

**The Impact of Medical Liability Reform on
Access to Health Care in Texas**

William G. Hamm, Ph.D.

C. Paul Wazzan, Ph.D.

Lisa A. Marovich, Ph.D.

Jeannie Kim Wong

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William G. Hamm, Ph.D.

Berkeley Research Group

Managing Director

bhamm@thinkbrg.com

William G. Hamm is an economic consultant with high-level experience in both government and business. An expert on public finance, financial institutions, and mortgage finance, Dr. Hamm headed the non-partisan Legislative Analyst's Office in California, where he earned a nationwide reputation for objectivity, expertise, and credibility on public policy issues ranging from taxation to health care. He also spent eight years in the Executive Office of the President in Washington, D.C., where he headed a division of OMB responsible for analyzing the programs and budgets of the Department of Labor, the Department of Housing & Urban Development, the Veterans Administration, and numerous other federal agencies. After leaving public service, Dr. Hamm was the executive vice-president/chief operating officer of an AAA-rated \$50 billion bank. He has also run a \$1.5 billion loan servicing business for an S&P 500 company.

As a consultant, Dr. Hamm specializes in helping courts, legislative bodies, and the public develop a better understanding of complex economic and public policy issues. He assists businesses and public agencies analyze existing and proposed government policies, develop sound policy alternatives, and communicate the results to decision-makers. He is also recognized as an effective expert witness who can clarify complex litigation issues for triers of fact.

Dr. Hamm has a B.A. from Dartmouth College and a Ph.D. in Economics from the University of Michigan. He is a member of the American Economic Association and the American Law and Economics Association. He is also a Fellow of the National Academy for Public Administration, a Founding Principal of the Council for Excellence in Government, and a member of Grameen Foundation USA's Board of Directors.



C. Paul Wazzan, Ph.D.

FTI Consulting

Senior Managing Director

paul.wazzan@fticonsulting.com

C. Paul Wazzan, Ph.D. is a Senior Managing Director with FTI Consulting's Forensic & Litigation Consulting segment. Dr. Wazzan specializes in providing financial, economic and statistical expertise in the areas of complex damages, finance, (e.g., valuation, corporate finance, securities fraud/10b5, option valuation, class certification, pricing of mortgage risk and MBS/CDOs, commodities price manipulation), intellectual property (e.g., patent, trademark and copyright infringement, theft of trade secrets), labor and employment (e.g., class certification, managerial misclassification, wage & hour, discrimination), antitrust and competition policy (e.g., market definition, merger analysis, predatory pricing, price-fixing, exclusionary conduct, price discrimination, attempted monopolization) and public policy.

Dr. Wazzan also specializes in large scale (i.e., millions of records) data analytics (e.g., data acquisition, database design and development and statistical/econometric analysis).

Dr. Wazzan's analyses have covered a wide range of industries, including basic manufacturing (e.g., automotive, mining, oil and gas, steel, food processing, and distribution); high-tech (e.g., aircraft and avionics, semiconductors, digital signal processors, computer peripherals); real estate (e.g., appropriate interest rates in bankruptcy settings, lending discrimination); financial services (e.g., banking, metals and other commodities trading, organized financial markets) and pharmaceuticals (e.g., pricing of proteins, drugs and the modeling of expected sales).

Dr. Wazzan's research has been published in peer-reviewed economics journals and law reviews, and he has testified in a wide range of matters in Federal, State and Bankruptcy Courts, the International Trade Commission, domestic and international arbitration proceedings, and in front of legislative bodies. In addition, his testimony has been featured and relied upon in published judicial decisions.

Dr. Wazzan is president and CEO of Wazzan & Co. Investment LLC, a venture capital firm providing seed level funding to firms specializing in semiconductor, optical networking, bio-mechanical, bio-medical, and related technologies.

Dr. Wazzan has been an adjunct assistant professor of business and economics at California State University, Los Angeles and has also taught MBA classes at the University of Southern California, Marshall School of Business. Dr. Wazzan uses his experience in accounting, finance, and various industries to lead dispute consulting and forensic investigatory engagements mainly related to complex financial, employment and accounting litigation matters.

Executive Summary

This report seeks to provide answers to two questions that are important to the Texas Legislature and the People of Texas generally:

1. Was the Legislature's cap on subjective (non-economic) damages effective in improving access to health care in Texas?
2. How would access to health care for Texas residents be affected if the Legislature raised the cap on subjective damages (as H.B. 719 from the 2017 legislative session would have done)?

Summary of Findings

The evidence we analyzed indicates that an increase in the cap on awards for subjective damages will slow or reverse the post-reform gains in the number of physicians per capita, and thereby diminish access to medical care for residents of Texas.

1. Increasing the cap would make Texas a less-attractive state in which to practice medicine, and thus result in fewer physicians than otherwise establishing or maintaining a practice within the State. This will bring about a reduction in access to needed medical care for Texas residents.
2. A higher cap will cause physicians in many different specialties to manage their practices as they did during the 2000-2003 period and limit the high-risk patients they see and the high-risk procedures they perform. Some physicians will also shift away from high-risk specialties. For example, the evidence suggests that a higher cap will lead to a reduction in the number of doctors delivering babies, as more obstetricians restrict their practices to gynecology only.
3. Patients with high-risk conditions, minorities such as African-Americans and Hispanics, patients residing in rural areas, the uninsured, and the working poor would be disproportionately affected by the reductions in the supply of health care resources brought about by a higher cap.
4. An increase in the cap on non-economic damages would reduce the ability of community hospitals, clinics, and health centers to serve lower income families. It will likely reduce charitable care to these families as well, or cause rural governmental hospitals to raise taxes in order to replace funds used for increased liability costs

Background

In 2003, the Legislature concluded that the increase in medical liability claims since 1995 “...caused a serious public problem in availability of and affordability of adequate medical professional liability insurance.”¹ To bring an end to what the American Medical Association and many other observers called a “medical liability crisis,” the Legislature enacted a series of tort reforms designed to improve Texans’ access to health care. The most important of these reforms was a stacked cap on non-economic damages awards. This cap allows successful plaintiffs to recover an amount equal to (1) 100% of the economic damages they incurred, plus (2) up to \$750,000 in compensation for subjective damages.

Has the Cap Improved Access to Health Care in Texas?

To determine whether the cap was successful in improving access to health care for Texas residents, we used data from the Texas Medical Board (“TMB”) to compare the change in the number of physicians per capita during the Crisis Period (1997-2002) with the change after the cap took effect. We supplemented this data with the results of physician surveys and published data from other reliable sources.

Our findings may be summarized as follows:

1. Texas saw a large influx of new doctors after the cap took effect. The TMB – the State’s physician licensing agency – credited the cap and other tort reforms for producing this influx.
2. The reforms greatly accelerated the rate at which the number of active physicians increased relative to the State’s population. Had the per capita number of active physicians continued to grow after the reforms took effect at the pre-reform rate, there would be today 18.6 fewer physicians for each 100,000 Texas residents.
3. Following the 2003 reforms, the annual rate of increase in the per capita supply of active doctors either accelerated or went from negative to positive for six of the eight most-important medical specialties.
4. Although the rate of increase in the number of physicians per capita number of active OB-GYN doctors did not increase after 2003, it would be a mistake to interpret the post-reform slow-down as evidence that the reforms have not had a favorable impact on Texans’ access to OB/GYN

¹ Texas H.B. 4, “A Bill to be Entitled an Act Relating to Reform of Certain Procedures and Remedies in Civil Actions,” effective September 1, 2003, pp. 85-86.

physicians. During the post-Crisis period, the total number of new OB/GYN specialists in the United States as a whole has failed to keep pace with the growing number of women of child-bearing age. As a result of the reforms, however, Texas has fared significantly better than most other states in attracting and retaining OB/GYNs.

5. The data show that access to needed medical care, including access to key specialists, has also improved in Texas' rural areas.
6. The data indicate that the cap has proven to be especially effective in improving access to needed medical care in areas where racial and ethnic minorities reside. For example, in those 33 counties with the largest concentrations of Hispanics, the number of physicians per capita declined during the Crisis Period and then increased by 30.2% in the post-Crisis Period. The rate of growth in the number of physicians per capita also increased for all high-risk specialties. The data show similar improvements for those 11 counties where African-Americans comprise at least 20% of the population, although these counties account for only 2% of the State's total population.
7. The data from the AMA show that during 2000-2003, Texas ranked 41st in the nation in annual growth of supply of patient care physicians per capita. After the 2003 reforms, Texas jumped to 21st place for the period 2007-2010.
8. In the aftermath of the reforms, Texas physicians were far more willing to treat patients with complex or high-risk cases. During the Crisis Period, 61% of physicians who responded to a survey conducted by the TMA said they had begun refusing to treat or referring complex or high-risk cases, primarily because of "professional liability pressures." Of the respondents to a 2010 survey, 28% reported that they had begun accepting complex or high-risk cases that they previously referred or denied. *All* of these respondents stated that the perceived or expected medical liability climate was an "important" reason for their willingness to accept these cases.
9. Hospitals in Texas report that a significant portion of their cost savings from the 2003 reforms went towards assisting patients who were underinsured and/or uninsured, giving these patients greater access to needed medical services.

What Are the Likely Consequences of Raising the Cap on Non-Economic Damages?

1. The data available from the Texas Medical Board do not allow us to *quantify* the likely impact that a higher cap would have on access to needed health care for Texas residents. Because past behavior is usually a good indicator of future behavior when economic conditions are similar, comparing trends in the supply of physicians per capita during the Crisis- and post-Crisis periods provides a sound basis for characterizing the likely impact of a higher cap.
2. The starting point for predicting the likely impact of a higher cap is the environment that prevailed for Texas medical care providers immediately before the HB 4 cap was imposed in 2003. As documented in this report, key features of this environment included:
 - The withdrawal of 82% of medical liability insurers from the Texas market;
 - Excessive rates of litigation against physicians, with up to three medical liability lawsuits filed per doctor in some areas;
 - A high rate of non-meritorious lawsuits – 85% of the total – brought against physicians, saddling them with heavy reputational and financial costs and reducing their opportunities to treat patients in need of care;
 - Rapidly rising medical liability insurance premiums for those physicians and hospitals fortunate enough to obtain insurance from private carriers;
 - A widespread unwillingness on the part of specialists to treat patients with complex or high-risk diagnoses; and
 - Declining numbers of physicians per capita in certain key specialty areas, such as cardiology, OB/GYN, anesthesiology, neurosurgery, and orthopedics, as well as in primary care.
3. As the data cited in this report demonstrates, these unfavorable trends were reversed following the adoption of the HB 4 cap that limited awards for subjective damages to \$250,000 for physicians. Following H.B. 4's effective date:
 - Medical liability insurers began returning to the Texas market: after declining from 17 to 3 between 2001 and 2003, the number of medical liability carriers writing insurance in Texas increased to 30 by May 2007;

- Lawsuits – especially non-meritorious lawsuits – targeting physicians declined by nearly 50 percent from the inflated levels reported for the Crisis Period;
- Medical liability insurance premiums fell sharply, and insurance became more accessible to physicians and hospitals and, therefore, to sick and injured patients with valid medical liability claims;
- Physicians became significantly more willing to treat patients with complex or high-risk diagnosis;
- The numbers of physicians per capita statewide, as well as in most key specialty areas, improved relative to Crisis Period trends;
- Access to needed health care increased in areas with large concentrations of Hispanics and African-Americans, across all specialties including high-risk specialties; and
- Hospitals used part of their savings on medical liability insurance to increase charity care for low-income patients.

The before-and-after comparison provides compelling evidence that an increase in the cap on awards for subjective damages will slow or reverse the post-reform gains in the number of physicians per capita, and thereby diminish access to medical care for residents of Texas.

The immediate effect of an increase in the cap would be to encourage more lawsuits against physicians and hospitals, particularly non-meritorious suits – the type of suit that caps are most effective in discouraging. As the number of lawsuits increases and physicians become more vulnerable to the financial, reputational, and practice-related costs that accompany such suits, physicians will once again begin restricting the services they provide to high-risk patients, shift away from high-risk specialties, and move to areas (including other states) that are less litigious or offer other economic advantages.

Patients with high-risk conditions, minorities such as African-Americans and Hispanics, patients residing in rural areas, the uninsured, and the working poor would be disproportionately affected by the reductions in the supply of health care resources brought about by the higher cap. For example, we would expect to see a reduction in the number of doctors delivering babies and more obstetricians restricting their practice to gynecology only.

In general, increasing the caps would make Texas a less-attractive state in which to practice medicine, and thus result in fewer physicians establishing or maintaining a practice within the State. This will bring about a reduction in access to needed medical care for Texas residents.

