SPECIAL ARTICLE

Malpractice Risk According to Physician Specialty

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ABSTRACT

BACKGROUND

Data are lacking on the proportion of physicians who face malpractice claims in a year, the size of those claims, and the cumulative career malpractice risk according to specialty.

METHODS

We analyzed malpractice data from 1991 through 2005 for all physicians who were covered by a large professional liability insurer with a nationwide client base (40,916 physicians and 233,738 physician-years of coverage). For 25 specialties, we reported the proportion of physicians who had malpractice claims in a year, the proportion of claims leading to an indemnity payment (compensation paid to a plaintiff), and the size of indemnity payments. We estimated the cumulative risk of ever being sued among physicians in high- and low-risk specialties.

RESULTS

Each year during the study period, 7.4% of all physicians had a malpractice claim, with 1.6% having a claim leading to a payment (i.e., 78% of all claims did not result in payments to claimants). The proportion of physicians facing a claim each year ranged from 19.1% in neurosurgery, 18.9% in thoracic–cardiovascular surgery, and 15.3% in general surgery to 5.2% in family medicine, 3.1% in pediatrics, and 2.6% in psychiatry. The mean indemnity payment was $274,887, and the median was $111,749. Mean payments ranged from $117,832 for dermatology to $520,923 for pediatrics. It was estimated that by the age of 65 years, 75% of physicians in low-risk specialties had faced a malpractice claim, as compared with 99% of physicians in high-risk specialties.

CONCLUSIONS

There is substantial variation in the likelihood of malpractice suits and the size of indemnity payments across specialties. The cumulative risk of facing a malpractice claim is high in all specialties, although most claims do not lead to payments to plaintiffs. (Funded by the RAND Institute for Civil Justice and the National Institute on Aging.)

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Despite tremendous interest in medical malpractice and its reform,[1-10] data are lacking on the proportion of physicians who face malpractice claims according to physician specialty, the size of payments according to specialty, and the cumulative incidence of being sued during the course of a physician's career.[11-13] A recent American Medical Association (AMA) survey of physicians showed that 5% of respondents had faced a malpractice claim during the previous year.[14] Studies estimating specialty-specific malpractice risk from actual claims are much less recent,[15,16] including a Florida study from 1975 through 1980 showing that 15% of medical specialists, 34% of obstetricians and anesthesiologists, and 48% of surgical specialists faced at least one claim that resulted in an associated defense cost or payment to a claimant (an indemnity payment) during the 6-year study period.[17]

Each of these earlier studies has limitations, including the use of older data[15-17] with limited geographic coverage,[17] reliance on self-reports with limited sample size and low response rates,[14] limited information on physician specialty,[13,14] and a lack of information on the size of payments.[14] Although the National Practitioner Data Bank includes most cases in the United States in which a plaintiff was paid on behalf of a licensed health care provider,[18] it does not report the specialties of physicians and does not record information on cases that do not result in a payment.

Using physician-level malpractice claims obtained from a large professional liability insurer, we characterized three aspects of malpractice risk among physicians in 25 specialties: the proportion of physicians facing a malpractice claim in a given year, the proportion of physicians making an indemnity payment, and the size of this payment. In addition, we estimated the cumulative career risk of facing a malpractice claim for physicians in high- and low-risk specialties.

METHODS

MALPRACTICE-CLAIMS DATA

We obtained physician-level data on malpractice claims from a large, physician-owned professional liability insurer that provided coverage to physicians in every U.S. state and the District of Columbia. The procedures for safeguarding these data were approved by the institutional review board at RAND. The data included records on closed malpractice claims for 40,916 physicians who were covered for at least one policy year from 1991 through 2005. The number of physicians grew steadily from 12,498 in 1991 to 17,376 in 2005. We identified 24 specialties that had at least 200 physicians represented in our sample. Physicians belonging to other, smaller specialties were grouped together in an "other specialty" category. Across specialties, there were 233,738 physician-years of coverage, with an average duration of coverage of 5.7 years (range, 4.6 in pediatrics to 7.3 in thoracic–cardiovascular surgery). The most common specialties in our data were anesthesiology, family general practice, and internal medicine (Table 1).

Claims were available for all years during which a physician was covered by the insurer. Claims that were not yet closed by the insurer were not available. Indemnity payments that were associated with a claim reflected payments to a claimant that arose from either a settlement with the claimant or a jury verdict.

