

Medical Malpractice Review Panels and Medical Liability System Cost, Timeliness, and Efficiency: A Cross-Sectional Study

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The medical malpractice review panel is a widely adopted tort reform, but few empirical data exist regarding its utility. This cross-sectional study evaluated potential associations between the medical malpractice panel status of a state (mandatory submission panel, optional submission panel, or no panel) and measures of cost, timeliness, and efficiency of medical malpractice claims resolution for the year 2002. Effects of differences in baseline state characteristics that could affect those associations were analyzed using a multiple regression analysis. After adjusting for significant covariates among measures of socioeconomic characteristics, judicial system frequency and function, and other statutory tort reforms, multiple regression analysis found no significant relationship at the state level in the year 2002 between the predictor variable, panel status, and the dependent variables of paid loss ratio, paid defense cost ratio, reported physician malpractice payment, dollars of paid defense cost per dollar of paid loss, reported annual physician malpractice insurance premium for internal medicine, general surgery, and obstetrics/gynecology, time from incident of malpractice to payment of claim, and ratio of paid to unpaid

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claims (p values > 0.05). These observations are consistent with the hypothesis that the medical malpractice review panel is a statutory reform of secondary or neutral effect.

I. INTRODUCTION

Medical malpractice review panels are among the several types of legislative reform that were widely proposed during the medical liability crisis of the 1970s. These panels were designed to promote early identification and resolution of the meritorious liability claim, and early identification and dismissal of the nonmeritorious claim, thereby promoting justice for the parties, increased efficiency of the courts, and stabilization of malpractice premiums for the health system. At various times, at least 31 states adopted malpractice review panels.¹

In the two decades after the initial enactment of state laws authorizing medical malpractice review panels, significant public policy questions arose as to whether the panels were accomplishing their intended legislative goals.² Some authors contended that the panels were ineffective and that they might be increasing liability system costs and unnecessarily

¹Catherine T. Struve, Project on Medical Liability in Pennsylvania, & Pew Charitable Trusts, *Expertise in Medical Malpractice Litigation: Special Courts, Screening Panels, and Other Options* 57–59 (Philadelphia, 2003), available at <http://www.pewtrusts.com/pdf/medical_malpractice_101603.pdf>. In contrast to the 31 states with traditional medical malpractice screening panels noted by Struve, South Dakota created an optional health-care services arbitration panel in 1976. This panel consists of an arbitration officer and may contain physicians, attorneys, or members of the state hospital association. The process applies binding arbitration to a malpractice claim filed with the panel when there is an existing voluntary arbitration agreement between a hospital or physician and a patient. S.D. Codified Laws §§ 21-25B-4–26 (1987 & LexisNexis Supp. 2003). Vermont also enacted a voluntary arbitration panel for malpractice claims in 1975. The panel consists of a judicial referee, a layperson, and a health-care professional. If the panel finds for the plaintiff, the panel also specifies the amount of damages. A judgment order issued by the superior court in accordance with the decision of the panel may be appealed to the supreme court. Vt. Stat. Ann. tit. 12, §§ 7001–7009 (LexisNexis 2002).

²See William J. Curran, *Screening Panels in Malpractice Cases: Some Disturbing Progress Reports*, 302 *New Eng. J. Med.* 954, 954 (1980). The author notes that the U.S. Department of Justice had delayed plans for a federal statute to require states to establish screening panels in part due to what he termed “the growing number of disturbing reports of failures and ineptitude in the state screening panels.”

lengthening the process of claim resolution.³ In 1980, a report to the Chief Administrative Judge of the State of New York found that: “Notwithstanding the fact that certain attorneys and physicians have testified to their satisfaction with the current panel system, this Committee has concluded that the cost in time and money imposed by the panel has exceeded its benefit to the Judiciary, the Bar, the medical profession and to society in general.”⁴ Some authors noted mixed effects of panels, with variation in panel structure felt to be problematic, and suggested refinement in state statutes to improve panel function.⁵ In 1977, the Institute of Judicial

³See Catherine S. Meschivitz, *Efficacious or Precarious? Comments on the Processing and Resolution of Medical Malpractice Claims in the United States*, 3 *Annals Health L.* 123, 136 (1994). The author reviews the results of her study of the Wisconsin mandatory mediation panel system, and states that “the panels were not settling claims, and, in fact, claims were proceeding within the trial court system in higher numbers than before. Prohibition of discovery and the lack of clear medical information at these early stages of the process precludes rapid decisions regarding causation and harm.” See also Dennis J. Razor, *Mandatory Medical Malpractice Screening Panels: A Need to Reevaluate*, 9 *Ohio St. J. on Disp. Resol.* 115, 122 (1993) (maintaining that “the evidence from court records suggests that mandatory screening panels have had little success in resolving disputes faster and cheaper than traditional litigation”). See also Betsy A. Rosen, *The 1985 Medical Malpractice Reform Act: The New York State Legislature Responds to the Medical Malpractice Crisis with a Prescription for Comprehensive Reform*, 52 *Brook. L. Rev.* 135, 162 (1986) (Stating that “the retention of malpractice panels may jeopardize the achievement of the goal of decreasing litigation costs. Malpractice panels are notorious for causing long delays in the litigation process.”).

⁴Joseph F. Gagliardi et al., *Report of the Ad Hoc Committee on Medical Malpractice Panels to the Chief Administrative Judge of the State of New York on the Operation of Medical Malpractice Panels* 165 (Albany, 1980).

⁵See Jean A. Macchiaroli, *Medical Malpractice Screening Panels: Proposed Model Legislation to Cure Judicial Ills*, 58 *Geo. Wash. L. Rev.* 181, 186 (1990). The author states that medical malpractice screening panels “have the potential to serve an essential antidotal function to the ailments of the judicial system and should be enacted in every state.” The author proposes a model statute for legislation enacting medical malpractice panels. See also Richard Boyle, *Medical Malpractice Screening Panels: A Judicial Evaluation of Their Practical Effect*, 42 *U. Pitt. L. Rev.* 939, 940, 958–59 (stating that “it is the contention of this Note that medical malpractice screening panels are theoretically sound, and have the potential to be a viable solution to the medical malpractice crisis,” but then finding that data from Pennsylvania, Florida, and Maryland supported the conclusion that “at least in the three states from which data is available, screening panels are inimical to legislative objectives”). See also Peter E. Carlin, *Intergovernmental Health Policy Project*, *Geo. Wash. Univ., Medical Malpractice Pre-Trial Screening Panels: A Review of the Evidence* 41 (Washington, DC, 1980), stating that “if those states with ineffective panel systems begin to adopt modifications that will improve their performance, screening panels may one day be truly hailed as a major ‘reform’ mechanism.”

Administration studied panel systems in four states, at the request of the American Bar Association Commission on Medical Professional Liability, and concluded that “not even an informed guess can be ventured about the effect of panel hearings on insurance premiums.”⁶ Other authors reported a reduced frequency of claims attributable to the effect of panels,⁷ and vigorously defended panels as effective in promoting equitable resolution of malpractice claims.⁸

Medical malpractice review panels also drew early federal attention. In 1973, the U.S. Department of Health, Education, and Welfare reported on early experience with medical malpractice panels, concluding that “they merit continued experimentation.”⁹ In 1975, legislation was introduced in the U.S. House of Representatives proposing a federal requirement that any civil action for medical malpractice must first undergo arbitration prior to a filing in state court. This bill also proposed a federal authorization for the states to establish panels for arbitration of medical malpractice claims and sought to establish national standards for these panel proceedings.¹⁰ In 1979,

⁶Cynthia Owen Philip & Richard Faust, *Institute of Judicial Administration, Medical Malpractice Panels in Four States* 39 (New York, 1977). This study examined panels in New York, New Mexico, New Jersey, and Pennsylvania. The study reached the primary conclusion that “panels must be mandatory for all medical malpractice actions if they are to be effective in producing dispositions.” The study also concluded that panels should include both health-care providers and attorneys, that panels should decide regarding both liability and damages, and that legislation should provide that panel findings should “have more force than a recommendation.” *Id.* at 39–42.

⁷David Burda, *Pretrial Screening Panels: Useful? 35 Hospitals* (Sept. 5, 1986) (reporting early Indiana data); Neil D. Schor, Note, *Health Care Providers and Alternative Dispute Resolution: Needed Medicine to Combat Medical Malpractice Claims*, 4 *Ohio St. J. Disp. Resol.* 65, 74 (1988) (summarizing studies evaluating malpractice panels and concluding that “screening panels appear to reduce the number of malpractice claims which ultimately proceed to litigation”).

⁸John T. Flynn, *Medical Malpractice Panel: How Has it Worked?* 81 *N.Y. State J. of Med.* 1112, 1112–15 (1981); Michael S. Insler, *Louisiana’s Medical Review Panel*, 34 *Surv. Ophthalmology* 204, 207–08 (1989).