Table of Contents

I. Introduction	1
II. Background	2
A. Initial Efforts to Improve Access to Health Care by Limiting Non-Economic Damages Awards	2
B. The Health Care Crisis in Texas	3
C. The 2003 Reform	5
D. The Legislature’s Objectives in Enacting the Cap on Non-Economic Damages	6
III. Analytical Framework and Methodology	6
A. Analytical Framework	6
How the Tort System Affects Access to Health Care	7
How the Tort System Affects the Cost of Health Care	8
B. Methodology	9
C. Data	12
IV. The Impact of the 2003 Reforms on Access to Health Care	14
A. Licensing	14
B. Rate of Increase in the Number of Active Physicians Per Capita	15
C. Medical Specialties	16
D. Licensed Physicians in Rural Areas	20
E. Access to Physician Services in Predominantly Minority Areas	21
F. Experience of Licensed Physicians in Texas	22
G. Texas’s National Ranking	23
H. Texas’s Success in Retaining Medical Students	24
I. Willingness of Physicians to Treat High-Risk Patients	25
J. Reduction in Hospital Liability Costs	28
K. Charity Care	28
L. Conclusion	29
V. Likely Consequences of Raising the Cap on Non-Economic Damages	29

I. Introduction

1. According to the American Medical Association (“AMA”), during the last half century, the U.S. health care system has experienced three separate medical liability crises.² As a result of these crises, there have been numerous efforts to enact medical malpractice tort reform as a means of discouraging non-meritorious lawsuits and excessive awards.
2. Since the mid-1970’s, many scholars, practitioners, and legislative bodies have analyzed the legal and economic consequences of such reforms. Even so, the impact of medical liability tort reform remains both relevant to national and state health care policy and a pressing issue in many areas.
3. The twin goals of most attempts at tort reform have been to improve patients’ access to needed health care and reduce the cost of care. This paper focuses on the first of these goals. It provides empirical evidence of the impact that a cap on non-economic damages awards has had on the supply – and therefore the accessibility – of physicians in the State of Texas.
4. We have analyzed the impact of Texas’ landmark 2003 medical liability tort reforms on state residents’ access to health care.³ We have also assessed the likely effects of a bill, previously before the Texas Legislature, that would have raised the cap on non-economic damages in medical liability cases by tying it to increases in the U. S. Consumer Price Index (“CPI”).⁴
5. Our findings reflect the latest available data on the number of active physicians licensed to practice medicine in Texas. We cite the bases for our conclusions throughout the text of the report and in the accompanying exhibits so that interested parties can replicate and confirm their validity.
6. Before presenting our findings, we provide a brief history of medical liability crises in Texas and the legislative reforms enacted in 2003 to mitigate the most-recent crisis.

² The first crisis was in the 1970s, the second in the 1980s, and the most recent in the early 2000s. See American Medical Association, “Medical Liability Reform NOW!” 2018 edition, p. 7.

³ Two of the authors have conducted similar impact analyses of medical liability tort reforms enacted in California. See, for example, William G. Hamm, Ph.D., H. E. Frech III, Ph.D., and C. Paul Wazzan, Ph.D., “MICRA and Access to Healthcare: By Lowering Healthcare Costs, MICRA Has Improved Californians’ Access to Care,” January 2014.

⁴ See H.B. 719, “A Bill to Be Entitled, An Act Relating to Liability Limits in a Healthcare Liability Claim” (<http://www.legis.state.tx.us/tlodocs/85R/billtext/html/HB00719I.htm>). HB 719 proposed that when there is an increase or decrease in the CPI, the non-economic damages limit set by the 2003 Texas medical liability reform would be adjusted accordingly. The non-economic damages limit would be equal to the current limit (\$250,000) multiplied by 1 plus the percentage increase or decrease in the CPI that measures the average change in the prices of goods and services between September 1, 2003, and the time damages are awarded by judgment or settlement. The bill’s immediate impact would have been to raise the cap by 36.0%, to \$339,899. We calculated this amount based on the text of the proposed bill and the CPI for August 2018. See Exhibit 1 for a detailed explanation of this calculation.

II. Background

A. Initial Efforts to Improve Access to Health Care by Limiting Non-Economic Damages Awards

1. In 1977, during the first medical liability crisis, the Texas Legislature sought to reduce the cost of, and increase access to, health care for Texas residents by passing a series of medical liability reforms that included a cap on non-economic damages awards.⁵

2. Most of those reforms were later invalidated or significantly weakened by the courts. In 1988, for example, the non-economic damages cap was declared unconstitutional. Although the cap on wrongful death awards added by the 1977 legislation was partially upheld, the court ruled that it applied on a per-defendant, rather than a per-plaintiff, basis.⁶ Because of these and other legal developments, the Legislature's reforms had a relatively little impact on the incidence and cost of medical liability litigation – and therefore relatively little impact on the cost of and access to health care.

3. In 1995, the Texas Legislature adopted new reforms that were also intended to reduce the cost of, and increase access to, health care. These reforms included a requirement that plaintiffs in medical liability cases post a bond or provide an expert review of the defendant's actions within 180 days of filing a claim. The pre-suit review requirement, however, was rarely enforced and the 1995 reforms did little to achieve the Legislature's intended purpose of improving access to health care.⁷

4. By the late 1990s, the number of lawsuits and the size of medical liability awards in Texas had increased significantly, despite the absence of any empirical evidence that the quality of care provided by Texas physicians and hospitals had deteriorated. In 2000, an insurance-rate rollback that had been in effect since 1996 was lifted. Together, these developments set the stage for what the AMA and many Texas commentators have called “a health care crisis.”⁸

⁵ “Summary of Texas Medical Professional Liability Law,” Texas Medical Association (<https://www.texmed.org/StatuteOfLimitations/>).

⁶ Michael S. Hull, R. Brent Cooper, Charles W. Bailey, Donald P. Wilcox, Gavin J. Gadberry, and D. Michael Wallach, “House Bill 4 and Proposition 12: An Analysis with Legislative History,” *Texas Tech Law Review*, Volume 36, Supplemental 2005, pp. 4-5.

⁷ *Ibid.*, p. 5.

⁸ See, for examples, James Pinkerton, “Valley doctors caught in ‘lawsuit warzone,’” *Houston Chronicle*, March 4, 2001; Naomi Snyder, “The doctor will not see you now: City is low on neurosurgeons, losing obstetricians” *Corpus Christi Caller-Times*, June 16, 2002; James Pinkerton, “Border-area physicians protest malpractice cost, Frivolous lawsuits causing crisis, doctors

B. The Health Care Crisis in Texas

1. Knowledgeable observers believe that Texas' most-recent medical liability crisis began during the second half of the 1990s and continued until 2003 when the Legislature enacted reforms to the State's medical liability tort system.⁹
2. In 2003, the Legislature found that since 1995, the frequency of health care liability claims had increased at a rate that it deemed to be excessive. The Legislature concluded that the increase in liability claims "...caused a serious public problem in availability of and affordability of adequate medical professional liability insurance."¹⁰
3. In the two years before enactment of the reforms, 14 of the 17 medical liability insurers in Texas left the State or disappeared. In some areas of Texas, there were 3 medical liability suits for every doctor. While some 85% of these cases were unsuccessful, they still cost doctors approximately \$20,000 to \$40,000 per suit to prepare a defense, as well as many hours away from their patients. In addition, doctors were finding it increasingly difficult to afford the medical liability insurance premiums that were rising rapidly as a result of these lawsuits.¹¹
4. Hospitals and nursing homes also experienced substantial increases in their liability insurance costs. The higher costs inhibited their ability to maintain or expand needed health care to the communities they served. Additionally, many institutions experienced severe problems obtaining coverage for certain physician services, particularly in high-risk specialty areas such as obstetrics and emergency care.¹²

contend," *Houston Chronicle*, March 23, 2002; and James Pinkerton," Valley at epicenter of debate on malpractice caps," *Houston Chronicle*, August 30, 2003. It is also worth noting that representatives of the Texas Trial Lawyers Association (TTLA) also expressed concern about the crisis in access to medical care. TTLA representatives offered proposals to address the crisis, in addition to those provided by other interested parties. All sides appeared to agree that access to care was adversely affected by litigation and reform was necessary, but they differed on both the nature of the problem and how to solve it. See *The Medical Malpractice & Tort Reform Act of 2003: Hearings on Texas H.B. 4 Before the Senate State Affairs Committee*, 78th Legislature, R.S. 22-26 (April 16, 2003).

⁹ While enactment of the reforms brought about an immediate change in the outlook for medical liability claims frequency and severity, some of the crisis' effects lingered for a few years until the backlog of pre-reform lawsuits was eliminated and liability insurance premiums began to come down.

¹⁰ Texas H.B. 4, "A Bill to be Entitled an Act Relating to Reform of Certain Procedures and Remedies in Civil Actions," effective September 1, 2003, pp. 85-86.

¹¹ "Ten-Gallon Tort Reform," *Wall Street Journal*, June 6, 2003.

¹² Michael S. Hull, *et al.*, "House Bill 4 and Proposition 12: An Analysis with Legislative History," *Texas Tech Law Review*, Volume 36, Supplemental 2005, p. 3.

5. A hallmark of the crisis was the dramatic increase in the cost to both physicians and hospitals of obtaining medical liability insurance.¹³ In January 2003, the Texas Hospital Association (“THA”) reported that

... the average hospital premium in Texas rose from \$370,000 in 1995 to approximately \$430,000 in 2000. Between 2000 and 2003, the average hospital premium more than doubled, reaching \$870,000 in 2003.¹⁴

6. As insurance premiums increased, many hospitals reported that they were unable to purchase the desired level of insurance, or that the amount of insurance available to them had decreased.¹⁵

7. In the short run, the increases in medical liability premiums were born by health care providers. Because these providers must recover their costs to stay in business, over time the higher premiums tend to increase the cost of care to both patients, workers, and taxpayers.¹⁶

8. The sharp increase in medical liability claims made many doctors unwilling to treat patients with complex or high-risk diagnoses. Patients with a wide range of illnesses and injuries found it increasingly difficult to see a local doctor willing and able to treat their particular medical conditions.¹⁷ Among those disproportionately affected by the medical liability crisis were pregnant women, minors, the elderly, low-income persons, and patients seeking care at hospital emergency rooms.

9. In short, the anecdotal evidence indicated that the medical liability crisis was limiting health care services available to the public – especially residents of the State’s rural areas – and it appeared that even greater shortages in the supply of doctors were on the horizon in the absence of significant medical liability reform.

¹³ See, for example, “Texas Department of Insurance, Medical Malpractice Insurance: Overview and Discussion,” April 22, 2003, p. 6, Table 1.

¹⁴ Texas Hospital Association, “Hospital Professional Liability Study Executive Summary,” 2003, p. 1. See, also, *The Medical Malpractice & Tort Reform Act of 2003: Hearings on Article 10 of Texas H.B. 4 Before the Senate Civil Practices Committee*, 78th Legislature, R.S. 21 (April 16, 2003) (testimony of Matthew T. Wall, Texas Hospital Association).

¹⁵ Texas Hospital Association, “Hospital Professional Liability Study Executive Summary,” 2003, p. 1.

¹⁶ This pattern was not limited to Texas but rather observed throughout the United States. Several insurance carriers left the market altogether (*e.g.*, St. Paul Companies, previously the second largest malpractice carrier in the U.S.), and those that remained often refused to provide new coverage or would do so only for “...physicians with an unblemished claims record.” See Michelle M. Mello, David M. Studdert and Troyen A. Brennan, “The New Medical Malpractice Crisis,” *New England Journal of Medicine* (2003), pp. 2281-2284 at p. 2282.

¹⁷ Rick Perry, “Tort Reform Has Had Just the Impact We Desired,” *Austin American Statesman*, July 17, 2012.

C. The 2003 Reform

1. In 2003, the Texas Legislature acted to end the crisis by enacting a series of tort reforms designed to improve Texans' access to health care. The most important of these reforms was a stacked cap on non-economic damages awards.¹⁸ The cap allows a plaintiff to collect 100% of his or her economic damages plus (a) up to \$250,000 in non-economic, or subjective, damages when one or more physicians and/or nurses are found liable for the patient's injuries; (b) an additional \$250,000 if a health care institution, such as a hospital or nursing home, is also found liable in the same case; and (c) an additional \$250,000 if a second unrelated health care institution is found liable.¹⁹

2. While the stacked cap limits non-economic damages awards, it allows individual plaintiffs to receive significant compensation for these subjective damages – up to \$750,000. No limits were imposed on awards to compensate plaintiffs for their economic damages – present and future medical bills, lost wages, and necessary household services.

3. Before the Legislature enacted the reforms, it considered (a) indexing the cap on non-economic damages to the rate of inflation, and (b) allowing exceptions to the cap. It ultimately rejected both alternatives in favor of the stacked cap, so as to maximize the benefits that it believed Texas residents would derive from the reforms.

4. The reforms took effect on September 1, 2003, but the full impact on Texas' appeal as a place to practice medicine was delayed. When it became evident that the Legislature would act to ameliorate the medical liability crisis, plaintiff lawyers flooded courthouses with lawsuits. During the three months following the law's enactment, but before the law took effect, plaintiff lawyers filed the equivalent of 1.5 years of medical liability lawsuits in many Texas counties.²⁰ The number of pending lawsuits was greater in 2004 than it was in June 2003, when the reforms were signed into law.

¹⁸ Since 2000, 20 states (including Texas) have placed caps on non-economic damages: Nevada (2002), Idaho (2003), Florida (2003), Ohio (2003), Texas (2003), West Virginia (2003), Mississippi (2004), Alaska (2005), Georgia (2005), Illinois (2005), Maryland (2005), South Carolina (2005), Wisconsin (2006), Utah (2010), North Carolina (2011), Oklahoma (2011), Tennessee (2011), Kansas (2014), Missouri (2015), and Iowa (2017). See American Medical Association, "Medical Liability Reform NOW!" 2018 Edition, at pp. 14-19.

¹⁹ Texas H.B. 4, "A Bill to be Entitled an Act Relating to Reform of Certain Procedures and Remedies in Civil Actions," effective September 1, 2003, pp. 59-60, and 86.

²⁰ Stephen P. Magee and Devrim Ikizler, "Physician Per Capita Measurement Error and the 2003 Texas Medical Malpractice Reforms: Supply Effects on Existing Physicians Are Rapid and Larger Than on New Physicians," April 22, 2014, p. 5.

5. The backlog of medical liability lawsuits did not begin to diminish until late 2004.²¹ At this point, new carriers began entering or re-entering the market, and carriers started dropping their insurance rates to reflect the improved outlook for medical liability tort claims.²² In May 2005, the AMA removed Texas from the list of states deemed to be in a medical liability crisis.²³

D. The Legislature’s Objectives in Enacting the Cap on Non-Economic Damages

1. By enacting the 2003 reforms, the Texas Legislature sought to reduce what it deemed to be an excessive number of health care liability claims, and thereby make the tort system less of a deterrent to physicians seeking to practice medicine in the state. The Legislature also intended to decrease the cost of claims and better ensure that claims were more closely related to actual damages, without unnecessarily limiting plaintiffs’ rights.²⁴

2. The reforms were also designed to give physicians and hospitals access to more-affordable medical liability insurance, and thereby make affordable health care more available to Texas residents. In addition, lawmakers hoped to

... reduce malpractice pressure and, as a result, increase the supply of physicians, especially obstetricians and other impacted specialists.²⁵

3. Finally, the reforms were intended (a) to lessen the disincentives for physicians to treat high-risk patients and (b) to discourage the practice of defensive medicine.