Although the data included physicians from all 50 states, California was overrepresented in our data, accounting for 16,076 physicians (39.3%). We corrected for this oversampling by weighting each physician in our data by the relative number of physicians who are not employed by the federal government reported in the Area Resource File of the Department of Health and Human Services. After weighting, the share of physicians in California was 12.2%, which by construction matches the share reported in the Area Resource File. Because we relied on data from a single insurer, we verified that the average number of indemnity claims per physician and payment levels in our data matched similar numbers in the National Practitioner Data Bank. In a previous study, investigators also relied on claims from a single insurer.[19]

We included physicians between the ages of 30 and 70 years in the study. The average age of physicians in all specialties was 49.0 years (range, 43.2 for emergency medicine to 53.0 for gynecology). Data on other demographic characteristics (e.g., sex and race) were not available.

DESCRIBING MALPRACTICE RISK

For each specialty, we began by calculating the proportion of physicians who faced a malpractice claim in a given year. We distinguished between claims leading to indemnity payments versus over-

Table 1. Summary Statistics for Physician Specialties.*

Specialty	Physician-Years of Coverage	No. of Physicians	Physician Age	Coverage Years per Physician
	no.		*yr*	*no.*
All physicians	233,738	40,916	49.0±9.5	7.2±4.4
Anesthesiology	29,952	5,037	45.6±8.5	7.2±3.9
Cardiology	4,155	777	49.8±8.9	5.9±4.4
Dermatology	3,627	532	47.8±9.9	8.0±5.1
Diagnostic radiology	4,905	808	48.6±9.1	6.6±4.3
Emergency medicine	1,631	352	43.2±8.1	4.8±3.3
Family general practice	25,758	4,975	48.9±9.7	6.2±4.2
Gastroenterology	3,981	639	50.2±8.6	7.0±4.7
General surgery	7,352	1,205	48.9±9.4	7.2±4.5
Gynecology	2,577	459	53.0±9.1	5.8±3.9
Internal medicine	27,268	4,905	47.8±9.4	7.2±4.6
Nephrology	1,373	248	47.2±9.1	7.3±5.0
Neurology	3,037	519	48.4±8.4	6.6±4.8
Neurosurgery	1,927	351	48.6±8.2	5.1±3.2
Obstetrics and gynecology	10,385	1,899	47.5±9.0	6.2±3.5
Oncology	1,207	245	49.8±7.9	6.1±3.5
Ophthalmology	5,203	807	50.0±9.9	7.6±4.9
Orthopedic surgery	11,928	2,224	48.3±8.9	6.0±4.4
Pathology	20,717	3,094	51.8±9.6	9.5±4.3
Pediatrics	7,381	1,616	45.8±9.4	5.2±4.1
Plastic surgery	11,882	1,862	47.4±9.0	7.6±4.4
Psychiatry	19,011	3,011	52.5±8.7	6.6±3.5
Pulmonary medicine	2,362	380	47.5±8.2	7.7±5.0
Thoracic–cardiovascular surgery	3,187	437	50.6±9.1	8.7±4.6
Urology	2,328	368	51.9±9.3	7.3±4.9
Other specialty	20,604	4,166	47.3±9.7	5.4±4.0

* Plus–minus values are means ±SD. All calculations were performed with the use of a database of physicians covered by a large, multistate liability insurer. The numbers of physician-years and physician observations are reported for all physicians between the ages of 30 and 70 years during the period from 1991 through 2005.

all claims (those with a defense cost but not necessarily a payment). In sensitivity analysis, we adjusted for physician age, year, and state to examine whether these adjustments would affect our reported estimates.

Given the long period studied, we separated our sample into three periods (1991–1995, 1996–2000, and 2001–2003) in order to investigate how claims rates varied over time for high- and low-risk specialties, which were defined as the five specialties with the highest and lowest proportions of physicians with a claim in a year, respectively. We did not include 2004–2005, since many claims that had been filed during that period might not have been closed by the end of 2005.

We then characterized the size of malpractice payments for each specialty by computing mean and median annual payments. We also determined how many payments exceeded $1 million to characterize specialties with outlier awards. Payments were normalized to 2008 dollars on the basis of the Consumer Price Index.