⁹U.S. Department of Health, Education, and Welfare, *Report of the Secretary’s Commission on Medical Malpractice* 91 (Washington, DC, 1973).

¹⁰*Medical Malpractice Insurance and Arbitration Act of 1975*, H.R. 3122, 94th Cong. (1975).

the U.S. Department of Justice studied the possibility of setting minimum federal standards for malpractice panels.¹¹ In a 1987 report, the U.S. Department of Health and Human Services recommended that the states “should consider instituting pretrial screening panels in medical malpractice disputes.”¹² Although several federal bills relating to optional or mandatory use of malpractice review panels by the states were filed between 1980 and 1990, none were reported from committee.¹³

Since their adoption, state panel statutes have been subject to extensive legislative and judicial review. By year-end 2001, nine states had repealed their panel statutes and five had invalidated the panel judicially, with Florida and Illinois taking both types of action at various times.¹⁴ In states that have retained medical malpractice review panels, the panels are generally composed of health-care providers acting under the guidance of an attorney or judge, and are tasked with review of the case in question regarding issues of fault and causation. A small number of panels also suggest a recommended award.¹⁵ The submission of claims to the panel may be mandatory or optional, and other statutory structural provisions remain widely variable.

II. OVERVIEW

Previous analyses have found isolation of the effects of medical malpractice review panels to be difficult due to multiple health system and legal system

¹¹James D. Snyder & James B. Crawford, *Malpractice Screening Panels: Are They Worth the Cost?* *Physician's Management* 61, 62, 64 (April 1979) (reporting an interview with Daniel Meador, Director of the Office for the Improvement of Administrative Justice of the U.S. Department of Justice, and Paul Nejeleski, Assistant Director, and reporting that “the Department plans to set up a mandatory pre-trial review system modeled on professional screening panels which already exist in 28 states”).

¹²U.S. Department of Health and Human Services, *Report of the Task Force on Medical Liability and Medical Malpractice* 34 (Washington, DC, 1987).

¹³E.g., H.R. 15004, 93d Cong. (1974); S. 3161, 96th Cong. (1981); H.R. 2659, 99th Cong. (1985); H.R. 1372, 100th Cong. (1987); H.R. 2858, 101st Cong. (1989); H.R. 4566, 101st Cong. (1990).

¹⁴Struve, *supra* note 1, at 57.

¹⁵Panels in Maryland, New Hampshire, Hawaii, Idaho, Michigan, and Montana had statutory authority to recommend awards in 2002.

covariates.¹⁶ Few empirical data exist regarding the effects of these panels.¹⁷ As another crisis in medical liability has developed in recent years, several states have considered adoption of medical malpractice review panels or conversion of existing optional submission panel structures to a mandatory submission structure, either by legislative introduction or by report of advisory bodies.¹⁸

¹⁶Office of the Legislative Auditor General, Utah State Legislature, A Performance Audit of Medical Malpractice Prelitigation Panels (Digest, i) (Salt Lake City, 1993) [hereinafter Off. Leg. Aud. Gen.], available at <http://www.le.state.ut.us/audit/93_07rpt.pdf>. After analyzing the outcome of 1,214 cases filed with the Utah prelitigation panel between July 1985 and June 1990, the study concludes that “there is no objective way to determine whether the prelitigation process has been a success. While prelitigation hearings appear to encourage the early resolution of some disputes, it is impossible to separate the impact of prelitigation hearings from the impact of other tort reforms, changes in civil procedures, and improved risk management programs.” See also Peter E. Carlin, Confusion, Controversies Stem from Pre-Trial Screening Panels, 102 *Modern Healthcare* (Oct. 1981).

¹⁷Patricia M. Danzon, *Medical Malpractice: Theory, Evidence, and Public Policy 198–202* (Harvard University Press, 1985) [hereinafter Danzon]. The author reports that “data are not available for a detailed empirical evaluation of panels.” See also Office of Technology Assessment, U.S. Congress, *Impact of Legal Reforms on Medical Malpractice Costs 65, 68* (Washington, DC, 1993) [hereinafter O.T.A., *Impact of Legal Reforms*]. The study reviews six empirical studies of state-level malpractice reforms and finds that “only one study examined whether pretrial screening panels (of any type) reduced malpractice insurance premiums . . .” See also Jona Goldschmidt, *Where Have All the Panels Gone? A History of the Arizona Medical Liability Review Panel*, 23 *Ariz. St. L.J.* 1013, 1058 (1991). The author cites a lack of data as a methodological problem in previous research on malpractice screening panels and explores the weaknesses of these studies. See also Struve, *supra* note 1, at 58 (providing an extensive review of research on medical malpractice panels and noting that “of the available multistate studies that looked at panel performance, one analyzes data from 1992, four others cover the mid-1980s and earlier, and the rest use data from the 1970s”).

¹⁸See generally Law and Criminal Justice Committee, National Conference of State Legislatures, *Medical Malpractice Tort Reform, 2005 Introduced Legislation* (Washington, DC, updated Dec. 2005), available at <<http://www.ncsl.org/standcomm/sclaw/medmalreform05.htm>> and Law and Criminal Justice Committee, National Conference of State Legislatures, *Medical Malpractice Tort Reform, 2006 State Introduced Legislation* (Washington, DC, updated May 1, 2006), available at <<http://www.ncsl.org/standcomm/sclaw/medmalreform06.pdf>> (listing among 2005 and 2006 legislative introductions those proposing to materially alter or establish malpractice panels in Connecticut, Iowa, Kansas, Kentucky, Mississippi, Nevada, New Hampshire, New Jersey, Pennsylvania, South Carolina, Tennessee, Vermont, and Wyoming). See also Vermont Medical Malpractice Study Committee, Department of Banking, Insurance, Securities, and Health Care Administration, Division of Insurance, State of Vermont, *Medical Malpractice Liability Insurance in Vermont: A Report to the General Assembly* (Montpelier, Dec. 15, 2005), available at <http://www.bishca.state.vt.us?InsurDiv/medmal_studygroup/MedMal_final-report_Nov17-2005.pdf>. The committee voted to endorse the position that the legislature should establish pretrial screening panels.

Some state advisory bodies have recommended against a current enactment of medical review panel statutes.¹⁹ The policy debates surrounding a renewed interest in malpractice review panels have raised, again, questions regarding the cost, timeliness, and efficiency of these entities.²⁰ Understanding that the true effects of one statutory tort reform are difficult to isolate, we sought instead to analyze the potential associations of statutory medical malpractice review panels at the state level with measures of medical liability system performance in a cross-sectional study of a single calendar year.

III. METHODS

A. *Study Design*

This cross-sectional study evaluated the potential association between the medical malpractice panel status of a state (no panel, optional submission

¹⁹See Advisory Committee on Medical Professional Liability, Joint State Government Commission, General Assembly of the State of Pennsylvania, *Medical Professional Liability Reform for the 21st Century: A Review of Policy Options* 88, 91 (Harrisburg, Mar. 2005), available at <<http://jsg.legis.state.pa.us/Med%20Mal.pdf>>. This report reviews recent legislative attempts to reestablish malpractice review panels in Pennsylvania, and states that “the consensus of the advisory committee to this study is that the General Assembly should not put a high priority on consideration of the reinstitution of screening panels at this time.” See also Ohio Medical Malpractice Commission, Ohio Department of Insurance, *Final Report and Recommendations of the Ohio Medical Malpractice Commission* 13 (Columbus, Apr. 2005), available at <<http://www.ohioinsurance.gov/documents/04-27-05FinalReport.pdf>>. The report states that, regarding binding arbitration, pretrial screening panels, and medical review boards, “Commission research indicates many issues still need to be resolved regarding these proposals . . .”

²⁰Compare Catherine T. Struve, *Improving the Medical Malpractice Litigation Process*, 23 *Health Affairs* 33 (2004) (including a discussion of arguments regarding the effectiveness of panels and detailing the author’s position that panels should not be utilized), and David M. Studdert et al., *Medical Malpractice*, 350 *New Eng. J. Med.* 283, 288 (2004) (reviewing the current medical malpractice crisis and proposed solutions, and stating that panels “generally do not have significant effects”), with Mac Gibson & Josh Belinfante, *Georgia Public Policy Foundation, The Need for Mandatory Medical Review Panels: The Medical Malpractice Crisis in Georgia* (Atlanta, Nov. 14, 2003), available at <http://www.gppf.org/article.asp?RT=9&p=pub/HealthCare/Malpractice/malpractice_full_study.htm> (recommending that the Georgia General Assembly enact a mandatory medical malpractice review panel and providing a legal and policy analysis in support of enactment) and Off. Leg. Aud. Gen., *supra* note 13 (noting that 82 percent of plaintiff attorneys surveyed preferred to eliminate malpractice review panels, but making no recommendation to do so, and recommending that the legislature should be advised on circumstances in which the prelitigation hearings should be waived).

panel, or mandatory submission panel) and measures of cost, timeliness, and efficiency of medical malpractice claim resolution for the year 2002. The states (including the District of Columbia) were analyzed as to baseline characteristics that could affect those associations. These characteristics included socioeconomic variables previously identified as correlated to differences in malpractice system costs, measures of judicial system frequency and function, and the presence of other statutory tort reforms. Variables within these categories were considered as covariates in a multiple regression model.