III. Analytical Framework and Methodology

A. Analytical Framework

1. Holding income constant, the ability of an individual to obtain needed medical care depends primarily on two factors: (1) the supply of physicians and other health care providers in his or her community; and (2) the cost of care. For those individuals with high-risk diagnoses, such as pregnancy

²¹ *Ibid.*

²² Texas Department of Insurance, *2004 Annual Report*, Part I Report of Program Activities, p. 2 (<http://www.tdi.texas.gov/reports/documents/04annual1.pdf>).

²³ Janet Elliot, “AMA Takes Texas Off Its Liability Crisis List,” *Houston Chronicle*, May 17, 2005 (<http://www.chron.com/news/houston-texas/article/AMA-takes-Texas-off-its-liability-crisis-list-1479518.php>).

²⁴ Texas H.B. 4, “A Bill to be Entitled an Act Relating to Reform of Certain Procedures and Remedies in Civil Actions,” effective September 1, 2001, pp. 86-89.

²⁵ *Ibid.*

complicated by diabetes or high blood pressure, access to needed medical care will depend on a third factor, as well: the willingness of a physician in the community to accept the individual as a patient, and thereby assume the risk of an unfavorable treatment outcome. Such unfavorable treatment outcomes are often followed by a lawsuit claiming that the result was due to medical error.²⁶

2. A state's medical liability tort system can affect all three of these factors, and therefore can have a significant influence on individuals' and families' access to quality health care.

How the Tort System Affects Access to Health Care

3. A state's medical liability tort system affects the supply of health care providers by influencing the state's relative appeal as a place to practice medicine. In states where plaintiffs can obtain unlimited awards at trial for subjective damages, plaintiffs with marginal or non-meritorious claims have a strong economic incentive to allege medical error and file a lawsuit, and their attorneys have considerable leverage in obtaining large settlements from insurance companies for these dubious claims. Not only will such an unfettered system require providers to allocate a greater portion of their revenues to medical liability insurance premiums and the cost of defending themselves in court; it will also cause physicians to spend more time in depositions, trials, and meetings with their counsel, meaning they will have less time available to see patients and practice medicine. It will also make providers more vulnerable to the reputational damage that accompanies a medical liability lawsuit, regardless of whether the suit has merit or is successful.²⁷

4. As a result of what they perceive to be a state's more-hostile tort liability environment, some physicians will choose to withhold their services from state residents. They will do so by (a) rejecting patients with high-risk diagnoses;²⁸ (b) changing the scope of their practices from high-risk specialties (*e.g.*,

²⁶ It is estimated that by age sixty-five, 99% of U.S. physicians in high-risk specialties will have been subject to a malpractice claim. See Anupam B. Jena, Seth Seabury, Darius Lakdawalla and Amitabh Chandra, "Malpractice Risk According to Physician Specialty," *New England Journal of Medicine* (2011), pp. 629-636.

²⁷ For example, a study of 1,406 malpractice claims that involved injury revealed that 37% of these did not involve error. See David M. Studdert, Michelle M. Mello, Atul A. Gawande, Tejal K. Gandhi, Allen Kachalia, Catherine Yoon, Ann Louise Puopolo and Troyen A. Brennan, "Claims, Errors, and Compensation Payments in Medical Malpractice Litigation," *New England Journal of Medicine* (2006), pp. 2024-2033 at p. 2028.

²⁸ For instance, a 2003 (pre-reform) Texas Medical Association survey found obstetricians who elected not to see pregnant patients who previously had a Cesarean section or who had a history of high blood pressure; orthopedic surgeons who chose to stop performing hip and knee replacements for patients with arthritis, or to stop accepting patients with neck or back problems; internists who asked other doctors to see patients with chest pains or complications from diabetes; anesthesiologists who elected to stop treating children; and geriatricians who delayed sending patients with complex problems to a nursing home and instead kept them in a higher-cost hospital longer than otherwise necessary.

obstetrics) to relatively low-risk specialties (*e.g.*, gynecology);²⁹ (c) shifting the location of their practices within the state from low-income or rural areas to higher-income urban areas where it is easier to recoup the cost of higher medical liability insurance premiums from patients; (d) moving their practices to states with a more-benign medical liability system; (e) cutting back the number of hours devoted to seeing patients; or (f) taking early retirement and no longer seeing patients at all. For these same reasons, new doctors will be deterred from establishing their practices or accepting residencies in states with more-permissive tort systems. In each case, the supply of health care providers will go down for state residents and, as a result, access to health care will suffer.

How the Tort System Affects the Cost of Health Care

5. The medical liability tort system also affects the cost of care, both directly and indirectly. The direct effect is obvious: as the tort system encourages more lawsuits, especially non-meritorious lawsuits, the higher cost of awards and settlements will drive up medical liability insurance premiums. The increased costs eventually will be passed along to patients, in the form of larger medical bills, higher health insurance premiums, or both.³⁰

6. Far more important, but less obvious, is the indirect effect of the medical liability tort system on healthcare costs. As health care providers become more vulnerable to lawsuits, they will seek to insulate or better defend themselves from these lawsuits by making greater use of what is commonly known as “defensive medicine.” This term refers to the practice of ordering diagnostic tests or treatments that may not be in the patient’s best interest or may not improve treatment outcomes, but which will make the physician less vulnerable to lawsuits. Defensive medicine drives up the cost of health care to patients, workers, and taxpayers without necessarily improving the quality or results of that care. As health care becomes more expensive, more families will find themselves unable to afford care.³¹

7. There is extensive scholarly literature that reports on attempts to quantify the impact of the medical liability tort system on the practice of defensive medicine. One of the most widely cited of these studies, a

²⁹ See, for example: William F. Rayburn, “The Obstetrician-Gynecologist Workforce in the United States: Facts, Figures and Implications, 2017,” American Congress of Obstetricians and Gynecologists, p. 87 (“In some states, for maternal–fetal medicine specialists, the cost of liability insurance has become prohibitive. Quoted premiums in some states, such as New Jersey, exceeded \$300,000 for a mature policy with a per claim limit of \$1 million and an aggregate of \$3 million. *Specialists in those states no longer attend deliveries and instead confine their practices to consultative services.*” emphasis added).

³⁰ Some of the additional costs will be passed along to taxpayers who fund federal and state health care programs.

³¹ Of 824 physicians who completed a survey in Pennsylvania in 2003, 93% reported practicing defensive medicine. Within this group, “70% reported ordering an unnecessary diagnostic test as their most recent act. The prevalence of assurance behavior, coupled with the unit cost of procedures typically ordered (*e.g.*, MRIs), lends weight to arguments that the total cost of defensive medicine is substantial.” See David M. Studdert, Michelle M. Mello, William M. Sage, “Defensive Medicine Among High-Risk Specialist Physicians in a Volatile Malpractice Environment,” *JAMA* (2005), pp. 2609-2617.

paper authored by Daniel Kessler and Mark McClellan, finds that direct reforms of the tort system – mainly the use of caps to limit awards for non-economic, or subjective damages – are associated with a 4.2% reduction in health care expenditures on elderly patients who have suffered heart attacks.³² Despite this significant reduction in expenditures, however, the study found no increase in adverse medical outcomes.³³ In other words, tort reform was found to reduce the cost of care without harming patients.

8. A recent study by Michael Frakes and Jonathan Gruber reached a similar conclusion. This study finds that immunity to liability is associated with about a 5% reduction in inpatient treatment intensity³⁴ with no decline in health care outcomes. Frakes and Gruber also estimate that states with medical liability caps reduce treatment intensity by roughly 2.1% relative to states without caps. The treatment group used in the Frakes and Gruber study includes active military personnel; thus, these findings are most applicable to active adults who are likely to be healthier than the average American. That said, the Frakes and Gruber study generally reinforces the validity of findings in the earlier Kessler and McClellan study, which used a much different patient population.³⁵

9. The reduction in total health care expenditures resulting from non-economic damages caps may be more or less than 4.2% for diagnoses other than heart attacks. To put the magnitude of the potential savings from caps in context, we note that 4.2% of Texas' health care spending in 2015 amounted to more than \$1.8 billion.³⁶

10. In this report, we focus primarily on the impact of Texas' 2003 medical liability reforms on the *supply of physicians and other health care providers*, and their willingness to treat high-risk patients. We will analyze the reforms' effect on the *cost of care* in a subsequent report.

B. Methodology

1. Most scholars who have studied the effects of the medical liability tort system on physician behavior appear to agree that, other things being equal, an increase in the vulnerability of health care providers to

³² Daniel P. Kessler and Mark B. McClellan, "Medical Liability, Managed Care, and Defensive Medicine," National Bureau of Economic Research Working Paper 7537 (February 2000), pp. 16 and 29.

³³ *Ibid.*

³⁴ Treatment intensity includes total inpatient days, the number of procedures performed, and a Department of Defense derived intensity metric known as Relative Weighted Product which is designed to be comparable across direct and purchased care settings.

³⁵ Michael D. Frakes and Jonathan Gruber, "Defensive Medicine: Evidence from Military Immunity," National Bureau of Economic Research Working Paper 24846 (July 2018).

³⁶ Total health care expenditures in Texas for 2015 were \$42.9 billion. See Texas Comptroller of Public Accounts, *Texas Health Care Spending Report Fiscal 2015*, p. 2 (<https://comptroller.texas.gov/economy/docs/96-1796.pdf>).

lawsuits will reduce the supply of physician services. This agreement is fully in accord with well-established principles of economics. The disagreement among scholars relates to the relative importance of the tort system in influencing the supply of physicians.³⁷

2. The purpose of our analysis is to determine whether and by how much the 2003 Texas medical liability reforms increased the supply of physicians in Texas and therefore improved access to health care for families and individuals. To accomplish this objective, we compare the average change in the per capita supply of physicians during the Crisis Period with the corresponding rate of change after the reforms took effect.

3. We define the “Crisis Period” as the years 1997 to 2002. We selected 1997 as the beginning of the Crisis Period, even though there is evidence that the so-called crisis began earlier in the 1990s, for reasons of data availability. We were not able to obtain reliable, comparable data on the number of active, practicing physicians in Texas for years prior to 1997.

4. We selected 2002 as the end of the “Crisis Period” because medical liability tort reform was enacted in 2003 and was on the Texas Legislature’s agenda throughout most of the year.

5. As discussed below, however, the data strongly suggest that the 2003 reforms took longer to affect physician perceptions and behavior in rural areas. For this reason, we compare the pre-reform and post-reform per capita growth rates in the number of physicians in rural areas using 1997-2003 as the pre-reform period.

6. To measure the effect of the 2003 reforms on the supply of physicians, we compare the average annual rates of growth in the number of active, licensed physicians before and after the reforms, relative to the change in the state’s population. It is necessary to relate the change in supply to the change in population (that is, make the comparison on a per capita basis) because the principles of economics hold that other things being equal, an increase in demand for health care stemming from a growing population will call forth an increase in the supply of health care providers. If the rate of growth in the number of active physicians per capita increased after the reforms took effect, it provides *prima facie* evidence that the reforms were effective in achieving the Legislature’s intended purpose of improving access to health care for Texas residents. If, however, the rate of growth in the number of active physicians per capita did not increase or went down after the reforms took effect, it would provide *prima facie* evidence that the reforms

³⁷ See, e.g., Jonathan Klick and Thomas Stratmann, “Medical Malpractice Reform and Physicians in High-Risk Specialties,” *Journal of Legal Studies*, Vol. 36 (2007), pp. 121-142; and William E. Encinosa and Fred J. Hellinger, “Have State Caps on Malpractice Awards Increased the Supply of Physicians?” *Health Affairs* (2005), pp. W5-250-W5-258.

did not achieve the Legislature’s purpose because other factors more than offset the reforms’ expected positive effect on supply.

7. We readily acknowledge that factors other than liability risk affected the locational decisions of health care providers, both before and after the 2003 reforms were enacted. For example, Texas’ economy generally out-performed the U.S. economy during both periods, making the state relatively more attractive as a place to live and practice medicine. Also, the growth of academic medical centers in Austin and other Texas cities may have attracted physicians to the state independently of medical liability reforms.

8. Other factors unrelated to liability risk tended to discourage physicians from setting-up their practices in Texas. These factors include the State’s highest-in-the-nation uninsured rate³⁸ and its extremely low Medicaid payment rates.³⁹

9. In our opinion, these other factors, by themselves, cannot explain the results from the data analyses reported below. Some of these other factors, such as the relatively stronger performance of the Texas economy, were present in both the pre- and post-reform periods. Other factors are, themselves, strengthened or weakened by liability risk. For example, research-oriented physicians who wish to continue providing patient care on a part-time basis will be more likely to locate or relocate to an academic medical center in, say, Austin, rather than in Minneapolis or Baltimore, to the extent that the 2003 reforms reduce health care providers’ vulnerability to non-meritorious medical liability lawsuits. Even with these qualifications, it is impossible to rule out the possibility that the results from our data analysis overstate the effect of the 2003 reforms on physician supply.

10. It is also possible, and we believe more likely, that our results *understate* the reforms’ impact. As demonstrated later in this report, by reducing physicians’ vulnerability to non-meritorious lawsuits, the reforms increased the willingness of physicians to treat patients with high-risk or complex diagnoses – a benefit of reform that is not captured by statistics on the number of physicians per capita. Nor would these statistics capture an increase in the hours worked by physicians because of their reduced vulnerability to non-meritorious lawsuits.

