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# "Sorry" Is Never Enough: How State Apology Laws Fail to Reduce Medical Malpractice Liability Risk

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## ARTICLE

# **“Sorry” Is Never Enough: How State Apology Laws Fail to Reduce Medical Malpractice Liability Risk**

Benjamin J. McMichael, R. Lawrence Van Horn & W. Kip Viscusi\*

**Abstract.** Based on case studies indicating that apologies from physicians to patients can promote healing, understanding, and dispute resolution, thirty-nine states (and the District of Columbia) have sought to reduce litigation and medical malpractice liability by enacting apology laws. Apology laws facilitate apologies by making them inadmissible as evidence in subsequent malpractice trials.

The underlying assumption of these laws is that after receiving an apology, patients will be less likely to pursue malpractice claims and will be more likely to settle claims that are filed. However, once a patient has been made aware that the physician has committed a medical error, the patient's incentive to pursue a claim may increase even though the apology itself cannot be introduced as evidence. Thus, apology laws could lead to either increases or decreases in overall medical malpractice liability risk. Despite apology laws' status as one of the most widespread tort reforms in the country, there is little evidence that they achieve their goal of reducing litigation.

This Article provides critical new evidence on the role of apology laws by examining a dataset of malpractice claims obtained directly from a large national malpractice insurer. This dataset includes substantially more information than is publicly available, and thus presents a unique opportunity to understand the effect of apology laws on the entire litigation landscape in ways that are not possible using only publicly available data. Decomposing medical malpractice liability risk into the frequency of claims and the magnitude of those claims, we examine the malpractice claims against 90% of physicians in the country who practice within a particular specialty over an eight-year period.

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The analysis demonstrates that for physicians who regularly perform surgery—a context in which patients are more likely to be aware of potential risks—apology laws do not have a substantial effect on the probability that a physician will face a claim or the average payment made to resolve a claim. For nonsurgeons, we find that apology laws increase the probability of facing a lawsuit and increase the average payment made to resolve a claim, a finding which is consistent with the presence of asymmetric information. Overall, our findings indicate that on balance, apology laws increase rather than limit medical malpractice liability risk.

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## Introduction

"Sorry" is a ubiquitous part of everyday life. An apology may follow a bump in the hallway, a forgotten document, tardiness, or any of hundreds of other trivial transgressions. Despite the prevalence of apologies, however, they have historically been largely absent from disputes severe enough to necessitate involving the legal system. Defense attorneys, fearing that an apology may be used at trial as evidence of liability, often counsel their clients to avoid apologizing.<sup>1</sup> But according to psychological and legal research, this dearth of apologies has negative consequences for both plaintiffs and defendants. For plaintiffs, apologies have the power to restore dignity, assuage anger, and heal humiliations following a transgression by the defendant, and these benefits can be particularly important following an injury severe enough to generate a lawsuit.<sup>2</sup> Defendants, too, may benefit from apologies, as some evidence suggests that following an apology, injured parties may be more likely to accept lower settlement offers and to resolve disputes quickly.<sup>3</sup>

While plaintiffs clearly benefit from apologies, defendants face something of a paradox. On one hand, apologizing may place them at an increased risk of liability,<sup>4</sup> as the apology itself may be evidence of fault and bolster plaintiffs' resolve to pursue claims. On the other hand, apologizing may assuage the injured parties and either forestall any legal claim or, if a claim is filed, facilitate settlement.<sup>5</sup> Recognizing this conundrum, state lawmakers have taken action to