State laws governing medical malpractice were reviewed as to presence of a malpractice review panel and as to panel construction and function. A state was considered to have a panel in place if its statutes had established a panel prior to 2002. States were identified as those with no medical malpractice review panel, those allowing optional submission of a malpractice claim to the panel, and those requiring mandatory submission of a claim to the panel. A state was defined as mandatory in panel submission if the statute required all claims above a *de minimis* amount to be submitted to the panel and if neither party could unilaterally prevent formation of the panel.

The states were analyzed for baseline differences in demographic and economic variables that have previously been identified as correlated to propensity to file a liability lawsuit or a malpractice claim.²¹ Additionally, the states were analyzed regarding differences in measures of judicial frequency and function, and regarding differences in enacted statutory tort reforms, including those that have previously been identified as effective at reducing

²¹See generally Danzon, *supra* note 14, at 58–83 (providing an empirical analysis of factors related to frequency and severity of malpractice claims); Edmund G. Doherty & Carl O. Haven, Medical Malpractice and Negligence: Sociodemographic Characteristics of Claimants and Non-claimants, 238 JAMA 1656 (1977); LaRae I. Huycke & Mark M. Huycke, Characteristics of Potential Plaintiffs in Malpractice Litigation, 120 Annals Internal Med. 792 (1994); Fred Dunbar & Faten Sabry, NERA Economic Consulting, The Propensity to Sue: Why Do People Seek Legal Actions? (New York, May 2004), available at <http://www.nera.com/image/2004_Sept_Propensity_to_Sue_Dunbar_Sabry.pdf>; David M. Studdert et al., Negligent Care and Malpractice Claiming Behavior in Utah and Colorado, 38 Med. Care 250 (2000); Mark Sager et al., Do the Elderly Sue Physicians? 150 Archives Internal Med. 1091 (1990); Helen R. Burstin et al., Do the Poor Sue More? A Case-Control Study of Malpractice Claims and Sociodemographic Status, 270 JAMA 1697 (1993); Mary G. Mussman et al., Medical Malpractice Claims Filed by Medicaid and Non-Medicaid Recipients in Maryland, 265 JAMA 2992 (1991); Office of Technology Assessment, U.S. Congress, Do Medicaid and Medicare Patients Sue More Often Than Other Patients? (Washington, DC, 1992).

medical liability system costs.²² The baseline socioeconomic variables included age, rural residence, educational attainment, income level, and per-capita use of Medicare and Medicaid health-care resources. The measures of judicial system frequency and function included civil filings per 100,000 population, filings for appeal per 100,000 population, and cases disposed as a percentage of cases filed in courts of general jurisdiction. The statutory tort reforms included a cap on noneconomic damages, collateral source reform, and a shorter statute of limitations. States with total damages caps were treated as having a noneconomic damages cap, and the caps were analyzed as a stratified variable as to the dollar value of the cap. Additionally, the effect of an operational patients compensation fund or other excess layer fund was analyzed, as these entities have the ability to discount their premiums in the presence of substantial unfunded liabilities and thus impact medical professional liability premiums in a manner that differs from that of the commercial markets.²³ Finally, the presence of a requirement for an affidavit of merit by an expert health-care provider was also analyzed, as this has been used instead of a panel review mechanism in some jurisdictions. Those states requiring only an attorney certificate of consultation with an expert were not included among those requiring an affidavit of merit.

To analyze cost and efficiency of malpractice claim resolution among the states, state-specific data sets were constructed for the 2002 experience for the annual aggregate malpractice premium, the paid loss expense, the paid defense cost expense (variably known as allocated loss adjustment expense (ALAE) or direct defense and cost containment expense (DCC)),

²²See generally Danzon, *supra* note 14, at 58–83 (finding that “dollar caps and mandatory offset of compensation from collateral sources significantly reduced claims severity”); O.T.A., *Impact of Legal Reforms*, *supra* note 14 (Finding that “the one reform consistently shown to reduce malpractice cost indicators is caps on damages. Requiring collateral source payments to be deducted from the plaintiff’s malpractice award has also been shown to reduce certain malpractice cost indicators. Pretrial screening panels and limiting the statute of limitations show conflicting results.”); Kenneth E. Thorpe, *The Medical Malpractice “Crisis”: Recent Trends and the Impact of State Reforms*, *Health Affairs* (Millwood) (Supp. 2004, web exclusives) W4-20, available at <<http://content.healthaffairs.org/cgi/reprint/hlthaff.w4.20v1.pdf>> (finding that “premiums in states with a cap on awards were 17.1 percent lower than in states without such caps” and that “loss ratios were 13.3 percent lower in states with discretionary collateral offsets”).

²³See Frank A. Sloan, *The Project on Medical Liability in Pennsylvania*, The Pew Charitable Trusts, *Public Medical Malpractice Insurance* (Philadelphia, 2003), available at <http://www.pewtrusts.com/pdf/medical_malpractice_sloan_030904.pdf>, for an extensive discussion of these differences.

the mean reported physician malpractice payment, the mean time from incident of malpractice to payment of the claim, the number of paid direct loss claims and unpaid direct loss claims, and the annual reported medical liability premium for three physician specialties. State-specific paid loss ratios and defense cost ratios were developed by dividing the respective value by the aggregate annual premium. A state-specific ratio of dollars of paid defense cost per dollar of paid loss was developed by dividing the total ALAE by the total paid loss for each state. Efficiency of the claim resolution process was analyzed by evaluating state-specific data for the mean time from incident of malpractice to time of payment of the claim for 2002 in a large physician database and by analyzing the ratio of paid to unpaid claims from 2001 and 2002 in a large hospital experience. With panel status as the predictor variable—no panel, optional submission panel, or mandatory submission panel—differences between the states were then analyzed across these principal cost, timeliness, and efficiency measures, with adjustment for effects of covariables.

B. Analysis of State Laws

State laws governing medical liability were reviewed by analyzing summary tables published by the American Medical Association²⁴ and the National Conference of State Legislatures,²⁵ by review of the individual state law descriptions in the *Summary of Medical Malpractice Law* from the firm of McCullough, Campbell, and Lane,²⁶ and by review of individual state statutes. States in which only a more generalized arbitration or mediation mechanism exists were not included among those having a medical malpractice review panel. The South Dakota and Vermont statutes are structured as optional submission arbitration measures, but also utilize a specialized

²⁴Advocacy Resource Center, American Medical Association, State Laws Chart I: Liability Reforms (Aug. 25, 2003); Advocacy Resource Center, American Medical Association, Select State Laws II: Liability Reform (Chicago, Aug. 25, 2003) [hereinafter Adv. Res. Ctr., AMA, State Laws II].

²⁵National Conference of State Legislatures, State Medical Liability Laws Table (Washington, DC, Oct. 16, 2002) [hereinafter NCSL], available at <<http://www.ncsl.org/programs/insur/medliability.pdf>>.

²⁶McCullough, Campbell, & Lane, *Summary of United States Medical Malpractice Law* (Chicago, 1998), available at <<http://www.mcandl.com/introduction.html>>.

medical malpractice review panel that includes health-care providers. As these panels provide a dispositive mechanism rather than a screening mechanism, we included Vermont and South Dakota among those states with no medical malpractice screening panel. For those states identified as having a medical malpractice review panel, the governing statutes of each state were then collected and reviewed in detail. These laws were analyzed as codified in 2002 as to panel construction and function. State laws were also analyzed regarding the presence of a cap on noneconomic damages and the amount of such a cap, a discretionary or mandatory collateral source offset, the length of the statute of limitations, the presence of an operational patients compensation fund or excess layer fund, and a requirement for an affidavit of merit from an expert health-care provider as a condition of filing an action.

C. Sources of Data

As the average time from incident of malpractice to payment was 4.5 years in 2002,²⁷ we chose to analyze data for the socioeconomic and judicial function variables from available sources reporting in the time period 1998 through 2002. Data for educational attainment measures by state were obtained for 2002 from the U.S. Census Bureau as high school completion rates and rates of achievement of a bachelor's degree or more for adults 25 years or greater in age, and are integer data.²⁸ Data for rural population as a percentage of state total for 2000 were obtained from the Northeast-Midwest Institute calculations based on 2000 Census data.²⁹ Data for population distribution by age for 2002–2003, Medicaid spending per enrollee for fiscal year 2000, and

²⁷Division of Practitioner Data Banks, Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Services, National Practitioner Data Bank: 2002 Annual Report (Table 9) (Rockville, MD, 2002) [hereinafter NPDB Ann. Rep. 2002], available at <http://www.npdb-hipdb.com/pubs/stats/2002_NPDB_Annual_Report.pdf>.