³⁸Jessica C. Barnett and Edward R. Berchick, “Health insurance coverage in the United States: 2016,” United States Census Bureau, September 12, 2017 (Report Number P60-260), Table 6. (https://www.census.gov/library/publications/2017/demo/p60-260.html?e=gd&utm_medium=email&utm_source=govdelivery).

³⁹Federal Register, Volume 80, No. 227, Wednesday, November 25, 2015 Notices, pages 73779-73782, Department of Health and Human Services: Table 1. Federal Medical Assistance Percentages and enhanced Federal Medical Assistance Percentages, Effective October 1, 2016 through September 30, 2017 (Fiscal Year 2017).

11. In short, we believe the results of our analysis provide a meaningful and reliable measure of the 2003 reforms' impact on the supply of active physicians in Texas, although the size of the impact may be somewhat larger or smaller than what our data show it to be.

C. Data

1. To assess the effects of the 2003 reforms on the number of physicians in Texas, we analyzed data from the Texas Medical Board ("TMB"), as well as data from the Texas Department of Insurance ("TDI"), the Texas Medical Association ("TMA"), and the THA. We also relied upon publicly available sources from the relevant time periods to help us interpret the data in an appropriate context.

2. The TMB provided us with Excel files that contained data for the years 2002-2017 regarding the number of active physicians in Texas, as well as their practice address, specialty, age, whether they were engaged in direct patient care, type of practice, gender, and race.⁴⁰ To create a data set that would allow us to calculate per capita growth rates during the Crisis Period, we used PDF files maintained on the TMB website for the years 1997-2001. The final data set that we analyzed for the purposes of this study thus includes data for all active physicians licensed in the State of Texas during the years 1997-2017.⁴¹

3. Some researchers⁴² believe the TMB data are inferior to data on direct patient care physicians compiled by the Texas Department of State Health Services ("TDSHS"),⁴³ for two reasons. First, they point out that the TMB data does not exclude administrators, researchers, and other categories of physicians that may not be fully engaged in patient care. Second, they claim that the behavior of doctors who do not

⁴⁰ The TMB is the statutory body that regulates the practice of medicine in Texas. It collects and maintains detailed data concerning physician demographics, status of practice, location, complaints, compliance, litigation, and enforcement.

⁴¹ In 2010, the TMB modified how "active but not in practice" physicians were classified by including those physicians with a "Practice Time Code" of "N/A." Because we were unable to extend this modification to the TMB's PDF files, we excluded "active but not in practice" physicians based only on the TMB's original classification (*i.e.*, "Registration Status Code" of "Active Not Practicing") for all years. We were not able to determine whether the percent of total licensed physicians categorized as "active but not in practice" under the new classification was materially different in the pre-and post-reform periods, but we believe this percent to be immaterial.

⁴² See, for example, David A. Hyman, Charles Silver, Bernard Black, & Myungho Paik, "Does Tort Reform Affect Physician Supply? Evidence from Texas," *International Review of Law and Economics*, 42 (2015) 203–218 (henceforth, "Hyman, *et al.*").

⁴³ The TDSHS data set is derived from the TMB data and includes "all active and non-federal Physicians (Medical Doctors and Doctors of Osteopathy) practicing in Texas. Residents and fellows, teachers, administrators, researchers, federal, military, retired and "not in practice" Physicians are excluded from the supply totals. Locum Tenens physicians are also excluded." See, Texas Department of State Health Services, Center for Health Statistics, Health Professions Resource Center, County Supply and Distribution Tables – Physicians (Direct Patient Care) (<https://www.dshs.texas.gov/chs/hprc/DPC-1nk.shtm>).

themselves pay medical liability insurance premiums (*e.g.*, medical school faculty and doctors employed by the Department of Veterans Affairs) is not likely to be influenced by tort reform.

4. We considered using, but did not chose to use, the TDSHS data for several reasons. First, the TDSHS data omits a sizable number of practitioners who provide direct patient care – particularly to sub-categories of patients who are under-served for reasons of income or location. These practitioners include medical school faculty and researchers who also see patients.

5. Second, the exclusion of doctors who do not themselves pay medical liability insurance premiums (*e.g.*, medical school faculty and doctors employed by the Department of Veterans Affairs) is improper and will tend to understate the positive effects of tort reform. The claim that these physicians are not likely to be influenced by a cap on non-economic damages overlooks a key benefit from tort reform, as perceived by doctors themselves. While high medical liability insurance premiums do, indeed, deter some physicians from locating their practices in states lacking effective caps on non-economic damages awards, an even greater deterrent is the prospect of being unjustly sued and the reputational damage and lost-time costs that go with such lawsuits. Even physicians who do not appear to benefit directly from lower medical liability insurance premiums⁴⁴ are likely to find post-reform Texas a more attractive place to practice medicine. An increase in the number of such providers caused by the 2003 reforms would not be picked-up by the TDSHS data.

6. Third, in attempting to replicate the TDSHS data using the TMB data (from which the TDSHS data was compiled), we discovered several anomalies that cause the results derived from this data to be questionable.⁴⁵

⁴⁴ Even non-payers benefit financially from a reduction in the cost of the medical liability tort system because more of their total compensation will be paid to them as salaries and benefits, rather than redirected to insurance companies or self-insurance reserve accounts.

⁴⁵ For example, the identification of residents and fellows was not consistent throughout the period. Identification of residents and fellows increased significantly from 2002 through 2004. During this period, a large number of physicians were reclassified as residents or fellows from direct patient care in the prior year. In addition, teachers, administrators, and researchers were tracked inconsistently throughout the period. According to TDSHS, “Due to changes in the methodology of the file preparation, Researchers and Faculty were counted (for the first time in 2008) if they also indicated Direct Medical/Patient Care” (<http://www.dshs.texas.gov/chs/hprc/DPC-lnk.shtm?terms=direct%20patient>). Leading up to this transition, the identification of medical teaching and medical school faculty physicians nearly doubled suggesting additional changes in this classification process. Furthermore, this transition corresponded with additional setting codes that had not been previously utilized. Additionally, there are irregularities in the number of military physicians where the percent of physicians identified in this category shifted dramatically from year to year.

7. In sum, while the TMB data may have some limitations, as do all data sets, its coverage and availability make it a reasonable and valid choice for analyzing the impact of the 2003 reforms on the supply of physicians in Texas.

IV. The Impact of the 2003 Reforms on Access to Health Care

1. In general, we find that the data validate the realization of the Texas Legislature's expectations when it enacted HB 4 in 2003, as well as the claims made on the law's behalf in various news reports. Indeed, the limits on non-economic damages have led to a significant increase in the number of active physicians per capita in the State, thereby increasing Texas residents' access to needed health care.

A. Licensing

1. The influx of new doctors following the reforms was so large that it overwhelmed the TMB.⁴⁶ In 2007, the Board reported that it had licensed 10,878 physicians since 2003, up from 8,391 in the preceding four-year period (a 30% increase). In fact, the TMB issued 980 medical licenses at its meeting in August 2007, a record number that raised the count of doctors in Texas to 44,752. Even with the unprecedented rate of approvals, there remained a backlog of nearly 2,500 physician applications awaiting processing.⁴⁷

2. The TMB reported in 2012 that it had licensed a record 3,630 new physicians. It attributed the increase in the rate at which new physicians were licensed to the reforms passed in 2003.⁴⁸

3. To the extent that new licensees were offset by doctors allowing their licenses to lapse, there would be no improvement in Texans' access to health care. Hence, we must look at how the total number of active, licensed physicians changed, relative to the change in population, both before and after the reforms took effect.

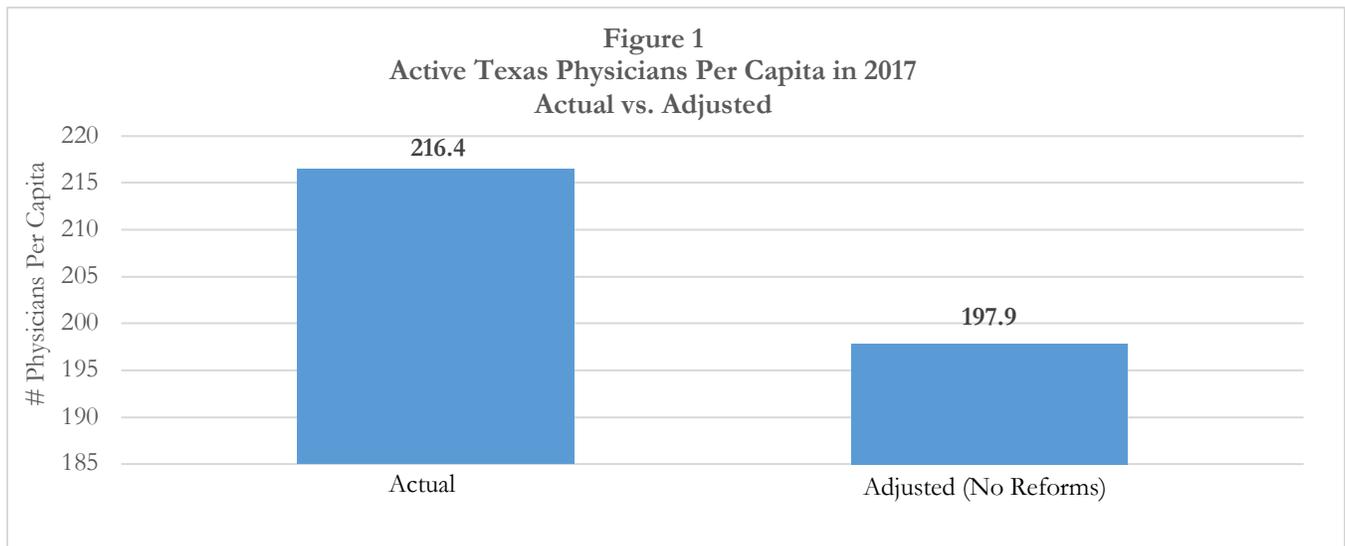
⁴⁶ See, for example, "Influx of Doctors Overwhelms Texas Board," *The New York Times*, July 9, 2007.

⁴⁷ Ralph Blumenthal, "More Doctors in Texas After Malpractice Caps," *The New York Times*, October 5, 2007.

⁴⁸ "Healthy Signs: Record Number of New Docs is Good News for East Texas," *Longview News-Journal*, September 25, 2012. See, also, Ronald M. Stewart, Molly West, Richard Schirmer, and Kenneth R. Sirinek, "Tort Reform Is Associated with Significant Increases in Texas Physicians Relative to the Texas Population," *Journal of Gastrointestinal Surgery*, Vol. 16, No. 10 (October 2012), pp. 1-11.

B. Rate of Increase in the Number of Active Physicians Per Capita

1. Access to health care in Texas, as measured by the number of active physicians per capita, improved significantly after the passage of the 2003 reforms. During the Crisis Period (1997-2002), the number of active physicians per capita increased at an average annual rate of 0.90%. Since the reforms took effect, the growth rate has increased by two thirds, to 1.5%.⁴⁹
2. Exhibits 2 and 3 show the average year-over-year change in the number of in-state active physicians in Texas during and after the Crisis Period. The data presented in Exhibit 2 show that the number of active physicians in Texas increased by 61% between 2003 and 2017. If, instead, the per capita number of these physicians had continued to grow at the rate observed during the Crisis Period, the increase in the number of physicians would have been only 47.2%.⁵⁰ Thus, the data suggest that by 2017, the reforms had increased the number of active physicians serving Texas residents by 13.8 percentage points.⁵¹
3. Figure 1 compares the actual number of active physicians per capita in 2017 with what the ratio would have been if the number had grown at the Crisis Period rate.



⁴⁹ This pattern is not limited to this time period or location. For example, a 2005 study based on data from 1985-2000 for all 50 states reached a similar conclusion. Specifically, when comparing the 27 states that implemented caps on non-economic damages to those states without a cap, counties in states with a cap had 2.2% more physicians per capita, and rural counties had 3.2% more physicians per capita. See William E. Encinosa and Fred J. Hellinger, “Have State Caps on Malpractice Awards Increased the Supply of Physicians?” *Health Affairs* (2005), pp. W5-250-W5-258 at p. W5-250.

⁵⁰ This is our estimate of physician population growth in Texas if the 2003 reforms had not occurred (the “# of Adjusted Active Physicians”). This calculation is explained in detail on Exhibit 2.

⁵¹ Our conclusion differs from the conclusion reached by Hyman *et al.* The difference may be explained by their decision to use the TDSHS dataset, despite its shortcomings. It may also be because Hyman *et al.* do not compare the post-reform period to the Crisis Period, but rather use 1980-2002 as the base period, thereby diluting the effects of the crisis on physician supply.

NOTE: The adjusted number of active physicians per capita assumes that the per capita number would have continued to grow at the Crisis Period (1997-2002) average annual rate.