Finally, we analyzed data on physician age to estimate the cumulative career malpractice risk of

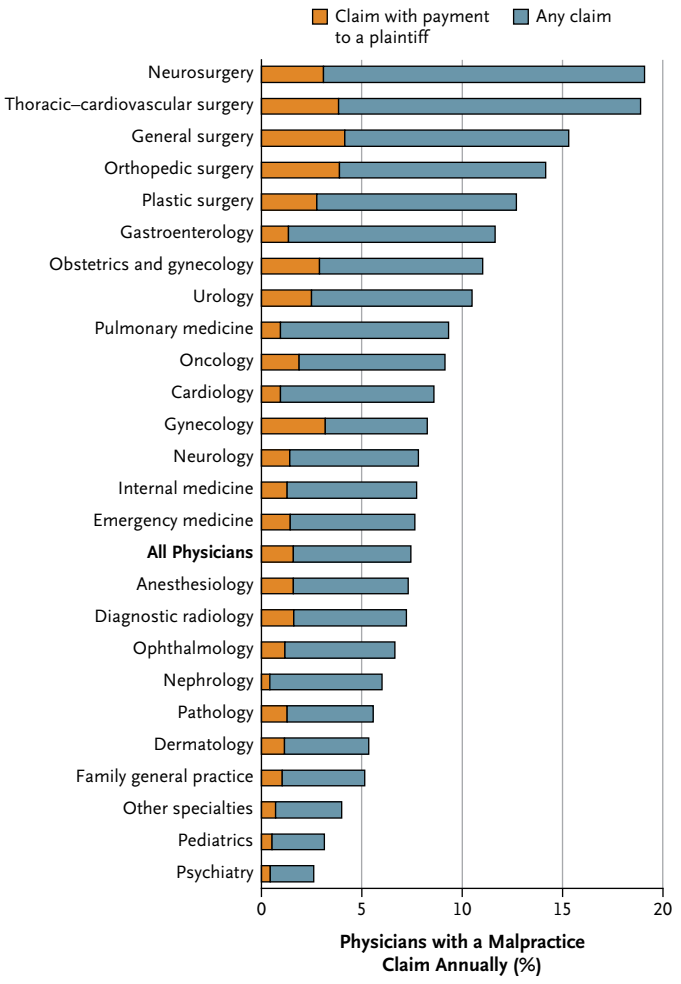

Figure 1. Proportion of Physicians Facing a Malpractice Claim Annually, According to Specialty.

being sued at least once by a given age for both high- and low-risk specialties. We first estimated a multivariate regression model of the probability of facing at least one claim in a given year as a function of physician age, physician random effects, physician specialty, state of practice, and county–year demographic variables (per capita income, age distribution, and the proportions of residents who were white or male). We allowed the effect of age to vary according to specialty. Physician random effects were included to account for unobserved differences among physicians that might have led some physicians to have been sued more frequently than others. This estimation yielded predicted annual rates of facing a claim at every age of a physician's career and for each specialty. These estimated lifetime risk profiles were then used to compute cumulative career malpractice risks for physicians in high- and low-risk specialties, as well as in each of the largest specialties in our data (internal medicine and its subspecialties, general surgery and surgical subspecialties, anesthesiology, obstetrics and gynecology, and pathology).

Our model assumes that the probability of being sued was unrelated to the duration of coverage by the insurer and that the probability of being sued at a given age was independent of being sued at an earlier age (after adjustment for physician random effects). To ensure that estimates of the cumulative risk of being sued in each specialty were not determined by the experience of a few idiosyncratic physicians, we conducted two sensitivity analyses: we excluded physicians after their first claim (consequently ignoring the subsequent experiences of physicians who were sued repeatedly) and estimated fixed-effects specifications that allow for correlation between physician characteristics (such as age) and unobserved propensities to be sued.

RESULTS

MALPRACTICE CLAIMS ACCORDING TO SPECIALTY

Figure 1 shows the proportion of physicians who faced a malpractice claim in a year according to specialty. Across specialties, 7.4% of physicians annually had a claim, whereas 1.6% made an indemnity payment. There was significant variation across specialties in the probability of facing a claim, ranging annually from 19.1% in neurosurgery, 18.9% in thoracic–cardiovascular surgery, and 15.3% in general surgery to 5.2% in family medicine, 3.1% in pediatrics, and 2.6% in psychiatry. Specialties in which physicians were most likely to face claims were not always specialties in which indemnity claims were most prevalent. Our estimates of rates of overall and paid claims were unaffected by adjustment for physician age, year, and state of practice.