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1. See Jennifer K. Robbennolt, *Apologies and Legal Settlement: An Empirical Examination*, 102 MICH. L. REV. 460, 467 (2003) ("[A]ttorneys and others fear that any apology will be admitted into evidence as an admission of fault. Consequently, some clients are hesitant to apologize. Likewise, lawyers and insurance companies may be unlikely to advise their clients to apologize or to make any statement that could be construed as an apology. In fact, they may actively discourage such statements." (footnote omitted)).
  2. See AARON LAZARE, ON APOLOGY 1 (2004) ("Apologies have the power to heal humiliations and grudges, remove the desire for vengeance, and generate forgiveness on the part of the offended parties."); Susan Daicoff, *Apology, Forgiveness, Reconciliation & Therapeutic Jurisprudence*, 13 PEPP. DISP. RESOL. L.J. 131, 143 (2013) ("Apology, forgiveness, and reconciliation can have great benefits by reducing . . . negative emotions and improving the potential for individual reform. Thus, they can maximize the therapeutic aspects of legal matters and minimize the anti-therapeutic ones for wrongdoers and affected persons alike."); Ken-ichi Ohbuchi et al., *Apology as Aggression Control: Its Role in Mediating Appraisal of and Response to Harm*, 56 J. PERSONALITY & SOC. PSYCHOL. 219, 221-22 (1989).
  3. See Jennifer K. Robbennolt, *Apologies and Settlement Levers*, 3 J. EMPIRICAL LEGAL STUD. 333, 367-69 (2006).
  4. See *id.* at 334 (noting the "concern that apologies will be viewed as admissions of responsibility and, consequently, will result in increased liability," and that "[d]efendants may wish to offer apologies in some cases, but fear that an apology will be used against them in court").
  5. See *id.* at 334-35 ("Proponents of apologies hope that, at least in some cases, a party's offer of an apology may eliminate the need for a lawsuit or may at least facilitate settlement of the dispute.").

facilitate more apologies by passing "apology laws." These laws reduce the risk of apologizing for defendants by making statements of apology, sympathy, and condolence inadmissible in any subsequent trial,<sup>6</sup> thereby encouraging defendants to apologize more often. Though apologies can generate benefits for both plaintiffs and defendants, state lawmakers have been very clear that in passing these laws, they seek "to reduce lawsuits and encourage settlements"<sup>7</sup> based on the "underlying theory . . . that a settlement of a lawsuit is more likely if the defendant is free to express sympathy for the plaintiff's injuries without making a statement that would be admissible as an admission of a party opponent."<sup>8</sup>

Apology laws bear a striking resemblance to tort reforms. The status of apology laws as tort reforms has been the subject of some debate, but in function—if not in form<sup>9</sup>—these laws constitute a new generation of tort reform. Apology laws, like other, more familiar tort reforms, are designed to reduce litigation and decrease the pressure exerted on defendants by the threat of legal liability. Moreover, as in the case of other tort reforms, many apology laws are specifically limited to one area that has traditionally been the focus of efforts to reduce litigation—medical malpractice.<sup>10</sup> Indeed, Yonathan Arbel and Yotam Kaplan have recently concluded that "despite appearances, apology laws *are* de-facto tort reform."<sup>11</sup> Tracing the development of apology laws, Arbel and Kaplan explain that "tort reformers have . . . co-opt[ed] the rhetoric and discourse on apologies and the law—independently developed by ethicists, dispute resolution specialists, and legal theorists," and have thereby "found a path into the

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6. See, e.g., FLA. STAT. § 90.4026(2) (2018) ("The portion of statements, writings, or benevolent gestures expressing sympathy or a general sense of benevolence relating to the pain, suffering, or death of a person involved in an accident and made to that person or to the family of that person shall be inadmissible as evidence in a civil action.").

7. See, e.g., CAL. EVID. CODE § 1160 cmt. (West 2018).

8. See, e.g., TENN. R. EVID. 409.1 cmt.

9. Formally, apology laws are reforms to state codes of evidence. See, e.g., IOWA CODE § 622.31 (2018) ("[T]hat portion of a statement, affirmation, gesture, or conduct expressing sorrow, sympathy, commiseration, condolence, compassion, or a general sense of benevolence . . . is inadmissible as evidence."). In contrast, traditional tort reforms often take the form of limitations on the damages plaintiffs may collect. See, e.g., CAL. CIV. CODE § 3333.2(b) (West 2018) ("In no action shall the amount of damages for noneconomic losses exceed [\$250,000].").