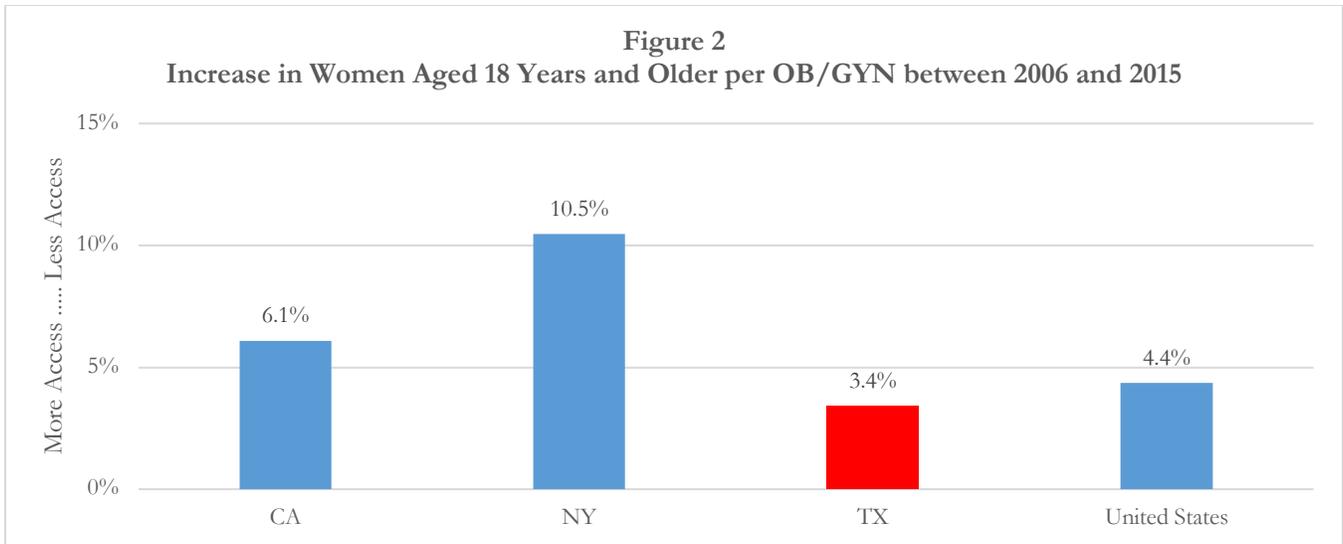
C. Medical Specialties

1. Our analysis of the 2003 reform's impact on the number of active physicians in various medical specialties is presented in Exhibit 4. Our findings are summarized in the following paragraphs.
2. Cardiology: The number of active cardiologists per capita increased by 35% between 2003 and 2017. The average annual per capita change for this specialty during the post-Crisis Period (2.2%) was more than double the corresponding rate during the Crisis Period (0.9%).
3. Obstetrics-Gynecology: In contrast, the per capita number of active OB/GYN specialists grew by only 2.3% between 2003 and 2017. A comparison of the Crisis Period and post-Crisis Period average annual per capita growth rates shows that the rate was higher in the earlier period (0.3% versus 0.2%). We believe, however, it would be a mistake to interpret this slow-down in the per capita growth rate as evidence that the reforms have not had a favorable impact on Texan's access to OB/GYN physicians. In fact, other data indicate that since 2006 Texas has added more OB/GYNs than any other state, including more-populous California.⁵²
4. Texas' success in attracting OB/GYN specialists can be reconciled with the decline in the per capita growth rate when we take nationwide trends into account. During the post-Crisis Period, the total number of new OB/GYN specialists in the United States as a whole has failed to keep pace with the growing number of women of childbearing-age. As a result, the average state has seen the number of childbearing-age women per OB/GYN specialist go up.⁵³ As Figure 2 shows, although Texas has not bucked this nationwide trend, it has fared significantly better than most other states in attracting and retaining OB/GYNs.⁵⁴

⁵² William F. Rayburn, "The Obstetrician-Gynecologist Workforce in the United States: Facts, Figures and Implications, 2017," American Congress of Obstetricians and Gynecologists, Table 2. Interstate Relocation Patterns of Obstetrician-Gynecologists Between 2006 and 2015, pp. 17-18. Some 1,826 new obstetricians were added nationally, with 21.4% of them going to Texas. Texas added 390, California added 265, and New York (a state without caps) lost 141 OB/GYNs.

⁵³ *Ibid.*

⁵⁴ William F. Rayburn, "The Obstetrician-Gynecologist Workforce in the United States: Facts, Figures and Implications, 2017," American Congress of Obstetricians and Gynecologists, Table 2. Interstate Relocation Patterns of Obstetrician-Gynecologists Between 2006 and 2015, pp. 17-18.



5. While the childbearing-age-women-to-OB/GYN ratio has increased by 4.37% for the U.S. as a whole (and by 10.48% in New York, where there is no cap on non-economic damages awards), in Texas it has increased by only 3.42%, or 22% less than the national average.⁵⁵ Clearly, the 2003 reforms have helped Texas compete more effectively for a relatively small pool of OB/GYNs.

6. Emergency Medicine: Among the eight specialties we looked at, the emergency medicine specialty experienced the most significant percentage growth after the 2003 reforms. During the 2003-2017 period, the number of active emergency medicine physicians increased by 128.5%. Thus, for every 100,000 persons in Texas, there were an additional 8 emergency medicine physicians in the post-Crisis Period. The average annual rate of per capita growth in the number of physicians for this specialty during the post-reform period (6.1%) was two-thirds higher than the corresponding rate during the Crisis Period (3.7%).

7. Anesthesiology: The per capita number of active anesthesiologists saw a 25.2% increase between 2003 and 2017. The average annual per capita growth rate in the post-Crisis Period was one and a half times the Crisis Period rate (1.6% vs. 0.6%).

8. Neurosurgery: The number of active physicians in the neurosurgery specialty increased on a per capita basis by 16.1% between 2003 and 2017. During the Crisis Period, the average annual per capita growth rate grew slightly at 0.5%, while the rate following enactment of the reforms more than doubled, to 1.1%.

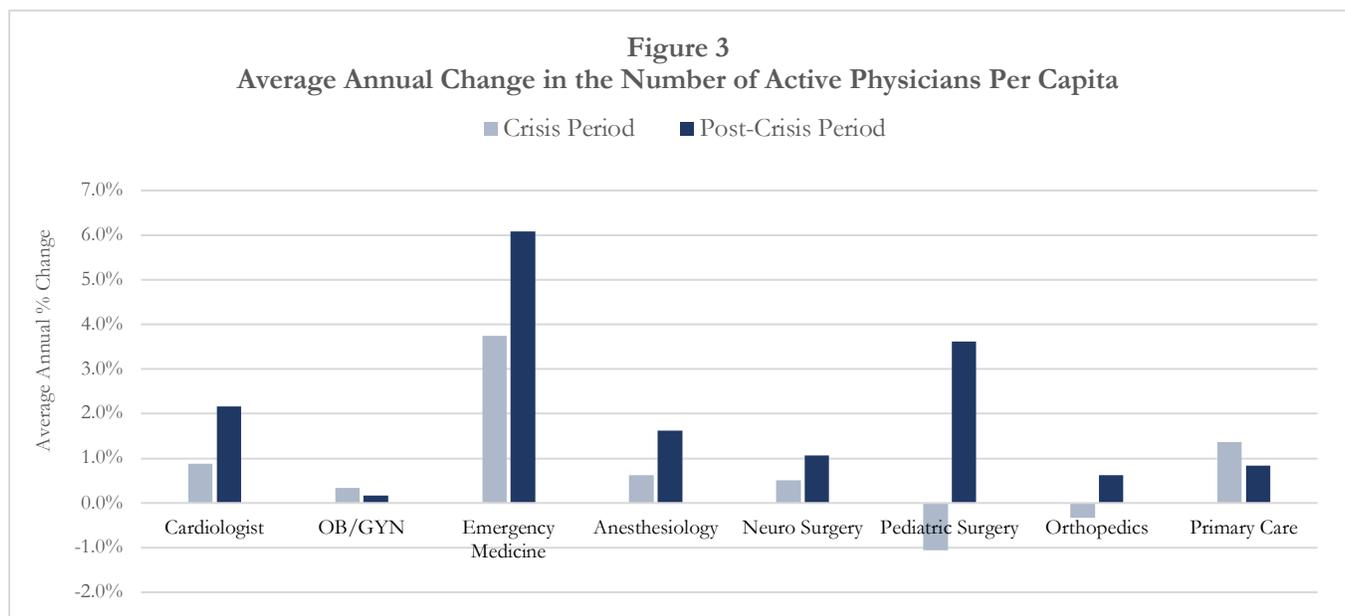
⁵⁵ *Ibid.*

9. **Pediatric Surgery:** The number of active physicians in the pediatric specialty increased on a per capita basis by 64.6% between 2003 and 2017. During the Crisis Period, the number of such physicians actually declined relative to the State’s population -1.1%. Since the cap took effect, however, the per capita growth rate of pediatric surgeons has averaged 3.6% annually.

10. **Orthopedics:** The number of active orthopedists per capita also *declined* during the five years ending in 2002 (average annual rate of change: -0.3%, but then increased 9.1% following the 2003 reforms (average annual growth rate: 0.6%.

11. **Primary Care:** Between 2003 and 2017, the number of active primary care physicians per capita increased by 12.3%. The average annual per capita growth rate for this specialty during the Crisis Period (1.4%), however, exceeded the post-Crisis Period growth rate (0.8%).

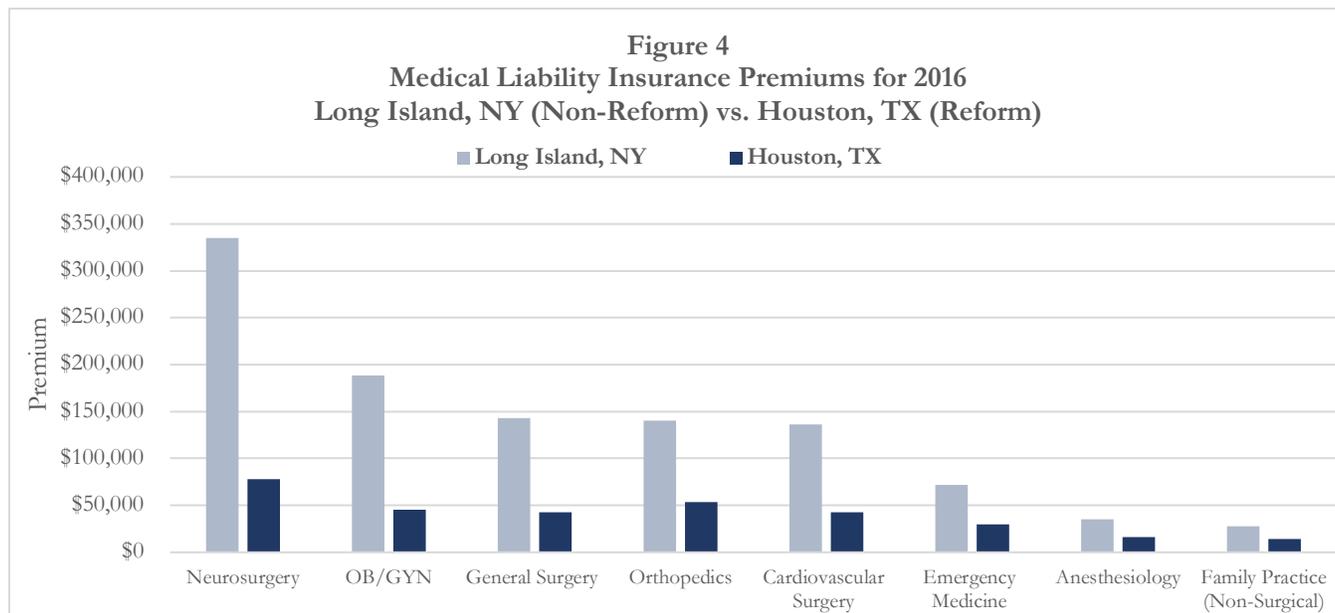
12. **Re-cap.** Figure 3 displays the trends described above. It shows that following the 2003 reforms, the annual rate of increase in the per capita supply of active doctors in Texas either accelerated or went from negative to positive for six of the eight specialties analyzed.



13. Figure 4 shows the relative vulnerability of these six specialties to medical liability lawsuits.⁵⁶ Specifically, it shows the average medical liability insurance premium for specialists on Long Island, NY and in Houston, TX. A comparison of Figure 3 and Figure 4 shows that except for OB/GYN, the most-vulnerable specialties all showed improvement in the number of practitioners relative to the State’s

⁵⁶ Data provided by The Doctors Company.

population after the 2003 reforms took effect— Cardiology, Neurosurgery, Pediatric Surgery, and Orthopedics – are among the four most vulnerable to medical liability lawsuits, and therefore pay the highest medical liability insurance premiums. These are the specialty areas we would expect to derive the most benefit from the 2003 reforms.⁵⁷



14. Two of the eight specialties analyzed did not show an increase in the per capita growth rate after the 2003 reforms – Primary Care and OB/GYN. It is not surprising that Primary Care did not show an increase. It is the specialty that is *least* vulnerable to medical liability lawsuits, and therefore least likely to benefit from tort reform. In contrast, OB/GYN is one of the specialties that are most vulnerable to medical liability lawsuits.⁵⁸ As explained above, however, the failure of this specialty’s per capita growth rate to accelerate after the reforms took effect is explained by nationwide trends, which almost certainly obscured the favorable effect of the reforms on the supply of OB/GYN specialists. Indeed, Texas added more OB/GYNs during the 2006-2015 period than any other state in the nation.

