteful, burdensome, and unjust. Even physicians who are fully insured will suffer certain uninsurable losses when they are sued, such as lost practice time, damage to reputation, and psychological stress. However, every bit as troubling from a social justice perspective are the many victims of medical negligence who do not file suit and hence are probably never compensated for the economic loss and pain and suffering they experience as a result of their injuries. The overwhelming majority of patients we identified as having suffered negligent injury falls into this category.

Little is known about the identity of this neglected population or why they never come to "name" their loss, "blame" a provider or institution for it, and "claim" compensation through the legal system.[28] Several studies have attempted to detect underrepresented groups in samples of closed malpractice claims and have yielded conflicting results.[29–32] Anecdotal evidence appears to feed a popular perception that the poor are more likely to sue, and a recent study suggests that this perception influences physicians' clinical decision-making.[33] The only direct examination of nonclaimant characteristics, a 1993 study by Burstin et al,[34] found that poor, uninsured, and elderly patients were significantly less likely to claim for malpractice, given the occurrence of a medical

TABLE 4. Multivariate Odds of Failure to Claim Despite Negligence by Sociodemographic Characteristics (Colorado, Incident-Year 1992)

Characteristics	Nonclaimants vs All Claimants (n = 109 and 256, respectively)	Nonclaimants vs Compensated Claimants (n = 109 and 144, respectively)
Female	1.4 (0.8–2.6)	1.7 (0.9–3.2)
Patient age‡		
<18 y	1.0 (0.3–3.3)	0.7 (0.2–2.5)
45–64 y	1.7 (0.8–3.6)	2.2 (1.0–5.0)†
65–74 y	2.2 (0.6–7.3)	2.1 (0.5–8.5)
≥75 y	7.0 (1.7–29.6)*	5.5 (1.1–27.2)*
Payer§		
Medicare	3.5 (1.3–9.6)*	4.0 (1.3–12.4)*
Medicaid	3.6 (1.4–9.0)*	6.6 (2.1–21.2)*
Uninsured	2.0 (0.7–5.8)	3.2 (0.9–10.7)†
Income‖		
Poor	2.0 (0.8–5.3)	2.0 (0.7–5.8)
Low income	2.0 (0.9–4.2)†	2.0 (0.8–4.8)
High income	0.8 (0.3–1.8)	1.0 (0.4–2.5)
Disability¶		
Minor	6.3 (2.7–14.9)*	4.5 (1.7–11.7)*
Significant	1.7 (0.8–3.9)	1.2 (0.5–3.0)

Values in parentheses are 95% CIs.
*P <0.05.
†P <0.1.
‡Reference group was patients aged 18 to 44 y.
§Reference group was privately insured.
‖Reference group was middle income.
¶Reference group was major disability.

injury; however, small sample size (n = 51) in that study thwarted an analysis focused specifically on victims of negligence.

By comparing a representative sample of negligently injured patients who did not sue with a sample of actual claimants, we found that sociodemographic risk factors for being members of this worthy-but-uncompensated group included being poor, uninsured, a Medicare or Medicaid beneficiary, and ≥75 years of age. These risk factors clearly overlap with more general markers of vulnerability and need in the community. For example, the elderly may be said to suffer a kind of "double jeopardy" because they also experience higher rates of medical injury.[20]

How can the strong association of these factors with underclaiming be explained? Economic theories of tort law suggest that individuals who are poor or who do not earn income (whether or not they are poor) will be less likely to sue.[35,36] Malpractice litigation is rarely initiated without attorney involvement; hence, prospective litigants' ability to claim typically hinges on an attorney's willingness to take on their case. Because the financial return accruing to plaintiffs' attorneys in tort cases is generally linked to the size of the award through contingency fees[37] and because lost income typically forms a significant component of malpractice awards, a plaintiff's lawyer would tend to maximize his own income by choosing to act for clients with ongoing sources of income.[38,39] (Indeed, the costs of costs of bringing a claim may simply exceed the damages recoverable.)