²⁸Economics and Statistics Administration, U.S. Census Bureau, Educational Attainment in the United States: March 2002 (Table 13) (Washington, DC, Mar. 21, 2003), available at <<http://www.census.gov/population/socdemo/education/ppl-169/tab13.pdf>>.

²⁹Northeast-Midwest Institute, Rural Population as a Percent of State Total by State, 2000 (Washington, DC, Oct. 24, 2002), available at <<http://www.nemw.org/poprural.htm>>.

Medicare spending per beneficiary for 1998 were obtained from the Kaiser Family Foundation statehealthfacts.org.³⁰ Data for household income taken as the median money income for 2001–2002, data for the percentage of people in poverty taken as the 2001–2002 two-year average, and data for the percentage of people without health insurance coverage taken as the 2001–2002 two-year average were obtained from the U.S. Census Bureau.³¹ Data for civil filings per 100,000 population for 2000, for appeals per 100,000 population for 2001, and for cases disposed as a percentage of cases filed in courts of general jurisdiction for 2000 and 2001 were obtained from the National Center for State Courts (NCSC).³² The data for cases disposed as a percentage of cases filed were taken as a two-year average for 2000 and 2001. The NCSC data sets for appeals filed per 100,000 population and for cases disposed as a percentage of cases filed were not inclusive of data for two and 10 states, respectively, and states for which no data were available were omitted from analysis for these measures.

Data for 2002 for direct written premium by state, for direct losses paid by state, and defense cost containment expense paid by state were obtained from a custom project report performed by the A.M. Best Company (Oldwick, NJ, unpublished data, November 22, 2004) and include data sets representing the total U.S. property/casualty industry by state for the medical malpractice line. Although not publicly available, the A.M. Best data were highly correlated to publicly available data from the National

³⁰Statehealthfacts.org, Kaiser Family Foundation, Population Distribution by Age, State Data 2002–2003, U.S. 2003 (Washington, DC, 2004) (data presently archived, available on request); Statehealthfacts.org, Kaiser Family Foundation, Medicaid Spending per Enrollee, Fiscal Year 2000 (2004) (data presently archived, available on request); Statehealthfacts.org, Kaiser Family Foundation, Medicare Spending per Beneficiary, 1998 (Washington, DC, 2004) (data presently archived, available on request).

³¹Carmen DeNavas-Walt et al., U.S. Census Bureau, Income, Poverty, and Health Insurance Coverage in the United States, 2003 (Table 7, at 29; Table 8, at 23) (Washington, DC, Aug. 2004), available at <<http://www.census.gov/prod/2004pubs/p60-226.pdf>>.

³²Brian J. Ostrom, Neal B. Kauder & Robert C. LaFountain, eds., *Examining the Work of State Courts, 2001: A National Perspective from the Court Statistics Project* (Williamsburg, VA, 2001); Brian J. Ostrom, Neal B. Kauder & Robert C. LaFountain, eds., *Examining the Work of State Courts, 2002: A National Perspective from the Court Statistics Project* (Williamsburg, VA, 2003); Court Statistics Project, National Center for State Courts, *State Court Caseload Statistics, 2002* (Williamsburg, VA, 2003).

Association of Insurance Commissioners,³³ which reported total direct written premium, direct losses paid, and defense and cost containment expenses incurred for insurers with market share greater than 2 percent by state for 2002 ($r > 0.94$, $p < 0.0001$ for all three correlated data sets). For those states with a patients compensation fund or other excess layer fund, direct written premium, paid loss expense, and paid defense expense data for fiscal year 2002 were obtained from individual state sources and added to the A.M. Best data to generate a more complete picture of the total experience in those states. Data for reported physician malpractice payments were generated as the two-year average of state-specific means for 2001–2002 as reported in the annual reports of the National Practitioner Data Bank for those years, adjusted for reporting of patients compensation fund and excess fund supplemental payments.³⁴ Data regarding the time from incident of malpractice to payment of the claim were taken as the mean values reported in the 2002 annual report of the National Practitioner Data Bank.³⁵ Data for hospital direct loss claims paid and unpaid for 2001 and 2002 were derived from an analysis of the Supplements “A” to Schedule T for aggregate property/casualty annual statement data, obtained from a custom project report performed by the A.M. Best Company (Oldwick, NJ, unpublished data, November 22, 2004). Data for annual reported physician medical liability premiums were generated by analysis of data from the Medical Liability Monitor *Annual Rate Survey* for 2002.³⁶ Premium values were for internal medicine, general surgery, and obstetrics/gynecology, and were a nonmarket-weighted average of the premium data reported for each state. Premium values included any applicable patients compensation fund or excess layer fund surcharge. In states with multiple geographic regional

³³Eric Nordman & Davin Cermak, National Association of Insurance Commissioners, *Medical Malpractice Insurance Report: A Study of Market Conditions and Potential Solutions to the Recent Crisis* (Kansas City, MO, 2004).

³⁴Division of Practitioner Data Banks, Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Services, *National Practitioner Data Bank: Annual Report, 2001* (Table 9) (Rockville, MD, 2001), available at <http://www.npdb-hipdb.hrsa.gov/pubs/stats/2001_NPDB_Annual_Report.pdf>; NPDB Ann. Rep. 2002, *supra* note 24.

³⁵NPDB Ann. Rep. 2002, *supra* note 24.

³⁶Medical Liability Monitor, *2002 Rate Survey of Three Medical Specialties* (Chicago, Oct. 2002).

premium markets, the highest regional market premium was utilized. All dollar amounts were expressed in 2002 dollars unless otherwise noted.

D. Statistical Analysis

1. Between-Groups Analysis

Descriptive statistics were calculated for all variables of interest. Continuous variables were summarized using means and standard deviations (*SD*), whereas categorical variables were summarized using counts and percentages. Continuous and interval baseline independent variables and the dependent cost/timeliness/efficiency variables were assessed for normality using the Kolmogorov-Smirnov test and for heterogeneity of variance with the *F*-max test. Nonparametric data sets were tested for group differences with the Kruskal-Wallis test, with the Dwass-Steel-Critchlow-Fligner procedure used to further characterize any identified between-groups differences. Parametric data sets were analyzed for group differences with one-way analysis of variance (ANOVA), with between-groups testing performed with the Tukey-Kramer method for multiple comparisons. Categorical variables were analyzed with the chi-square test or the Fisher exact probability test. Descriptive statistics and between-groups analyses were carried out using StatsDirect Version 2.5.6 (StatsDirect, Ltd., Cheshire, UK).

2. Multiple Regression Analysis

Multiple regression analyses were carried out to assess the relationship of the predictor variable (panel status) and various covariates (socioeconomic characteristics, judicial system frequency and function, and statutory tort reforms) to the dependent variables (cost, timeliness, and efficiency of medical malpractice claim resolution). The predictor variable and covariates were assessed for the presence of multicollinearity prior to analysis. A statistically significant correlation coefficient greater than or equal to 0.8 was considered to indicate the presence of multicollinearity and in such cases only one member of a correlated set would be retained for the multivariable analysis. Multicollinearity was not found to be a concern among the independent variables in the model.

Two variables (percentage of population completing high school and total patients compensation fund premium) were dropped prior to analysis as these variables did not have a great deal of variability and would be

problematic in a larger analysis. The percentage of the population attaining a bachelor's degree was felt to adequately represent the effect of educational attainment.

The number of variables was further reduced using regression modeling techniques.³⁷ The reduction technique involved looking initially at a model with only the predictor variable of interest (panel status) and a single dependent variable. The parameter estimate signifying the relationship between panel status and the single dependent variable was noted, and then one of the covariates was added to this model. Whether this new covariate changed the parameter estimate for the key variable panel status by more than 10 percent was noted. If so, this variable was retained for the final multivariable model. If the parameter estimate did not change appreciably (<10 percent), this variable was not included in the final model. Subsequent covariates were then similarly entered into the model with panel status in order to determine whether the covariate should be retained in the final model. This procedure was repeated for each individual covariate until a final group of covariates remains for use in the final model. All multiple regression analyses were carried out using SAS Version 9.1.³⁸ Significance was determined by a probability value (*p* value) less than or equal to 0.05.

IV. RESULTS AND CONCLUSIONS

For 2002, 31 states were found to have no malpractice review panel, seven states were identified as having an optional submission medical malpractice review panel (Table 1), and 13 states were identified as having a mandatory submission panel (Table 2). No state had changed its panel status during the period from year-end 1999 to year-end 2001.³⁹ When grouped by panel status and analyzed as to baseline variables previously identified as correlated to frequency of lawsuit or malpractice claims, or to overall malpractice system costs (Table 3), no significant difference between these state groups was noted for population distribution by age, for the proportion of the popula-

³⁷F. Harrell, *Regression Modeling Strategies* (Springer Verlag, 2001).

³⁸SAS Institute, Cary, NC, USA.