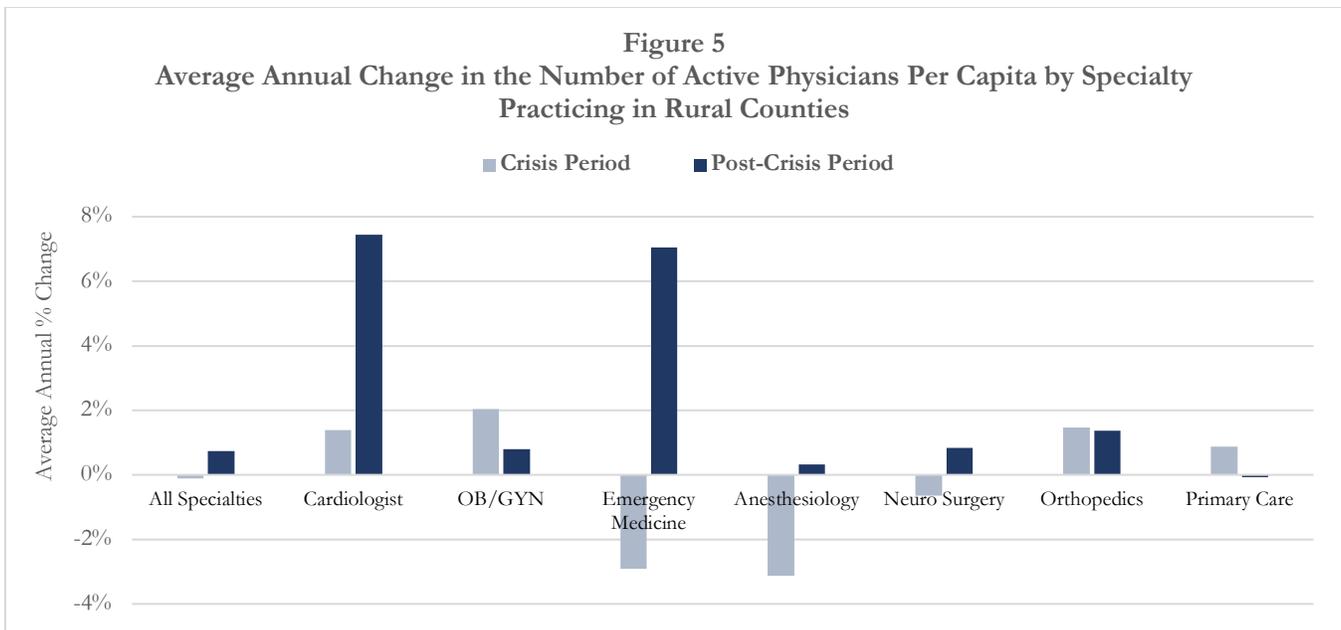
⁵⁷ See, e.g., Jonathan Klick and Thomas Stratmann, “Medical Malpractice Reform and Physicians in High-Risk Specialties,” *Journal of Legal Studies*, Vol. 36 (2007), pp. 121-142.

⁵⁸ To illustrate, based on a similar study using 1985-2000 data for all 50 states, rural counties in states with a cap *above* \$250,000 had 5.4% less OB/GYN specialists than those with a cap at \$250,000. See William E. Encinosa and Fred J. Hellinger, “Have State Caps on Malpractice Awards Increased the Supply of Physicians?” *Health Affairs* (2005), pp. W5-250-W5-258 at p. W5-250.

D. Licensed Physicians in Rural Areas

1. Exhibits 5 and 6 further analyze the data on medical specialists and considers active physicians working in rural areas of Texas, where widespread access to health care – particularly to certain types of specialists – has historically been more difficult.
2. When 2002 is used as the end-date for the Crisis Period, the results of the data analysis are mixed. The average annual growth rate in the per capita number of active, rural-based Cardiologists, Emergency Medical Physicians, and Neurosurgeons was significantly greater in the post-Crisis Period than in the Crisis Period. Other specialties, such as OB/GYN, Anesthesiology, Orthopedics, and Primary Care showed no improvement following the reforms.
3. In analyzing the TMB data, however, we noted that in 2003, the number of active physicians per capita in rural areas declined or remained unchanged for every one of the eight specialties. In contrast, the number of active physicians per capita in *non*-rural areas increased in 2003 for each of these specialties. This suggests that the benefits from medical liability reform took longer to reach rural areas, due to the relatively greater difficulties involved in establishing a successful practice in these areas, and as a result, rural areas were still experiencing the effects of the medical liability crisis in 2003.⁵⁹ When we re-defined the crisis period for rural areas to include 2003, we find that the results are fully consistent with the statewide results: the average rate of increase in the number of active physicians per capita was higher in the post-reform period for all specialties except OB/GYN, Orthopedics, and Primary Care. As we noted earlier, (1) the Primary Care specialty is among the least vulnerable to medical liability lawsuits, and would therefore be expected to show the least benefits from medical liability reform, and (2) the post-reform slow rate of growth in active OB/GYN physicians is consistent with – but markedly better than – the nationwide trend, and almost certainly masks the favorable impact of the reforms on this specialty.
4. Figure 5 shows the pre- and post-reform rates of change for each specialty when 2003 is used to mark the end of the crisis period.

⁵⁹ See, e.g., Thomas C. Rosenthal and Chester Fox, “Access to Health Care for the Rural Elderly,” *JAMA* (2000), pp. 2034-2036.



E. Access to Physician Services in Predominantly Minority Areas

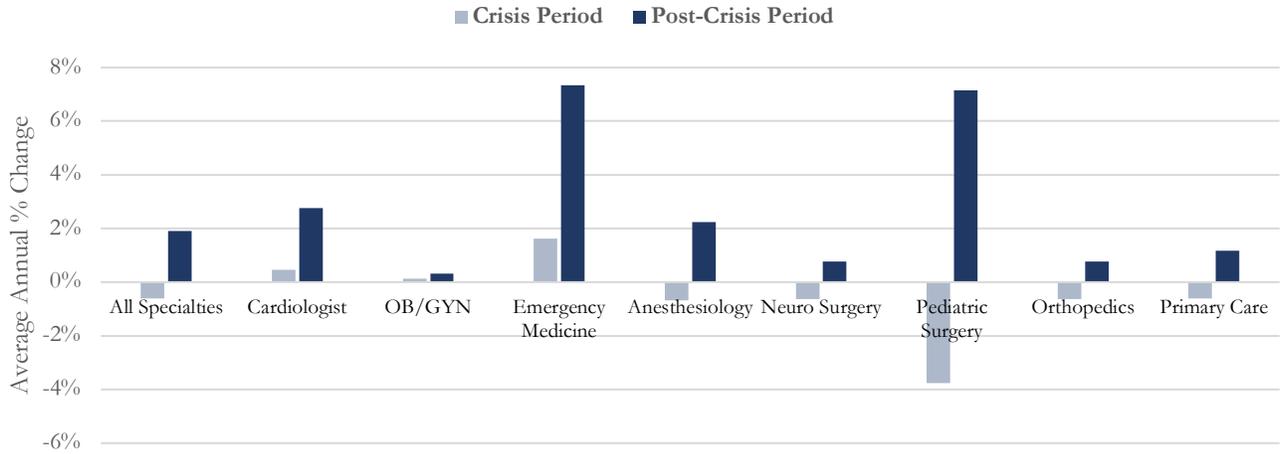
1. We also analyzed the data on active physicians by medical specialty serving predominantly minority communities, where widespread access to health care has historically been more difficult. About 41% of Texas’ population identifies as being Hispanic.⁶⁰ Schedule B of this report identifies 33 counties with the highest concentration of Hispanics, accounting for about 19% of Texas’ total population.⁶¹ As shown in Exhibits 7 and 8, collectively, the per capita number of active physicians declined in these counties during the Crisis Period and then increased 30.2% in the post-Crisis Period. The average annual per capita growth rate for active physicians in these counties also increased in the post-Crisis Period for all high-risk specialties, with the largest improvements occurring in Cardiology, Emergency Medicine and Anesthesiology.

2. Figure 6 shows that during the Crisis Period, five out of the eight specialties had a negative average annual per capita growth rate. Following the 2003 reforms, the annual rate of increase in the per capita supply of active doctors in the 33 predominantly Hispanic counties turned positive or accelerated for all specialties analyzed.

⁶⁰ Texas Health and Human Services, Center for Health Statistics, Texas Population, 2017 (<https://www.dshs.texas.gov/chs/popdat/ST2017.shtm>).

⁶¹ Appendix B of this report identifies the counties with Hispanics composing 50% or greater of the county’s population from 1997 to 2017.

Figure 6
Average Annual Change in the Number of Active Physicians Per Capita by Specialty in Predominantly Hispanic Counties



3. About 11% of Texas’ population identifies as being African-American,⁶² with the highest concentration of the African-American population residing in urban communities. This makes it more difficult to isolate the effects of the reforms on the supply of active physicians serving the African-American community. We identified 11 counties that had a African-American population of 20% or more, representing about 2% of Texas’ total population. Although the results are fairly consistent with the results we see for Texas as a whole, the sample size of the population analyzed is not sufficiently robust to establish that the effects of the reforms on the African-American community were as positive as they were for the Hispanic community.

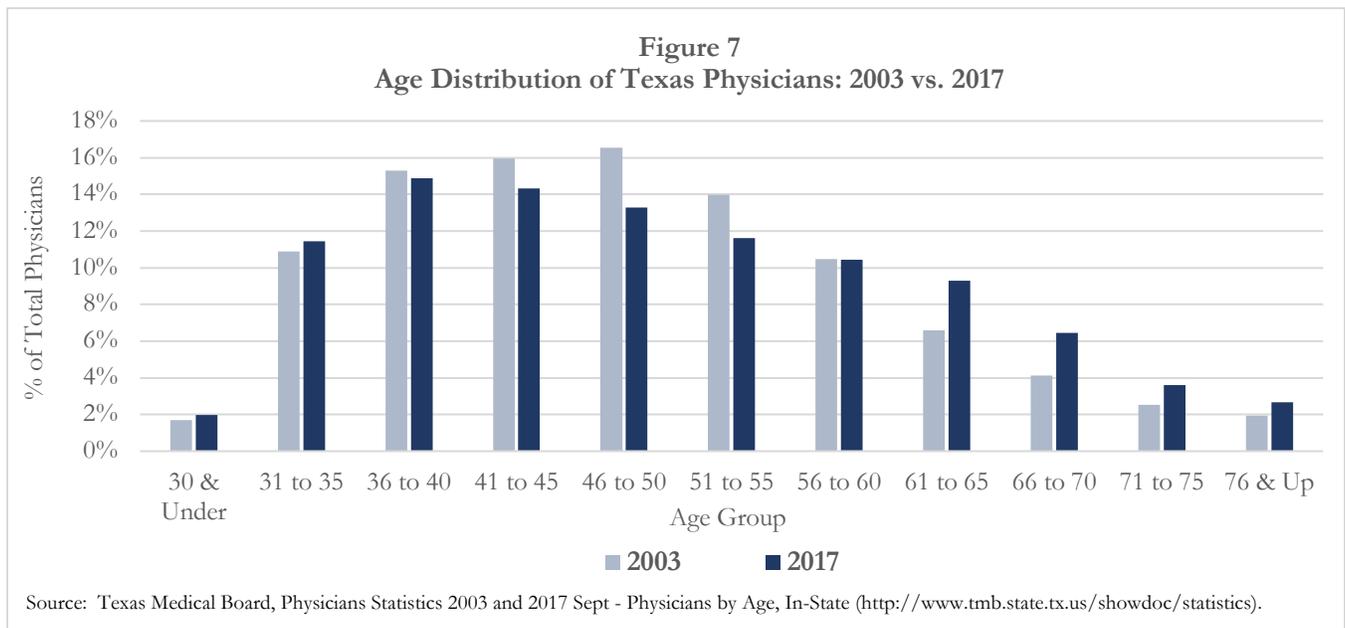
F. Experience of Licensed Physicians in Texas

1. The TMB maintains data on the age of licensed physicians in Texas. As Figure 6 illustrates, these data show that between 2003 and 2017, there was a shift in the age distribution toward older physicians (over the age of 55). This may mean that the 2003 reforms induced some physicians to delay their retirement and continue practicing medicine.⁶³ To the extent this occurred, the reforms have given Texas

⁶² Texas Health and Human Services, Center for Health Statistics, Texas Population, 2017 (<https://www.dshs.texas.gov/chs/popdat/ST2017.shtm>).

⁶³ Prior to Florida’s 2003 reform, 759 survey responses were gathered from rural physicians. Based on these responses, 13.7% indicated that they would be leaving their practice within the coming two years. Of these physicians, 16.3% specified early retirement as the reason for leaving, while 44.2% attributed their planned departure to “practice issues.” See Robert G. Brooks, Nir Menachemi, Cathy Hughes and Art Clawson, “Impact of the Medical Professional Liability Insurance Crisis on Access to Care in Florida,” *Arch Intern Med.*, Vol. 164 (2004), pp. 2217-2222 at p. 2220.

residents greater access to more-experienced physicians and enabled more Texans to continue seeing doctors with whom they have established a satisfactory long-term relationship.

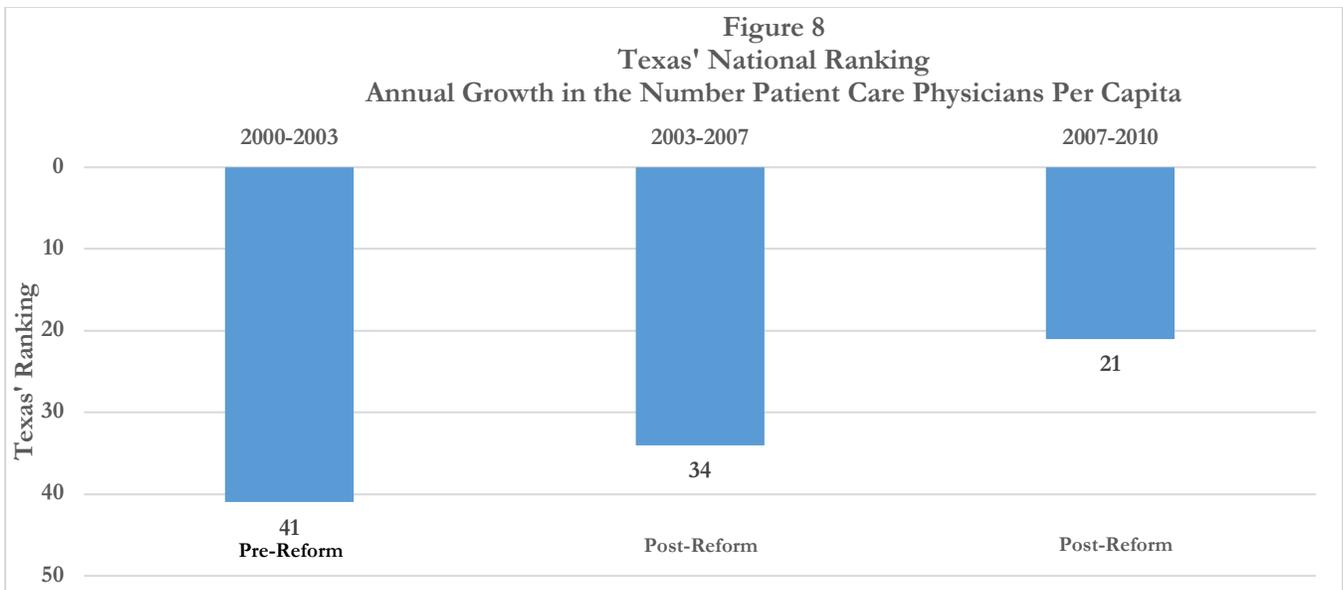


G. Texas’ National Ranking

1. The AMA ranked Texas 44th in the nation in terms of the number patient care physicians per capita for 2003⁶⁴ and 41st in the nation in annual growth in the number of patient care physicians per capita for the period 2000-2003. This ranking shows that during the Crisis Period, Texas had one of the slowest annual growth in the number of physicians per capita. After the 2003 reform, Texas’ rank (as calculated by annual growth in patient care physicians per capita) rose to 34th for the 2003-2007 period, and then to 21st for the 2007-2010 period.⁶⁵ (These rankings cover all 50 states plus the District of Columbia).