The elderly and the poor are particularly unlikely to generate income. Moreover, what income they do generate is less likely to be "lost" because of a decline in physical capacity occasioned by negligent injury. Within the Medicare population, however, younger beneficiaries generally have a

greater capacity to earn income relative to older beneficiaries, making them somewhat more attractive clients, all else being equal. This probably explains why age ≥75 years has independent explanatory power in our multivariate model. In addition, the size of any award to elderly patients will usually be constrained by their shorter life expectancy, and some in this group can be expected to have trouble recognizing that they have suffered a medical injury, much less substandard care.

An important limitation in our study is reliability of (1) adverse event judgments and (2) judgments about which of those adverse events were due to negligence. Our investigator verification efforts[20] provided a strong safeguard against false positive adverse events, but re-review of medical records that reviewers determined did not involve adverse events could not feasibly be undertaken. With negligent adverse events, we were again able to eliminate false positives quite conclusively by revisiting each event judged to involve negligence to ensure that it met the study definition. There was also some opportunity to eliminate false negatives among negligent adverse events: investigators reviewed the entire pool of adverse events to ensure that none had been overlooked as having been due to negligence. This iterative decision-making approach bears some resemblance to that used to decide the issue of negligence in court, wherein multiple physician testimonies are weighed. Moreover, a 10-year follow-up of the Harvard Medical Practice Study found that, in all but 3 of 46 litigated cases, reviewers' judgments of negligence correlated closely with expert assessments subsequently made by insurers.[40]

There are several other limitations to our study. First, medical record review may have overlooked negligent care not documented in the medical record or that transpired exclusively in the outpatient setting. To the extent that such oversights occurred, our results will underestimate both the ratio of negligence to claims and the probability that a suit follows a negligent adverse event. Second, oversight of claims made by patients in Utah and Colorado would cause biases in the opposite direction. It is possible that a small number of incident-year 1992 claims had not been made at the time we collected our data in 1997, despite 2-year statutes of limitations on malpractice actions in force in both states. More important, we did not have access to information on fully 100% of claims in either state. If patients in our sample had received their care from a physician insured by minor malpractice insurers and had sued, this would affect our estimates in Table 2. However, because of the large portion of the insurance market we were able to capture and the statistical properties of the affected ratios, our findings are fairly robust to potential variation among the unobserved insurers.

Third, in our comparison of nonclaimants with claimants, all of the nonclaimants were known to have suffered negligent injury, whereas the injury status of the claimants was unknown. Previous studies and our own matches suggest that many claimants will have sued in the absence of negligence, even medical injury. However, if we assume that the fact of negligence should increase, not decrease, the probability that any given patient will file a claim (ie, by increasing chances of success and thereby of securing representation), then those claimants who suffered negligence would tend to resemble the profile of nonclaimants, biasing any differences to the null.

Finally, other unobserved factors may confound our findings of distinctive characteristics in the nonclaimant group. For example, a lower level of education, an inability to discern the occurrence of a negligent injury, a shorter life-expectancy, and the absence of third-party advice are all factors potentially related to both the distinctive characteristics of members of the nonclaimant group and their failure to bring suit. Regulatory barriers may also restrict the opportunity for poor patients to secure legal representation; for example, federal law prevents legal services attorneys, often the only attorneys available in poor neighborhoods, from taking on "fee generating" work such as malpractice, except in extenuating circumstances.[41,42] In addition, older, poorer patients may be simply more reluctant to sue than wealthier patients.

It seems likely that a combination of these unobserved factors and the characteristics we identified truly characterizes nonclaimants. In any case, the critique they level at the efficacy of the current malpractice system is the same: Factors other than individual merit appear to play a strong role in determining who uses the malpractice system and who receives compensation from it. These concerns should be understood in the context of our more general findings that claims lag well behind the incidence of negligent injury and that the 2 are seldom connected in the current system.

Some improvements in linking negligent medical care to claims and compensation might be achieved through regulatory "tinkering" with the medical malpractice system.[43] Alternatively, policy makers could concede the limited ability of the system to meet its objectives and pursue more dramatic reform; experimentation with no-fault compensation for medical injury is one long-debated option.[44] Although this type of reform appears to be technically and economically feasible,[45] our experience in Utah and Colorado during the course of this study suggests that it will remain politically infeasible in a climate of steady claims rates and manageable premiums. A third medical malpractice "crisis"[46] in the United States may be necessary before such sweeping reforms will be seriously considered.

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