³⁹Adv. Res. Ctr., AMA, *State Laws II*, supra note 21; NCSL, supra note 22.

Table 1: Statutory Provisions of Medical Malpractice Review Panels in Optional Submission States, 2002

State	Citation	Number of Members (Physician/Health-Care Provider, Attorney, Other)	Statutory Panel Filing Fee (Amount)	Suspends Filing of Suit	Powers of Discovery	Discovery by Parties Allowed	Written Report Issued	Findings Admissible	Payment of Panel Costs
Connecticut ^a	Conn. Gen. Stat. Ann. §§ 38a-32-38a-36 (Thompson/West 2002), (repealed 2005, sec P.A. 05-275, § 28)	3 (2, 1, 0)	No	No	Not specified	Not specified	Yes	Yes ^b	Not applicable ^c
Delaware	Del. Code Ann. tit. 18, §§ 6801-6814 (1999)	6 (2, 1, 3) ^d	No	No	Yes	Yes	Yes	Yes	Modified loser pays ^c
Kansas	Kan. Stat. Ann. §§ 60-3501-60-3509 (2005), §§ 65-4901-65-4908 (2002)	4 (3, 1, 0) ^f	No	No ^g	Not specified	Not specified	Yes	Yes	Winner pays
Maryland ^h	Md. Code, Cts. & Jud. §§ 3-2A-01-3-2A-09, 3-214-3-221 (LexisNexis 2002 & Supp. 2005)	3 (1, 1, 1)	Yes (\$40)	No	Yes	Yes	Yes ⁱ	Yes	Modified loser pays ^c
Nebraska	Neb. Rev. Stat. §§ 44-2840-44-2847 (2004)	4 (3, 1, 0) ^{hj}	No	Yes	Yes	Yes	Yes	Yes	Equal split
New Hampshire ^k	N.H. Rev. Stat. Ann. §§ 519-A:1-519-A:10 (2003)	3 (1, 1, 1) ^l	No	Yes	Yes	Yes	Yes ^m	Modified ⁿ	Not applicable ^c

Table 2: Statutory Provisions of Medical Malpractice Review Panels in Mandatory Submission States, 2002

State	Citation	Number of Members (Physician/Health-Care Provider, Attorney, Other)	Statutory Panel Filing Fee (Amount)	Suspends Filing of Stat.	Powers of Discovery	Discovery by Parties Allowed	Written Report Issued	Findings Admissible	Payment of Panel Costs
Alaska	Alaska Stat. § 09.55.536 (2004)	3 (3, 0, 0) ^a	No	No	Yes	No	Yes	Yes	State
Hawaii	Haw. Rev. Stat. Ann. §§ 671:11-617:20 (LexisNexis 2002 & Supp. 2004)	3 (1, 1, 1)	Yes (\$450)	Yes	Yes	No	Yes ^b	No	State
Idaho	Idaho Code §§ 6-1001-6-1011, 54-1809 (2004)	3 (1, 1, 1) ^c	No	Yes	Yes	No	Yes ^d	No	Provider fund
Indiana	Ind. Code Ann. §§ 34-18-8-1-34-18-10-26, 34-18-11-1-34-18-11-5 (Thompson/West 1999 & 2006 Supp.)	4 (3, 1, 0) ^e	Yes (\$5)	Yes	Yes	Yes	Yes	Yes	Winner pays
Louisiana	La. Rev. Stat. Ann. §§ 40:1299.391, 40:1299.47 (2001 & Thompson/West Supp. 2006)	4 (3, 1, 0) ^e	No ^f	Yes	Yes	Yes	Yes	Yes	Winner pays ^g
Maine	Me. Rev. Stat. Ann. tit. 24, §§ 2851-2859 (2000 & West Supp. 2005)	3 (1, 2, 0) ^h	Yes ⁱ (\$200)	Yes	Yes	Yes	Yes	No ^j	State
Massachusetts	Mass. Ann. Laws. ch. 231 § 60B (LexisNexis 2000 & Supp. 2005)	3 (1, 2, 0) ^k	No	Yes	Yes	No	Yes	Yes	State
Michigan	Mich. Comp. Laws Ann. §§ 600.4901-600.4923 (Thompson/West 2000)	5 (2, 3, 0)	Yes (\$75)	No	Limited ^l	Not clear	Yes ^m	No	Modified loser pays ⁿ
Montana	Mont. Code Ann. §§ 27-6-101-27-6-704 (2005)	6 (3, 3, 0)	No	Yes	Yes	Yes	Yes ^o	No	Provider fund
Nevada ^p	Nev. Rev. Stat. Ann. §§ 41A.003-41A.097 (LexisNexis 1996), (repealed 2002, see Ch. 3 Stat. of Nev. 2002 Special Session, 25)	6 (3, 3, 0) ^q	Yes (\$350)	Yes	Yes	No	Yes	Yes	State

		7 (3, 4, 0) ^r	No	Yes	Yes	Yes	Yes	No	Yes	No	Provider fund
New Mexico	N.M. Stat. Ann. §§ 41-5-14-41-5-24 (2003)										
Utah	Utah Code Ann. §§ 78-14-3-78-14-16 (LexisNexis 2002)	2 (1, 1, 0) ^s	No	Yes	Yes	No	Yes	No	Yes	No	State
Wisconsin	Wis. Stat. Ann. §§ 655.275, 655.42-655.68 (Thompson/West 2004)	3 (1, 1, 1)	Yes (\$11)	No	No	No	No	No	No	No	Provider fund

^aThe court determines the professions or specialties to be represented.

^bThe panel must decide the amount of economic and noneconomic damages, but may not recommend punitive damages.

^cThe panel may also have a hospital administrator as an additional member if a hospital is a defendant.

^dThe panel may recommend amounts of damages to be offered or accepted in settlement.

^eThe attorney chairperson does not vote.

^fLouisiana enacted a \$100 per named defendant filing fee in 2003. See La. Rev. Stat Ann. 40:1299.39.1 et seq., 40:1299.47 et seq. (Thompson/West Supp. 2006).

^gLouisiana converted to a modified loser pays model in 2003. See id.

^hThe chairperson may name one additional health-care provider if more than one defendant is named.

ⁱThe filing fee is \$200 per notice filed, with notice required for each defendant.

^jUnanimous findings as to fault and causation unfavorable to either plaintiff or defendant are admissible.

^kOne of the attorneys is a justice of the superior court.

^lNo testimony is permitted. However, it is possible that other forms of discovery would be permissible.

^mThe written evaluation of the panel includes an award covering the claim. If the parties accept the evaluation, judgment is entered in that amount, including all fees, costs, and interest to date.

ⁿModified loser pays indicates that the statute specifies certain conditions under which the loser will pay some or all of the panel costs.

^oThe panel may recommend an award. The panel may also approve a binding settlement agreement.

^pNevada legislatively abolished its panel in October 2002.

^qIf a hospital is named in the complaint, the panel may include a hospital administrator as a nonvoting member.

^rThe attorney chairperson does not vote except in case of tie.

^sThe panel may have a hospital administrator instead of a physician if a hospital is a defendant.

Table 3: Characteristics of State Groups

	State Groups by Panel Status			Difference in State Groups by Panel Status, p Value
	All States (N = 51)	States with No Panel (N = 31)	Optional Submission States (N = 7)	
<i>Socioeconomic Characteristics</i>				
Population distribution by age ^a				
18 years and under, mean (SD)	27 (2)	26 (2)	27 (1)	28 (3)
[95% CI], %	[26-27]	[26-27]	[26-27]	[26-30]
19 to 65 years, mean (SD)	61 (2)	61 (2)	61 (1)	60 (1)
[95% CI], %	[61-61]	[60-62]	[60-62]	[60-61]
Greater than 65 years, mean (SD)	12 (2)	12 (2)	12 (1)	12 (2)
[95% CI], %	[12-13]	[12-13]	[11-13]	[10-13]
Rural population as % of state total, mean (SD)	27.8 (15.3)	28.8 (16.5)	24.7 (10.0)	26.9 (15.4)
[95% CI] ^d	[23.5-32.1]	[22.8-34.9]	[15.4-34.0]	[17.6-36.2]
Educational attainment, as % of persons 25 years and older				
Completed high school, mean (SD)	85.5 (4.0)	84.4 (4.2)	88.3 (1.3)	86.6 (3.5)
[95% CI]	[84.4-86.6]	[82.9-85.9]	[87.1-89.5]	[84.5-88.8]
Bachelor's degree or higher, mean (SD)	26.4 (5.2)	25.9 (5.4)	31.5 (3.6)	24.8 (3.4)
[95% CI]	[24.9-27.8]	[23.9-27.8]	[28.1-34.9]	[22.7-26.8]
Median household income, mean (SD)	43,649 (6,669)	42,032 (5,780)	51,024 (5,243)	43,831 (7,196)
[95% CI], \$ ^e	[41,773-45,524]	[39,912-44,152]	[46,176-55,873]	[39,483-48,180]
Percentage of people in poverty, mean (SD)	11.6 (3.3)	12.4 (3.2)	8.3 (1.5)	11.3 (3.1)
[95% CI] ^f	[10.7-12.5]	[11.3-13.6]	[7.0-9.6]	[9.4-13.1]
Percentage of people without health insurance, mean, (SD)	13.5 (3.6)	13.8 (3.6)	10.8 (1.3)	14.0 (4.1)
[95% CI]	[12.4-14.5]	[12.4-15.1]	[9.6-12.0]	[11.6-16.5]
Medicaid spending per enrollee, mean (SD)	3,972 (1,223)	3,845 (1,268)	4,817 (1,150)	3,819 (1,063)
[95% CI] ^h	[3,628-4,316]	[3,384-4,306]	[3,753-5,881]	[3,177-4,462]
Medicare spending per beneficiary, mean (SD)	5,094 (886)	5,175 (871)	5,084 (756)	4,907 (1,015)
[95% CI] ⁱ	[4,845-5,343]	[4,856-5,495]	[4,385-5,783]	4,293-5,520]
<i>Judicial Frequency and Function</i>				
Civil filings per 100,000 population, mean (SD)	5,434 (2,975)	4,997 (2,587)	8,380 (4,883)	4,824 (1,393)
[95% CI] ^m	[4,580-6,289]	[4,013-5,981]	[3,864-12,896]	[3,983-5,666]