Another measure of risk is the likelihood of a payment conditional on a claim. The payment rate can be inferred as the proportion of physicians making a payment divided by the proportion facing a claim. The proportion of physicians with a claim was not well correlated with the payment rate (Pearson's correlation, 0.17; P=0.42). For ex-

ample, gynecology alone had the 12th highest average annual proportion of physicians with a claim, but it had the highest payment rate (>38%).

TRENDS IN CLAIMS

The proportion of physicians facing a malpractice claim varied moderately across the study period (Fig. 2). Between the 1991–1995 and 2001–2003 periods, the average annual proportion of physicians in low-risk specialties with a claim decreased from 8.3% to 5.8%. Among high-risk specialties, the proportion of physicians with a claim was highest during the 1996–2000 period. Claims with an indemnity had similar patterns, and the differences between periods were significant (P<0.001 for all comparisons). Differences in overall and indemnity claims were stable between high-risk and low-risk specialties over time.

SIZE OF MALPRACTICE INDEMNITY PAYMENTS

Figure 3 shows mean and median indemnity payments per physician for each specialty after the exclusion of claims that did not result in an indemnity payment. Across specialties, the mean indemnity payment was $274,887, and the median was $111,749. The difference between the mean and median payment reflects the right-skewed payment distribution. Specialties that were most likely to face indemnity claims were often not those with the highest average payments. For example, the average payment for neurosurgeons ($344,811) was less than the average payment for pathologists ($383,509) or for pediatricians ($520,924), even though neurosurgeons were several times more likely to face a claim in a year. The estimated correlation between the proportion of physicians with a claim and the average payment amount was 0.13 (P=0.52). The correlation between the proportion of physicians with an indemnity payment and the average payment was similar and was not significant. This suggests that factors driving the likelihood of a claim are largely independent of factors that drive the size of a payment.

Outlier awards, which were defined as those exceeding $1 million, were infrequent, in part because the full size of outlier awards would not have been recorded if they had exceeded individual policy limits. Among all physician-years, 66 payments exceeded this amount, accounting for less than 1% of all payments. Obstetrics and gynecology accounted for the most payments (11), followed by pathology (10), anesthesiology (7), and pediatrics (7).

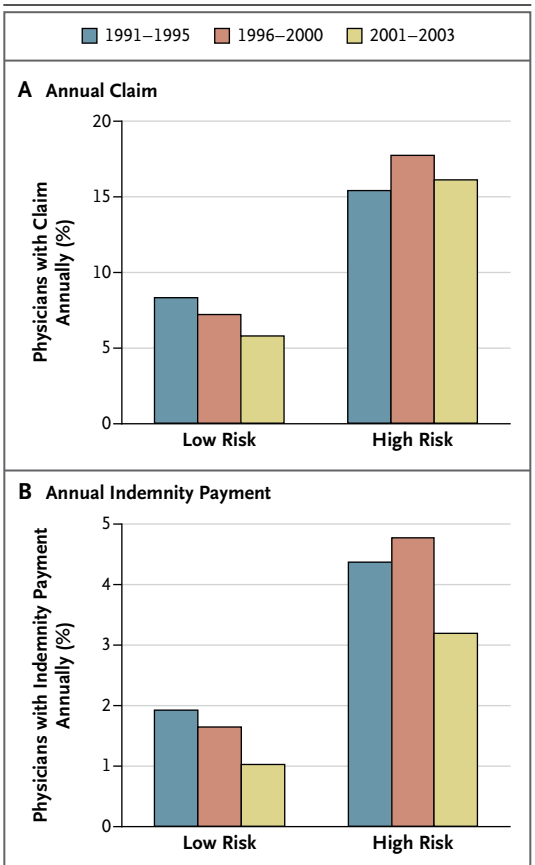

Figure 2. Trends in Overall Claims and Claims with an Indemnity Payment, According to Risk of Specialty.
Panel A shows the proportions of physicians with an annual claim, and Panel B shows the proportion with an indemnity payment (compensation paid to a plaintiff), according to the risk associated with the specialty. High-risk and low-risk specialties were defined as the five specialties with the highest average annual proportion of physicians with a malpractice claim and the five specialties with the lowest average annual proportion, respectively.