⁶⁴ Physician Characteristics and Distribution in the US, *Dept. of Physicians Practice and Communications Information, Division of Survey and Data Resources, American Medical Association*, 2005.

⁶⁵ Physician Characteristics and Distribution in the US, *Dept. of Physicians Practice and Communications Information, Division of Survey and Data Resources, American Medical Association* 2000, 2003, 2007, and 2010 Editions.



2. By 2017, Texas’s appeal to physicians had improved to such an extent that Physicians Practice, a practice management firm, ranked the State second best in the nation as a place to practice medicine.⁶⁶

H. Texas’ Success in Retaining Medical Students

1. In 2014, Texas retained approximately 60% of the physicians who had completed an in-state undergraduate medical education program. Texas’ retention rate ranked second highest in the nation, bested only by California – a state with a lower cap on non-economic damages than Texas.⁶⁷ That same year, Texas retained 80.6% of physicians who completed both their undergraduate and graduate medical education in the State – the third highest retention rate in the U.S.⁶⁸

⁶⁶ Physicians Practice, “2017 Best States to Practice: The Top Five” (<http://www.physicianspractice.com/best-states-practice/2017-best-states-practice-top-five>).

⁶⁷ Association of American Medical Colleges, “2015 State Physician Workforce Data Book,” November 2015 ([https://members.aamc.org/eweb/upload/2015StateDataBook%20\(revised\).pdf](https://members.aamc.org/eweb/upload/2015StateDataBook%20(revised).pdf)). See Figures 4.1 and 4.2, and Tables 4.1 and 4.2.

⁶⁸ Association of American Medical Colleges, “2015 State Physician Workforce Data Book,” November 2015 ([https://members.aamc.org/eweb/upload/2015StateDataBook%20\(revised\).pdf](https://members.aamc.org/eweb/upload/2015StateDataBook%20(revised).pdf)). See Figure 4.4 and Table 4.4.

I. Willingness of Physicians to Treat High-Risk Patients

1. In the aftermath of the reforms, Texas physicians were far more willing to treat complex or high-risk cases than they were during the Crisis Period.⁶⁹

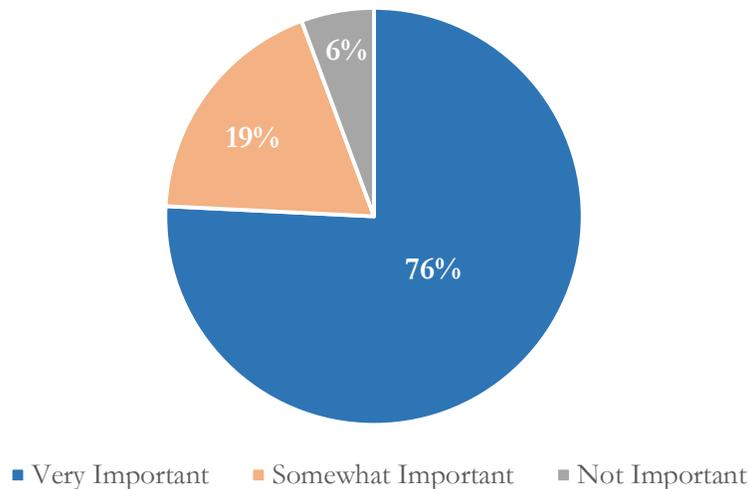
2. The Texas Medical Association conducted surveys of physician attitudes in 2003, 2004, 2006, 2008, and 2010 (see Exhibit 9). Among other questions, physicians were asked:

In the past two years, have you begun denying or referring complex or high-risk cases?

Since September 1, 2003, have you begun denying or referring complex or high-risk cases?

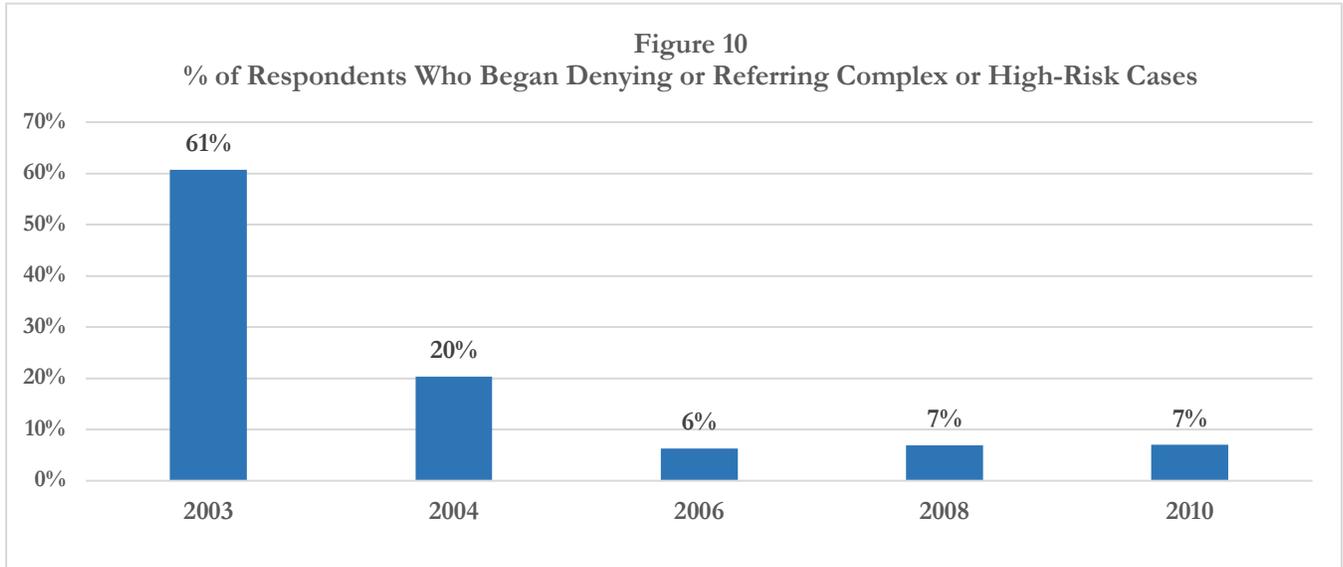
3. Of the 1,108 respondents to the 2003 survey, 60.7% reported that in the last two years of the Crisis Period, they had begun refusing to treat or referring complex or high-risk cases. As Figure 9 shows, 95% of these respondents said “professional liability pressures” were either a “very important” (76%) or a “somewhat important” (19%) factor accounting for their actions.

Figure 9
Importance of Professional Liability Pressures in Explaining Physicians' Decision to Begin Denying or Referring Complex or High-Risk Cases (2003)



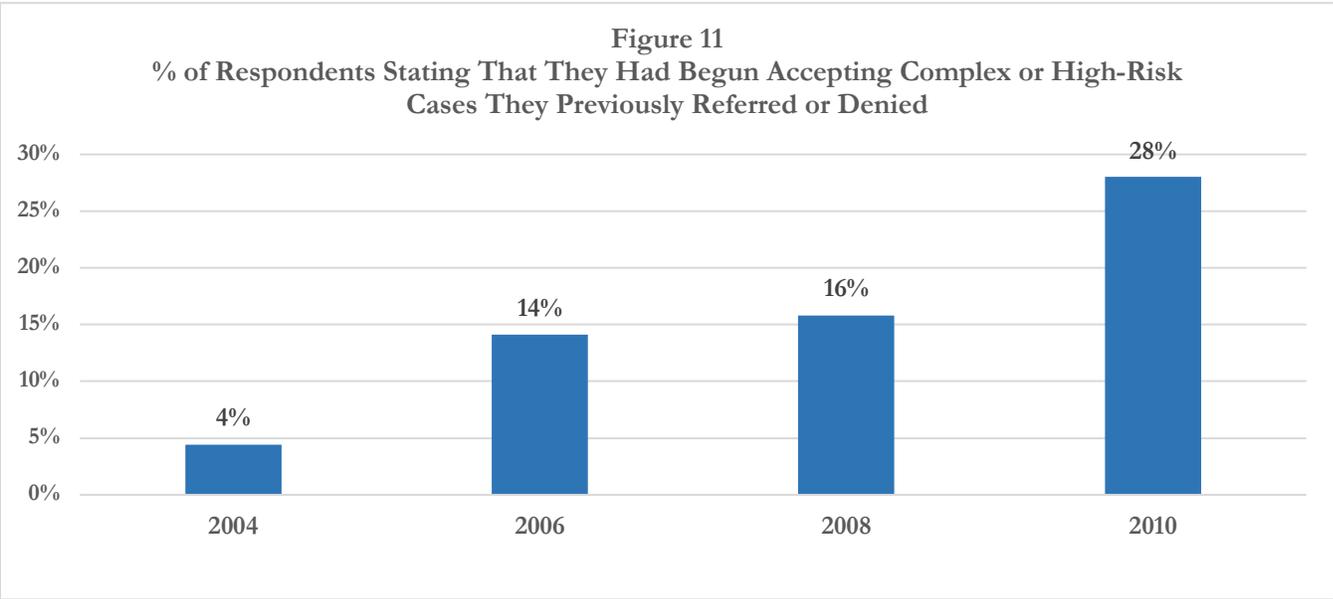
⁶⁹ A 2005 study revealed a stark trend in the number of physicians performing high-risk procedures in Florida in the years leading up to the states' reform in late 2003. The number of physicians performing brain operations *increased* by 11.8% between 1997 and 2000 but *decreased* by 6.2% between 2000 and 2003. Similarly, the number of physicians performing high-risk deliveries *increased* by 4.6% between 1997 and 2000 but *decreased* by 2.6% between 2000 and 2003. See David Dranove and Anne Gron, “Effects of the Malpractice Crisis on Access to and Incidence of High-Risk Procedures: Evidence from Florida,” *Health Affairs*, Vol. 24, No. 3 (2005), pp. 802-810 at pp. 804-805.

4. After the cap took effect, the share of respondents that began refusing to treat or refer complex or high-risk cases dropped to 20% in 2004, and to 7% in 2010. These results are shown in Figure 10.

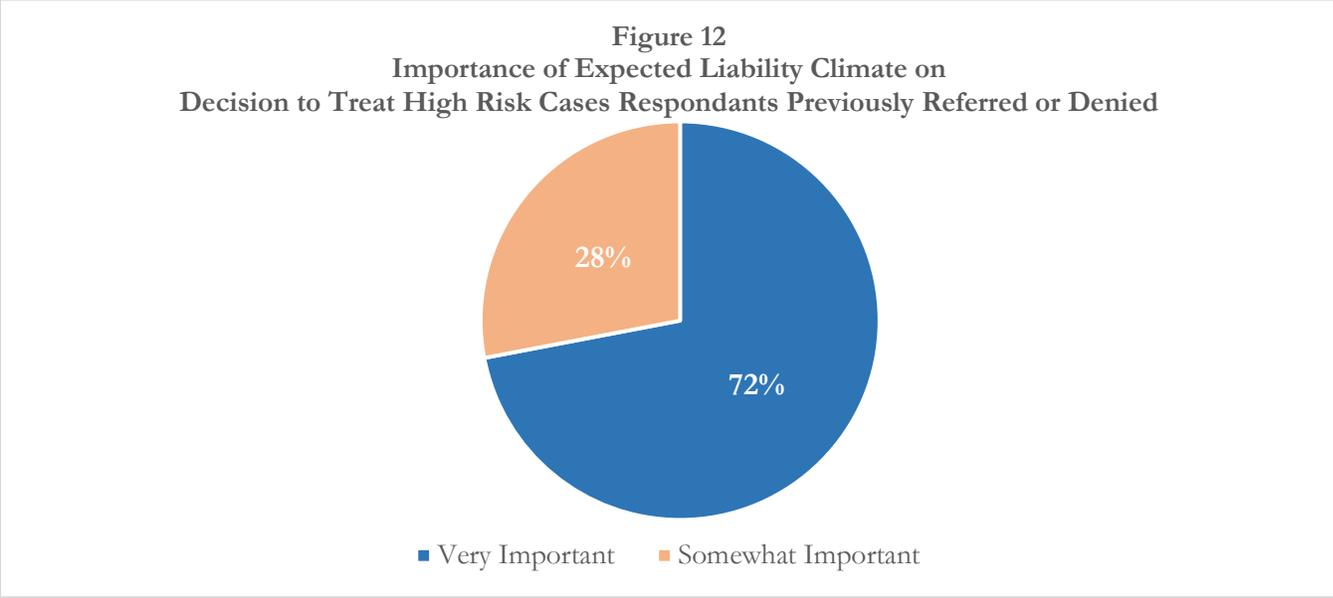


5. Following the establishment of the cap in 2003, physicians were asked if they had “[b]egun accepting complex or high-risk cases . . . [they] previously referred or denied.”⁷⁰ As Figure 11 shows, the percent of respondents who answered “yes” rose from 4% in 2004 to 28% in 2010.