Appeals filed per 100,000 population, mean (SD) [95% CI] ^a	93 (49) [79-107]	95 (47) [77-112]	76 (21) [56-95]	98 (63) [60-136]	0.62 ^b
Cases disposed as % of cases filed, courts of general jurisdiction, mean (SD) [95% CI] ^c	96.6 (8.3) [94.0-99.2]	95.8 (9.0) [92.4-99.2]	97.9 (6.8) [89.4-106.4]	99.2 (6.2) [93.4-105.0]	0.59 ^c
<i>Significant Tort Reforms</i>					
Noneconomic damages cap: states with, states without					
(% of group with)					
\$250,000 or less	5, 46 (9.8)	2, 29 (6.5)	1, 6 (14.3)	2, 11 (15.4)	0.50 ^d
\$500,000 or less	13, 38 (25.5)	4, 27 (12.9)	1, 6 (14.3)	8, 5 (61.5)	0.004 ^d
\$1,000,000 or less	18, 33 (35.3)	6, 25 (19.4)	2, 5 (28.6)	10, 3 (76.9)	0.001 ^d
\$1,500,000 or less	20, 31 (39.2)	6, 25 (19.4)	3, 4 (42.9)	11, 2 (84.6)	<0.001 ^d
Collateral source offset: states with, states without	31, 20 (60.8)	18, 13 (58.1)	3, 4 (42.9)	10, 3 (76.9)	0.30 ^d
(% of group with)					
Statute of limitations, mean (SD)	2.3 (0.7)	2.1 (0.6)	2.6 (1.1)	2.5 (0.8)	0.37 ^b
[95% CI], years	[2.1-2.5]	[1.9-2.4]	[1.5-3.6]	[2.0-2.9]	
Patients compensation fund (PCF): PCF premium, commercial premium, \$millions	718, 9,000 (7.39)	446, 7,409 (5.68)	37, 600 (5.81)	236, 991 (19.23)	<0.001 ^{d,e}
(PCF premium as % of total premium)					
Provider affidavit of merit: states with, states without	13, 38 (25.5)	9, 22 (29.0)	2, 5 (28.6)	2, 11 (15.4)	0.65 ^d
(% of group with)					

^aData are for 2002-2003.

^bKruskal-Wallis test.

^cOne-way ANOVA.

^dData are for 2000.

^ePairwise comparison finds a borderline significant difference between states with no panel and optional submission states, $p = 0.054$.

^fPairwise comparison finds a significant difference between states with no panel and optional submission states, $p = 0.01$, and a significant difference between optional submission states and mandatory submission states, $p = 0.004$.

^gData are the median money income for 2001-2002.

^bTukey-Kramer multiple comparisons finds a significant difference between states with no panel and optional submission states, $p = 0.003$, and a significant difference between optional submission states and mandatory submission states, $p = 0.04$.

^cData are the 2001–2002 two-year average.

^dPairwise comparison finds a significant difference between states with no panel and optional submission states, $p = 0.005$, and a significant difference between optional submission states and mandatory submission states, $p = 0.03$.

^eData are for 2000.

^fData are for 1998.

^gData are for 2000. Data are missing for two states in the no panel group.

^hData are for 2001. Data are missing for one state in the no panel group.

ⁱData are a two-year average of values for 2001 and 2002. Data are missing for two, one, and five states in the no panel, optional submission, and mandatory submission groups, respectively.

^jFisher exact probability test.

^kChi-square analysis.

^lStandardized residuals are as follows: no panel; PCF premium -5.6 , commercial premium $+1.58$; optional submission; PCF premium -1.47 , commercial premium $+0.42$; mandatory submission; PCF premium $+15.24$, commercial premium -4.31 .

ABBREVIATIONS: *SD* indicates standard deviation; *CI* indicates confidence interval. Data are for 2002 unless otherwise specified.

SOURCES: Calculations are based on data from reports by the American Medical Association, the National Conference of State Legislatures, the law firm of McCullough, Campbell, and Lane (Chicago), the Kaiser Family Foundation statehealthfacts.org, the Northeast-Midwest Institute, the U.S. Census Bureau, the National Center for State Courts, a custom project report performed by the A.M. Best Co. (Oldwick, NJ, unpublished data), the National Practitioner Data Bank, the Medical Liability Monitor (Chicago), and individual state sources. Data are for 2002 unless otherwise specified.

tion living in rural areas, for the percentage of people without health insurance, for Medicaid spending per enrollee, or for Medicare spending per beneficiary. Significant baseline between-groups differences were identified for high school completion rates, for achievement of a bachelor's degree or higher, for median household income, and for percentage of people in poverty. Pairwise comparison found borderline significance in the difference between rates of completion of high school for the optional submission states and states with no panel (88.3 percent vs. 84.4 percent, $p = 0.054$). Pairwise comparison also found significant differences in rates of achievement of a bachelor's degree or higher between states with no panel and mandatory submission states (25.9 percent vs. 24.8 percent, $p = 0.01$) and between optional submission states and mandatory submission states (31.5 percent vs. 24.8 percent, $p = 0.004$). In pairwise comparison to states with no panel and to mandatory submission states, the optional submission states also had a higher median household income (\$51,024 vs. \$42,032, $p = 0.003$, and vs. \$43,831, $p = 0.04$, respectively), and a lower percentage of people in poverty (8.3 percent vs. 12.4 percent, $p = 0.005$, and vs. 11.3 percent, $p = 0.03$, respectively).

There was no significant difference between the state groups as to measures of frequency of judicial filings for total civil filings or for filings of appeal, or of judicial function measured as cases disposed as a percentage of cases filed in courts of general jurisdiction. There was no significant difference between the state groups as to the presence of collateral source reform (defined as either discretionary or mandatory collateral source offset), or as to use of a provider affidavit of merit. No significant difference was noted between the state groups as to the presence of a noneconomic damages cap of \$250,000 or less. However, there was a significant difference between the state groups as to use of a cap on damages of \$500,000 or less ($p = 0.004$). A noneconomic damages cap of \$500,000 or less was identified in 12.9 percent of states with no panel, in 14.3 percent of optional submission states, and in 61.5 percent of mandatory submission states. There was no significant difference between the state groups in the length of the statute of limitations, defined as years from the date of injury. Additionally, a linear regression analysis of the population data found no relationship between the length of the statute of limitations and the time from incident of malpractice to payment of claim ($r = 0.079$, $p = 0.58$). There was a highly significant difference between the state groups in the relative amount of premium written by a patients compensation fund (PCF) or other excess layer fund ($p < 0.001$). The mandatory submission states had 19.23 percent of total premium written

by PCF or excess layer funds, as opposed to 5.81 percent for optional submission states and 5.68 percent for states with no panel.

There was no significant difference in the state groups for cost measures, including the paid loss ratio, the paid defense cost ratio, and the reported physician malpractice payment (Table 4). Likewise, the timeliness and efficiency measures of time from incident of malpractice to payment of claim, dollars of defense cost per dollar of paid loss, and the ratio of paid to unpaid claims showed no significant difference between the unadjusted group means. There was also no significant difference between the state groups for the reported annual malpractice premium for internal medicine, general surgery, or obstetrics/gynecology. However, power analysis for the between-groups analysis of these variables found relatively large values for minimum detectable difference, and thus the potential for Type II error exists, principally generated as a function of the small size of the population and the state groups.

After adjusting for significant covariates among socioeconomic characteristics, judicial system frequency and function, and statutory tort reforms (including a provider affidavit of merit and the length of the statute of limitations), multiple regression analyses found no relationship between the predictor variable, panel status, and any of the dependent variables of cost, timeliness, and efficiency of medical malpractice claims resolution (p values > 0.05) (Table 5).