CUMULATIVE CAREER MALPRACTICE RISK

The projected proportion of physicians facing a malpractice claim by the age of 65 years was high (Fig. 4). Among physicians in low-risk specialties, 36% were projected to face their first claim by the age of 45 years, as compared with 88% of physicians in high-risk specialties. By the age of 65 years, 75% of physicians in low-risk specialties and 99% of those in high-risk specialties were projected to face a claim. The projected career risk of

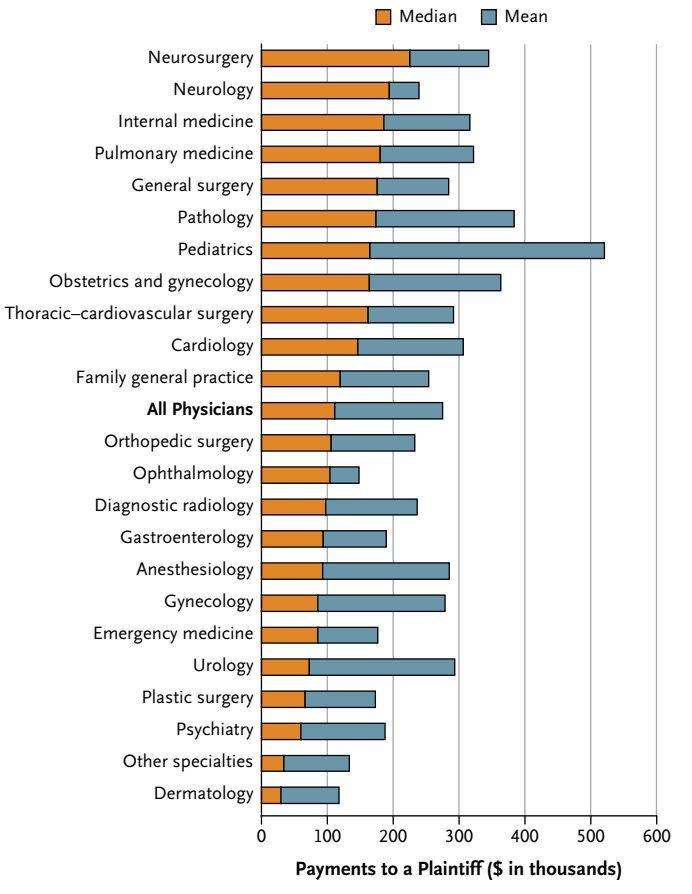

Figure 3. Amount of Malpractice Payments, According to Specialty.
Payments are shown in 2008 dollars. Specialties that had fewer than 30 payments (i.e., oncology and nephrology) are not listed.

making an indemnity payment was also large. Roughly 5% of physicians in low-risk specialties and 33% in high-risk specialties were projected to make their first indemnity payment by the age of 45 years; by the age of 65 years, the risks had increased to 19% and 71%, respectively.

Specialty-specific projections of career malpractice risk were also calculated (Table 1 in the Supplementary Appendix, available with the full text of this article at NEJM.org). Roughly 55% of physicians in internal medicine and its subspecialties were projected to face a malpractice claim by the age of 45 years, and 89% by the age of 65 years. In contrast, 80% of physicians in surgical specialties (including general surgery) and 74% of physicians in obstetrics and gynecology were projected to face a claim by the age of 45 years. The results were unchanged after the exclusion of data for physicians after their first claim or in models that allowed for a correlation between physician characteristics and an unobserved propensity to be sued.

DISCUSSION

There are few recent estimates on the likelihood of malpractice claims and the size of payments according to physician specialty. Using physician-level malpractice claims from a nationwide liability insurer, we found substantial variability across specialties in each of these descriptors of liability risk. Specialties in which the largest proportion of physicians faced a claim were not necessarily those with the highest average payment size. For example, physicians in obstetrics and general surgery — both fields that are regarded as high-risk specialties — were substantially more likely to face a claim than pediatricians and pathologists, yet the average payments among pediatricians and pathologists were considerably greater. The same pattern was noted in a national analysis that was performed more than two decades ago.[15]

For many high-risk specialties, our estimates of annual and career malpractice rates match self-reported claims rates reported in a recent AMA survey of physicians.[14] For several low-risk specialties, however, our findings suggest that the proportion of physicians facing claims is consistently higher than that reported in the AMA survey. This finding suggests underreporting by physicians in low-risk specialties, perhaps because these physicians did not report a claim or because those with previous claims were less likely to respond to the survey. Such a trend could be because the stigma of a claim is worse in specialties in which such claims are less common or because recall bias is more severe for rare events.