⁷⁰ Texas Medical Association Liability Surveys, 2004, 2006, 2008, and 2010.



6. All of the 2010 respondents stated that “the perceived or expected [medical] liability climate” was either a “very important” (72%) or “somewhat important” (28%) reason for the change in their willingness to treat such patients.⁷¹



⁷¹ Texas Medical Association Liability Survey, 2010.

J. Reduction in Hospital Liability Costs

1. Five years after the reforms were implemented, Texas hospitals were experiencing major reductions in medical liability costs, and they were reinvesting at least some of their savings in programs intended to benefit patients.
2. A survey conducted by the THA found that by 2008, hospital professional liability insurance premiums had dropped significantly from pre-reform levels. The 109 hospitals that provided premium information for THA's survey reported a total decrease in annual hospital liability premiums of more than \$100 million since 2003. In some cases, the saving occurred at the same time coverage limits doubled or tripled.⁷²
3. The THA survey also found that 85% of hospitals were finding it easier to recruit specialists, and 69% of hospitals were maintaining or expanding services as a result of the costs-savings associated with the medical liability reforms. More than half of the hospitals reported using the liability insurance cost-savings to expand safety programs, and more than half of them reported using their savings to maintain or expand services for patients who were uninsured or underinsured. Similarly, 46% of hospitals reported using all or part of the savings to subsidize shortfalls from various government programs, such as Medicaid.⁷³

K. Charity Care

1. We also analyzed data from the THA to assess the effects of the 2003 reform on charity care in Texas counties. The results are presented in Exhibits 10 and 11. Of the 183 counties that responded to THA queries, 76% stated that they had increased charity care between 2003 and 2014. The average increase per hospital was more than \$15 million. These results suggest that a significant portion of the cost saving associated with the 2003 reforms went towards assisting patients who were underinsured and/or uninsured, giving these patients greater access to needed medical services.

⁷² Texas Hospital Association, "Texas Hospitals Reinvesting Savings from Medical Liability Reform: THA Survey Shows Patients Benefit from More Specialists, Expanded Services," Press Release, September 10, 2008.

⁷³ *Ibid.* See, also, "Texas Hospitals Reinvesting Savings from Medical Liability Reform: THA Survey Shows Patients Benefit from More Specialists, Expanded Services," September 10, 2008 (<http://www.texashospitalsonline.org/>).

L. Conclusion

1. In sum, the available data show that the 2003 medical liability tort reforms achieved the Legislature's intended effects of improving access to health care for Texas residents.⁷⁴ The reforms provided Texans with greater access to physicians, particularly physicians in four of the five specialties most vulnerable to medical liability lawsuits. The reforms also significantly increased the likelihood that Texas residents with high-risk diagnoses can find a qualified specialist who is willing to treat them.

2. The 2003 tort reforms also improved access to health care for Texas' Hispanic residents (and probably for African-American residents as well, although the data is not sufficiently robust to establish this conclusion definitively). The reforms provided Hispanic residents with greater access to physicians, including all high-risk specialties.

3. These benefits have not come at the expense of patients with meritorious medical liability claims. According to the Texas Department of Insurance's closed claims data, the average payout in high-dollar (*i.e.*, greater than \$250,000) lawsuits is \$877,796 (2012), demonstrating that plaintiffs with serious injuries are still able to obtain large compensatory awards.⁷⁵

V. Likely Consequences of Raising the Cap on Non-Economic Damages

1. A bill introduced in the Texas Legislature during the 2017 Session – HB 719, if approved, would have raised the cap on subjective, non-economic damages by 36%, from \$250,000 to \$339,899. The bill also would have provided for further increases in the cap over time.

2. The data available from the TMB do not allow us to quantify the likely impact that the higher cap would have on access to needed health care by Texas residents. The comparison of the Crisis Period and post-Crisis Period trends in the supply of physicians presented in this paper,

⁷⁴ It should be noted that tort reform, in general, is not a precursor to a better-functioning healthcare market. Rather, the *type* of reform must be carefully considered. For example, a study of the U.S. healthcare crisis of the 1980s found that collateral source rule reform, prejudgment interest reform, joint and several liability reforms, and caps on punitive damages (which "limits payments to punish a defendant for intentional or malicious misconduct") had no effect on the supply of physicians. See William E. Encinosa and Fred J. Hellinger, "Have State Caps on Malpractice Awards Increased the Supply of Physicians?" *Health Affairs* (2005), pp. W5-250-W5-258 at pp. W5-255-256.

⁷⁵ Texas Department of Insurance, 2012 Closed Claim Survey (<https://www.tdi.texas.gov/reports/report4.html>)

however, provide us with a sound basis for characterizing the likely impact with a high degree of confidence.

3. The starting point for predicting the likely impact of a higher cap on access to health care in Texas is the environment that prevailed for Texas medical care providers immediately before the HB 4 cap was imposed in 2003. As documented in Part II of this report, key features of this environment included:

- The withdrawal of 82% of medical liability insurers from the Texas market;
- Excessive rates of litigation against physicians, with up to three medical liability lawsuits filed per doctor in some areas;
- A high rate of non-meritorious lawsuits – 85% of the total – brought against physicians, saddling them with heavy reputational and financial costs and reducing their opportunities to treat patients in need of care;
- Rapidly rising medical liability insurance premiums for those physicians and hospitals fortunate enough to obtain insurance from private carriers;
- A widespread unwillingness on the part of specialists to treat patients with complex or high-risk diagnoses; and
- Declining numbers of active physicians per capita in certain key specialty areas, such as cardiology, OB/GYN, anesthesiology, neurosurgery, and orthopedics, as well as in primary care.

4. As the data cited in this report demonstrates, these unfavorable trends were reversed following the adoption of the HB 4 cap that limited awards for subjective damages to \$250,000 for physicians. Following H.B. 4's effective date:

- Medical liability insurers began returning to the Texas market: after declining from 17 to 4 between 2001 and 2003, the number of medical liability carriers writing insurance in Texas increased to 30 by May 2007;
- Lawsuits – especially non-meritorious lawsuits – targeting physicians declined by nearly 50 percent from the inflated levels reported for the Crisis Period;

- Medical liability insurance premiums fell sharply, and insurance became more accessible to physicians and hospitals and, therefore, to sick and injured patients with valid medical liability claims;
- Physicians became significantly more willing to treat patients with complex or high-risk diagnosis;
- Access to needed health care increased in Hispanic areas, across all specialties including high-risk specialties.
- The numbers of active physicians per capita statewide, as well as in most key specialty areas, improved relative to crisis-period trends; and
- Hospitals used part of their savings on medical liability insurance to increase charity care for low-income patients.

5. This before-and-after comparison provides compelling evidence that an increase in the cap on awards for subjective (non-economic) damages is likely to slow or reverse the post-reform gains in the number of physicians per capita, and thereby diminish access to medical care for residents of Texas.

6. The immediate effect of an increase in the cap such as HB 719 proposed would be to encourage more lawsuits against physicians and hospitals, particularly non-meritorious suits – the type of suit that caps are most effective in discouraging. As the number of lawsuits increases and physicians become more vulnerable to the financial, reputational, and practice-related costs that accompany such suits, physicians will once again begin restricting the services they provide to high-risk patients, shift away from high-risk specialties, and move to areas (including other states) that are less litigious or offer other economic advantages.⁷⁶

7. Patients with high-risk conditions, minorities such as African-Americans and Hispanics, patients residing in rural areas, the uninsured, and the working poor would be disproportionately

⁷⁶ Multiple studies have found that, relative to a cap on malpractice damage awards, reforms that *indirectly* affect the amount of damages (e.g., periodic payments or abolishment of the common rule of joint and several liability) are less effective in lowering the costs of defensive medicine and insurance premiums. See Frank A. Sloan, Paula M. Mergenhausen and Randall R. Bovbjerg, “Effects of Tort Reforms on the Value of Closed Medical Malpractice Claims: A Microanalysis,” *Journal of Health Politics, Policy and Law*, Vol. 14, No. 4 (1989), pp. 663-689; D.P. Kessler and M.B. McClellan, “How Liability Law Affects Medical Productivity,” *Journal of Health Economics*, Vol. 21, No. 6 (2002), pp. 931-955; and Kenneth E. Thorpe, “The Medical Malpractice ‘Crisis’: Recent Trends and the Impact of State Tort Reforms,” *Health Affairs* (2004), pp. W4-20-W4-30.

affected by the reductions in the supply of health care resources brought about by the higher cap. An increase in liability risk resulting from the higher cap would reduce the willingness of doctors to treat high-risk patients, since – by definition – the possibility of an unfavorable outcome in these cases, even when the best medical care is provided, is high. For example, we would expect to see a reduction in the number of obstetricians, with fewer doctors delivering babies and more obstetricians restricting their practice to gynecology only. A withdrawal or contraction of medical resources available to high-risk patients is what occurred in the run-up to the 2003 reforms, and it is all-but-certain to happen again if the cap is raised.

8. Similarly, Texas' experience during the Crisis Period indicates that the supply of health care resources is at greater risk in rural areas, where the ability to pass on the increased costs of medical liability insurance is more limited than it is in more-affluent areas. Rural areas are impacted more severely by increased premiums because rural physicians cover many more parts of health care than urban physicians. Almost all of them have a clinical practice, a hospital inpatient practice, and practice in the ER. Urban family practice physicians typically work in a single medical area.⁷⁷ As a result, increases in liability insurance costs have a greater impact on rural physicians. As it did during the 1997-2003 Crisis Period, a higher ceiling on non-economic damage awards will cause more physicians to relocate their practices from rural areas in Texas to higher-income areas within the State, or to other states. It is much more difficult to replace a rural physician that leaves the area because the pool of prospects is much smaller than it is for urban physicians. Practicing in isolated, small towns, where you don't have the resources and referral sources that you do in an urban area, appeals to fewer physicians.

9. Finally, an increase in the cap on non-economic damages would reduce the ability of community hospitals, clinics, and health centers to serve lower income families. These providers operate on thin margins and tight budgets. In the short run, an increase in medical liability insurance costs would have to be offset by budget cuts in other areas of their operations, such as by cutting service hours for patients, reducing the medical staff, or reducing the breadth of services offered by a given facility. Thus, raising the cap on non-economic damages will likely reduce charitable care to these families as well or require rural governmental hospitals to raise taxes in order to replace funds used for increased liability costs.

⁷⁷ Per Brian Jackson, General Counsel to the Texas Hospital Insurance Exchange.

10. In general, increasing the caps would make Texas a less-attractive state in which to practice medicine, and thus result in fewer physicians establishing or maintaining a practice within the State. This will bring about a reduction in access to needed medical care for Texas residents.

Rural Counties in Texas

1. The following counties were used in our analysis of changes in physician supply in rural counties. These counties were identified by the Texas Health and Human Resources as “Rural” as of 2013.⁷⁸

Rural Counties

Anderson	Delta	Hockley	Mason	Shackelford
Andrews	DeWitt	Hopkins	Matagorda	Shelby
Angelina	Dickens	Houston	Maverick	Sherman
Bailey	Dimmit	Howard	Menard	Starr
Baylor	Donley	Hutchinson	Milam	Stephens
Bee	Duval	Jack	Mills	Sterling
Blanco	Eastland	Jackson	Mitchell	Stonewall
Borden	Edwards	Jasper	Montague	Sutton
Bosque	Erath	Jeff Davis	Moore	Swisher
Brewster	Fannin	Jim Hogg	Morris	Terrell
Briscoe	Fayette	Jim Wells	Motley	Terry
Brooks	Fisher	Karnes	Nacogdoches	Throckmorton
Brown	Floyd	Kenedy	Navarro	Titus
Burnet	Foard	Kent	Nolan	Trinity
Calhoun	Franklin	Kerr	Ochiltree	Tyler
Camp	Freestone	Kimble	Palo Pinto	Upton
Cass	Frio	King	Panola	Uvalde
Castro	Gaines	Kinney	Parmer	Val Verde
Cherokee	Garza	Kleberg	Pecos	Van Zandt
Childress	Gillespie	Knox	Polk	Walker
Cochran	Glasscock	Lamar	Presidio	Ward
Coke	Gonzales	Lamb	Rains	Washington
Coleman	Gray	La Salle	Reagan	Wharton
Collingsworth	Grimes	Lavaca	Real	Wheeler
Colorado	Hale	Lee	Red River	Wilbarger
Comanche	Hall	Leon	Reeves	Willacy
Concho	Hamilton	Limestone	Refugio	Winkler
Cooke	Hansford	Lipscomb	Roberts	Wood
Cottle	Hardeman	Live Oak	Runnels	Yoakum
Crane	Harrison	Llano	Sabine	Young
Crockett	Hartley	Loving	San Augustine	Zapata
Culberson	Haskell	McCulloch	San Jacinto	Zavala
Dallam	Hemphill	McMullen	San Saba	
Dawson	Henderson	Madison	Schleicher	
Deaf Smith	Hill	Marion	Scurry	

⁷⁸ Texas Department of State Health Services, Definitions of County Designations (<https://www.dshs.texas.gov/chs/hprc/counties.shtm>).

Predominantly Hispanic Counties in Texas

1. The following counties were used in our analysis of changes in physician supply in predominantly Hispanic counties (population composition of 50% and above) each year from 1997 to 2017.⁷⁹

Hispanic Counties

Atascosa	El Paso	Nueces
Bee	Frio	Pecos
Bexar	Hidalgo	Presidio
Brooks	Hudspeth	Reeves
Cameron	Jim Hogg	Starr
Castro	Jim Wells	Uvalde
Crockett	Kenedy	Val Verde
Culberson	Kinney	Webb
Deaf Smith	Kleberg	Willacy
Dimmit	La Salle	Zapata
Duval	Maverick	Zavala

⁷⁹ Texas Department of State Health Services, Texas Population Downloads (<https://www.dshs.texas.gov/chs/popdat/downloads.shtm>).