V. DISCUSSION

This study demonstrated that, for the year studied, the presence or absence of a statutory medical malpractice review panel for claims of malpractice at the state level was not associated with a significant difference in traditional measures of medical liability system cost as defined by the paid loss ratio and the paid defense cost ratio. Likewise, the panel status of a state had no significant association with the reported physician malpractice payment, or with the reported annual malpractice premium for three medical specialties.

Regarding the timeliness and efficiency of the medical liability system, the presence or absence of a statutory medical malpractice review panel had no significant association with the time from incident of malpractice to payment of claim, with the ratio of paid to unpaid claims, or with the dollars of defense cost paid per dollar of paid loss. These findings were independent of the effects of a requirement for an affidavit of merit by a health-care

Table 4: Measures of Cost, Timeliness, and Efficiency of Resolution of Malpractice Claims in States with No Panel, Optional Submission Panel, and Mandatory Submission Panel, 2002

	State Groups by Panel Status				Difference in State Groups by Panel Status, p Value
	All States (N = 51)	States with No Panel (N = 31)	Optional Submission States (N = 7)	Mandatory Submission States (N = 13)	
Paid loss ratio, mean (SD)	61.23 (19.07)	61.04 (18.16)	70.14 (22.22)	56.88 (19.43)	0.34 ^a
[95% CI], %	[55.87-66.60]	[54.38-67.71]	[49.59-90.69]	[45.14-68.62]	
Paid defense cost ratio, mean (SD)	17.95 (5.10)	17.70 (5.32)	16.70 (4.75)	19.22 (4.85)	0.53 ^a
[95% CI], %	[16.52-19.38]	[15.75-19.65]	[12.31-21.09]	[16.28-22.15]	
Reported physician malpractice payment, mean (SD)	288,291 (91,546)	289,363 (82,265)	324,631 (118,665)	269,630 (98,404)	0.45 ^a
[95% CI], \$ ^b	[262,543-314,039]	[259,187-319,537]	[214,885-434,378]	[210,165-329,094]	
Internal medicine reported annual malpractice premium, mean (SD)	11,086 (8,161)	11,970 (8,488)	7,392 (2,614)	10,968 (9,163)	0.45 ^c
[95% CI], \$	[8,791-13,382]	[8,857-15,084]	[4,975-9,809]	[5,431-16,505]	
General surgery reported annual malpractice premium, mean (SD)	36,985 (23,743)	38,914 (25,578)	27,935 (10,255)	37,257 (24,563)	0.70 ^c
[95% CI], \$	[30,307-43,663]	[29,532-48,296]	[18,451-37,419]	[22,414-52,101]	
Obstetrics/gynecology reported annual malpractice premium, mean (SD)	57,296 (33,572)	59,083 (36,505)	50,811 (23,041)	56,564 (32,700)	0.96 ^c
[95% CI], \$	[47,854-66,739]	[45,693-72,473]	[29,502-72,120]	[36,803-76,324]	
Time from incident of malpractice to payment of claim, mean (SD)	4.16 (0.86)	4.00 (0.87)	4.47 (0.48)	4.35 (0.96)	0.07 ^c
[95% CI], y	[3.92-4.40]	[3.69-4.32]	[4.03-4.92]	[3.78-4.94]	
\$ Paid defense cost per \$ paid loss, mean (SD)	0.32 (0.16)	0.32 (0.15)	0.25 (0.07)	0.38 (0.19)	0.11 ^c
[95% CI], \$	[0.28-0.37]	[0.26-0.37]	[0.18-0.31]	[0.27-0.49]	
Ratio of paid to unpaid claims, mean (SD)	0.35 (0.22)	0.34 (0.18)	0.31 (0.09)	0.42 (0.33)	0.93 ^c
[95% CI]	[0.29-0.42]	[0.27-0.40]	[0.23-0.40]	[0.22-0.62]	

^aOne-way ANOVA.

^bData are mean of 2001 and 2002 values.

^cKruskal-Wallis test.

ABBREVIATIONS: SD indicates standard deviation; CI indicates confidence interval.

SOURCES: Calculations are based on data from a custom project report performed by the A.M. Best Co. (Oldwick, NJ, unpublished data), and on data from reports from individual state sources, the National Practitioner Data Bank, and the Medical Liability Monitor (Chicago). Data are for 2002 unless otherwise specified.

Table 5: Results of Multiple Regression Analysis, Predictor Variable—Panel Status (No Panel, Optional Submission Panel, Mandatory Submission Panel)

<i>Dependent Variable</i>	<i>Significant Covariates</i>	<i>Association of Dependent Variable with Panel Status</i>
Paid loss ratio	Medicare spending per beneficiary ($p = 0.04$)	NS ($p = 0.90$)
	Filings for appeal per 100,000 population ($p = 0.04$)	
Paid defense cost ratio	None	NS ($p = 0.51$)
Reported physician malpractice payment	Medicare spending per beneficiary ($p = 0.03$)	NS ($p = 0.70$)
	Cases disposed as a % of cases filed, courts of general jurisdiction ($p = 0.04$)	
	Noneconomic damages cap $< \$250,000$ ($p = 0.02$)	
\$ Defense cost per \$ paid loss	None	NS ($p = 0.45$)
Internal medicine reported annual malpractice premium	Percentage of people without health insurance coverage ($p = 0.002$)	NS ($p = 0.34$)
	Medicare spending per beneficiary ($p = 0.003$)	
	Cases disposed as a % of cases filed, courts of general jurisdiction ($p = 0.003$)	
General surgery reported annual malpractice premium	Percentage of population greater than 65 years of age ($p = 0.01$)	NS ($p = 0.50$)
	Percentage of people without health insurance coverage ($p = 0.004$)	
	Medicare spending per beneficiary ($p = 0.008$)	
	Cases disposed as a % of cases filed, courts of general jurisdiction ($p = 0.03$)	
Ob-gyn reported annual malpractice premium	Percentage of population greater than 65 years of age ($p = 0.03$)	NS ($p = 0.79$)
	Percentage of people without health insurance coverage ($p = 0.04$)	
	Medicare spending per beneficiary ($p = 0.004$)	
Time from incident of malpractice to payment of claim	Medicare spending per beneficiary ($p < 0.001$)	NS ($p = 0.09$)
Ratio of paid to unpaid claims	Median household income ($p = 0.01$)	NS ($p = 0.25$)
	Percentage of people in poverty ($p = 0.01$)	

ABBREVIATIONS: NS indicates not significant.

provider. The findings were also independent of the effects of measures of socioeconomic differences, judicial system frequency and function, and other associated tort reforms (including a noneconomic damages cap, a collateral source offset, the length of the statute of limitations, and a patients compensation fund or excess layer fund).

This study was subject to several limitations. The predictor variable, panel status, was nonhomogenous. As seen in Tables 1 and 2, the statutory construction and operation of medical review panels is not uniform among the states. Effects of statutory provisions of panel construction and operation in a given state may impact measures of overall malpractice system cost, timeliness, and efficiency in a manner that could have affected the results of this study. Other variables of socioeconomic, statutory, or judicial function not tested in this study may have had similar effects. This cross-sectional study of measures of malpractice system cost, timeliness, and efficiency was based on analysis of a single-year experience, and generalization of such a result to the complex and dynamic medical liability system is limited. Additionally, this study was not designed to evaluate whether malpractice review panels are associated with changes in claim frequency or in relative frequencies of resolution of claims in favor of plaintiffs or defendants, as standardized state-specific data on these points are not available.

Capitalization and self-insurance issues within the medical malpractice insurance market in individual states may have impacted the results of this study. Regarding capitalization, it has been previously noted that the use of an excess layer or patients compensation fund may allow risk to be priced at a discount to that of the commercial insurance market by allowing premium or surcharge to be discounted in the presence of unfunded liabilities. In states with these mechanisms, the presence of significant unfunded liabilities in the excess layer funds may allow premium to be understated compared to that written for a similar degree of risk in a state without such a fund. This effect could have produced a relative overstatement of the paid loss ratio and the paid defense cost ratio in the states with patients compensation or excess layer funds. The other dependent variables considered in this study did not depend on written premium and should not be subject to this effect. A correction for state differences in capitalization of the commercial insurance market and the excess layer funds was beyond the scope of this study.

Self-insurance of risk results in a diversion of premium dollars from the commercial insurance market, thereby decreasing the written premium within a state. It is possible that this effect could influence paid loss and paid defense cost ratios in a given state. However, paid losses and paid defense

costs for the self-insurance market are not reported in the commercial insurance statistics, and the effect of self-insurance on the paid loss and paid defense cost ratios derived from analysis of the commercial market data is probably thereby limited. The effect may be most notable in states that combine a significant amount of self-insurance in the commercial layer with a significant amount of premium in an excess layer fund. Although influenced by the level of the attachment point for PCF payments, the net effect on the paid defense cost ratio and the paid loss ratio in most of these instances should be to overstate these ratios compared to the commercial insurance market. The other dependent variables in this study should not have been subject to this effect. No systematic data are available to estimate the size of the self-insurance market in individual states, and a correction for the effects of self-insurance was also beyond the scope of this study.