Our study uncovered an important aspect of malpractice liability: the high likelihood of claims that do not result in payments to a plaintiff. Annual rates of claims leading to indemnity payments ranged from 1% to 5% across specialties, whereas rates of all claims ranged from 5% to 22%. Our projections suggest that nearly all physicians in high-risk specialties will face at least one claim during their career; however, a substantial minority will not have to make an indemnity payment.

Our results may speak to why physicians consistently report concern over malpractice and the

intense pressure to practice defensive medicine,[20] despite evidence that the scope of defensive medicine is modest.[4,21,22] Concern among physicians over malpractice risk varies far less considerably across states than do objective measures of malpractice risk according to state (e.g., rates of paid claims, average payment sizes, malpractice premiums, and state tort reforms).[1] For example, 65% of physicians practicing in states in the bottom third of rates for paid malpractice claims (5.5 paid claims per 1000 physicians) express substantial concern over malpractice, as compared with 67% of physicians in the top third (14.6 claims per 1000 physicians).[1] Although these annual rates of paid claims are low, the annual and career risks of any malpractice claim are high, suggesting that the risk of being sued alone may create a tangible fear among physicians.

The perceived threat of malpractice among physicians may boil down to three factors: the risk of a claim, the probability of a claim leading to a payment, and the size of payment. Although the frequency and average size of paid claims may not fully explain perceptions among physicians,[1] one may speculate that the large number of claims that do not lead to payment may shape perceived malpractice risk. Physicians can insure against indemnity payments through malpractice insurance, but they cannot insure against the indirect costs of litigation, such as time, stress, added work, and reputational damage.[23] Although there is no evidence on the size of these indirect costs, direct costs are large. For example, a Harvard study of medical malpractice suggested that nearly 40% of claims were not associated with medical errors and that although a low percentage of such claims led to payment of compensation (28%, as compared with 73% of claims with documented medical errors), they accounted for 16% of total liability costs in the system.[19]

Our study has several limitations. As in a previous study,[19] we used data from a single insurer, which may not be nationally representative, even though it is one of the largest in the United States and covers physicians in every state. Whether the claims rates in our study are representative of those nationwide depends on whether physicians who were covered by the insurer that we studied were more or less likely to be sued than physicians who were insured elsewhere. To assess the representativeness of the data, we compared our weighted estimates with the probability and size of indemnity claims reported by the National Practitioner Data Bank. The results are reassuring: the weighted number of indemnity claims per 1000 full-time, nonfederal physicians during the period from 1991 through 2005 was 17.1 in our sample, as compared with 19.6 in the federal database. The weighted average payment in our sample was $274,887 (in 2008 dollars), which is only 4.8% less than the average in the database. These small differences may reflect the fact that the mix of specialties in our sample may not be nationally representative.

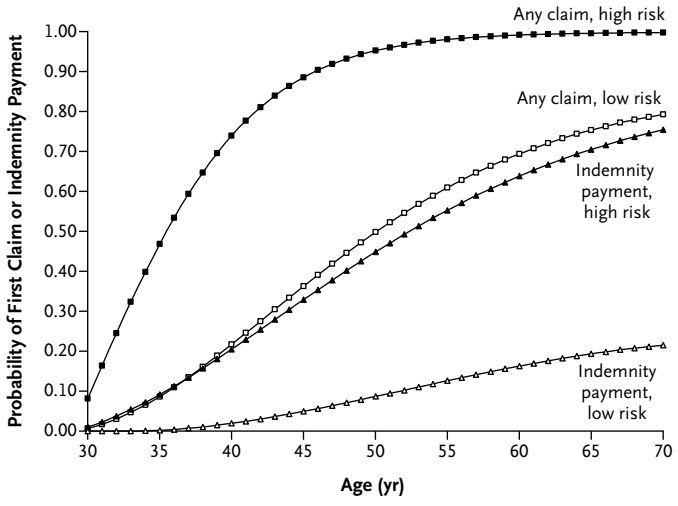

Figure 4. Cumulative Career Probability of Facing a Malpractice Claim or Indemnity Payment, According to Risk of Specialty and Age of Physician.
Cumulative probabilities were estimated from a multivariate linear regression model with adjustment for physician random effects, physician specialty, state of practice, and county demographic characteristics.

Our estimates provide a glimpse into U.S. malpractice risk among physician specialties. High rates of malpractice claims that do not lead to indemnity payments, as well as a high cumulative career malpractice risk in both high- and low-risk specialties, may help to explain perceived malpractice risk among U.S. physicians.

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Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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