The study is also constrained by the relatively small size of the population ($N=51$) and of the three state groups necessitated by the cross-sectional design and the state-level sampling method. This constraint limits the ability of the analysis to detect relatively small between-groups differences in means. These results do not allow the conclusion that medical malpractice review panels have no effect on the dependent variables measured, but they do raise questions as to whether any such effect exists.

Given these limitations, the findings of this study are consistent with prior studies that have found mixed or marginal effects of the use of a medical malpractice review panel on cost and efficiency of the medical liability system.⁴⁰ In the construct of this study, the statutory provision for the mandatory or optional submission of a claim to a medical malpractice review panel was not associated with lower medical liability system cost or with improved system timeliness or efficiency when compared to the presence of no panel. However, it is also notable that mandatory or optional submission panels were not associated with a prolongation of the timeliness of claim resolution nor were they associated with increased medical liability system cost or physician malpractice premiums for the year under study. It is possible that such findings could reflect a shift of some of the cost and time spent in discovery for meritorious medical malpractice claims from the litigation process to the prelitigation process. These findings could also reflect resolution of nonmeritorious claims in a manner that, from the

⁴⁰Danzon, *supra* note 14; Off. Leg. Aud. Gen., *supra* note 13; O.T.A., *Impact of Legal Reforms*, *supra* note 14.

standpoint of system cost, efficiency, and timeliness, does not substantially differ regardless of whether a litigation or prelitigation process is used. These observations are consistent with the hypothesis that medical malpractice review panels are a statutory reform of secondary or neutral effect.

These findings are relevant to current public policy debates regarding medical malpractice at both the federal and state levels. In the 2004 presidential campaign, Senator John Kerry proposed to “require states to ensure the availability of non-binding mediation in all malpractice claims before cases proceed to trial.”⁴¹ The campaign of President George Bush responded that “a panel system would require that every case be tried twice, with the first time by an ultra-expensive panel of doctors and lawyers” and indicated that such a plan would probably increase costs of litigation.⁴²

In 2002, Nevada abolished its mandatory submission panel and replaced it with a mandatory pretrial settlement conference.⁴³ In legislative testimony, Governor Kenny Guinn urged repeal of the panel statute, stating that “the screening panels have not met the purposes for which they were created.”⁴⁴ Subsequently, the Nevada Legislature considered reinstating panels, but the measure failed.⁴⁵ An extensive econometric analysis of the effects of Nevada malpractice panels published in 2004 found that panels had decreased the percentage of claims requiring resolution by the courts but did not affect payments to plaintiffs, costs of claim processing, or time for claim resolution.⁴⁶

On two occasions since the 1980s, the Wyoming Supreme Court found legislative enactment of that state’s malpractice panel to be unconstitutional, holding that the panel statute was not rationally related to a legitimate state

⁴¹John Kerry & John Edwards, *Our Plan for America: Stronger at Home, Respected in the World* 111 (Perseus Books Group, 2004).

⁴²BC ‘04 Policy Department, *Bush-Cheney ‘04 Inc; Memorandum* (Sept. 9, 2004).

⁴³Act of Aug. 7, 2002, ch. 3, 2002 Statutes of Nevada 8, 25.

⁴⁴Governor Kenny C. Guinn, *Testimony of Governor Kenny C. Guinn: 18th Special Session of the Nevada State Legislature, July 29, 2002*, available at <http://gov.state.nv.us/SpecialMedSession_speech.htm>.

⁴⁵Keep Quality Medical Care in Nevada Act, S.B. 97, 72d Leg. §§ 12–32 (Nev. 2003).

⁴⁶Albert Yoon, *Mandatory Arbitration and Civil Litigation: An Empirical Study of Medical Malpractice Litigation in the West*, 6 *Am. L. & Econ. Rev.* 95 (2004).

interest.⁴⁷ At the recommendation of Governor Dave Freudenthal and the Wyoming Healthcare Commission, the Wyoming Legislature in 2004 approved Constitutional Amendment C, granting the legislature the right to enact a mandatory review panel, and the voters ratified the amendment in November 2004.⁴⁸ The President of the American Medical Association stated: “This is an important step toward weeding out meritless cases and reducing health care costs in Wyoming.”⁴⁹ The Wyoming Legislature enacted a mandatory submission panel statute in 2005, stating that among its purposes were to make possible the fair and equitable disposition of well-founded malpractice claims and to prevent, “where possible,” the filing in court of claims in which the facts do not support a “reasonable inference of malpractice.”⁵⁰

In 2005, the New Hampshire Legislature converted that state’s panel from optional to mandatory status, with a statement of legislative intent noting: “The panel process will encourage the prompt resolution of claims.”⁵¹ In 2004, several committees of the Connecticut Legislature considered bills seeking to make the existing medical review panel mandatory,

⁴⁷*Hoem v. State*, 756 P.2d 780 (Wyo. 1988); *State ex rel. Wyoming Ass’n of Consulting Eng’rs & Land Surveyors v. Sullivan*, 798 P.2d 826 (Wyo. 1990); see Jackie Cohen, Recent Developments in Health Law: The Latest Face of Medical Review Panels in Wyoming, 33 *J.L. Med. & Ethics* 388 (2005) (providing a general history of legislative and judicial actions regarding medical malpractice review panels in Wyoming).

⁴⁸Wyoming Healthcare Commission, 2004 Legislative Recommendation: Recommendations 1 and 2—Medical/Legal Reform (Casper, Nov. 24, 2003), available at <<http://www.wyominghealthcarecommission.org/Archives/index.html>> (follow “2004 Legislative Recommendations: Recommendations 1and 2 - Medical/Legal Reform” hyperlink); Wyo. Const. art. 10, § 4(b)(i).

⁴⁹Press Release, John C. Nelson, American Medical Association, AMA: Wyoming Voters Take Important Step to Reduce Healthcare Costs (Chicago, Nov. 5, 2004).

⁵⁰Wyoming Medical Review Panel Act of 2005, H.E.A 134, 58th Leg., 2005 Wyo. Gen. Sess. (Wyo. Stat. 9-2-1513 et seq.). Although the Act provides that “no complaint alleging malpractice shall be filed in any court against a healthcare provider before a claim is made to the panel and its decision is rendered,” the Act does allow exceptions for claims subject to a valid arbitration agreement and for those in which both parties provide a written request for waiver of submission to the panel. Also, if a health-care provider fails to timely file answer to the claim, the plaintiff may proceed to court.

⁵¹An Act relative to screening panels for medical injury claims, ch. 197, 2005 N.H. Laws, p. 1.

but none of these were successful.⁵² That same year, a Connecticut bill requiring, among several provisions, mandatory court-supervised mediation of malpractice actions passed,⁵³ but was vetoed by Governor John Rowland, who stated that the act “creates the illusion of reform.”⁵⁴ In 2005, Connecticut eliminated its medical malpractice review panel entirely as part of a wide-ranging medical malpractice litigation and insurance reform act.⁵⁵

After more than 30 years of use, medical malpractice review panels remain controversial. Debate will no doubt continue as to whether medical malpractice review panels reduce the frequency of nonmeritorious judicial filings and decrease system costs, or prolong the judicial process and raise costs. Given the complexity of the medical liability system, definitive data on the general effectiveness of malpractice review panels will likely never be obtained. If history is our guide, this issue will be contentious for many years to come.

⁵²See Janet L. Kaminski, Office of Legislative Research, Connecticut General Assembly, Report 2004-R-0736: Medical Malpractice—2004 Session Summary (Hartford, Sept. 22, 2004), available at <<http://www.cga.ct.gov/2004/rpt/2004-R-0738.htm>>, for a discussion of these and other 2004 malpractice introductions.

⁵³An Act Concerning Medical Malpractice Insurance Reform, 2004 Sess., Pub. Act No. 04-155, 2004 Conn. Acts (Reg. Sess.) (vetoed May 12, 2004). See George Coppolo, Office of Legislative Research, Connecticut General Assembly, Report 2004-R-0522: Medical Malpractice—Connecticut Legislation—2004 (Hartford, June 23, 2004), available at <<http://www.cga.ct.gov/2004/rpt/2004-R-0522.htm>>, for a discussion of the provisions of the vetoed measure.

⁵⁴Governor John G. Rowland, To the Honorable Susan Bysiewicz, Secretary of State (May 13, 2004), available at <<http://www.ct.gov/governorowland/cwp/view.asp?A=1326&Q=273522>>.

⁵⁵An Act Concerning Medical Malpractice. 2005 Sess., Pub. Act No. 05-275, 2005 Conn. Acts (Reg. Sess.).