10. See Benjamin Ho & Elaine Liu, *Does Sorry Work?: The Impact of Apology Laws on Medical Malpractice*, 43 J. RISK & UNCERTAINTY 141, 144 n.4 (2011) [hereinafter Ho & Liu, *Does Sorry Work?*] ("California, Massachusetts, Florida, Tennessee, Texas, and Washington have general apology statutes that apply across all industries while the other 30 States have specific laws that only protect the statements of apology made by health care providers."). Since Ho and Liu completed their analysis, the number of states with apology laws has increased to 39. See *infra* note 81; *infra* Appendix A.

11. Yonathan A. Arbel & Yotam Kaplan, *Tort Reform Through the Back Door: A Critique of Law and Apologies*, 90 S. CAL. L. REV. 1199, 1201 (2017).

hearts of legislators and the public.”<sup>12</sup> Recent analyses of a variety of tort reforms have likewise included apology laws among the ranks of the more familiar reforms, such as caps on noneconomic damages.<sup>13</sup>

While apology laws represent a relatively recent revolution in the tort reform debate, they have gained acceptance in thirty-nine states to date<sup>14</sup>—outstripping many traditional reforms in popularity.<sup>15</sup> These laws have even received attention at the federal level: Then-Senators Barack Obama and Hillary Clinton introduced legislation that included a federal apology law.<sup>16</sup> As with the proposed federal law’s state counterparts, the legislation was directed not at realizing the therapeutic benefits of apologies, but at reducing the perceived high levels of medical malpractice litigation.<sup>17</sup>

Despite the significant uptick of apology laws among states, the attention at the federal level, and the interest in apologies as a litigation reduction strategy,<sup>18</sup> relatively little evidence exists on whether apology laws actually accomplish their goal of reducing litigation. Indeed, in a recent report to the Medicare Payment Advisory Commission that detailed the state of the evidence on a variety of tort reforms, Michelle Mello and Allen Kachalia noted that “[v]ery limited evidence exists on the effect of apology laws on liability.”<sup>19</sup> To date, we are aware of only two rigorous studies—both conducted by Benjamin Ho and Elaine Liu—

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12. *Id.* at 1200-01.

13. See MICHELLE M. MELLO & ALLEN KACHALIA, MEDICAL MALPRACTICE: EVIDENCE ON REFORM ALTERNATIVES AND CLAIMS INVOLVING ELDERLY PATIENTS 89-93 (2016), <https://perma.cc/WTM9-BSJQ> (including apology laws among other tort reforms); see also Michelle M. Mello et al., Perspective, *Medical Liability—Prospects for Federal Reform*, 376 NEW ENG. J. MED. 1806, 1806 (2017) (same).

14. See *infra* note 81; *infra* Appendix A.

15. For example, fewer than thirty-nine states have adopted noneconomic damages caps. See generally Ronen Avraham, *Database of State Tort Law Reforms (6th)* (The Univ. of Tex. Sch. of Law, Law & Econ. Research Paper No. e555, 2018), <https://perma.cc/88F7-DCMH> (providing comprehensive information on various tort reforms).

16. See National Medical Error Disclosure and Compensation (MEDiC) Act, S. 1784, 109th Cong. (2005); see also Hillary Rodham Clinton & Barack Obama, Perspective, *Making Patient Safety the Centerpiece of Medical Liability Reform*, 354 NEW ENG. J. MED. 2205, 2206 (2006) (discussing their proposal).

17. See Clinton & Obama, *supra* note 16, at 2206-07.

18. An entire organization is dedicated to advocating in favor of increased apologies in the medical malpractice context. See SORRY WORKS!, <https://perma.cc/7U8G-N6ZR> (archived Nov. 27, 2018).

19. MELLO & KACHALIA, *supra* note 13, at 91; see also Mello et al., *supra* note 13, at 1807 (noting that “[i]nsufficient evidence” exists to evaluate the effects of apology laws).



that have examined the role of apology laws in litigation.<sup>20</sup> Because apology laws are overwhelmingly targeted at medical malpractice, these studies specifically examined medical malpractice litigation.<sup>21</sup> In general, they found somewhat mixed results for the effect of apology laws, with some evidence suggesting these laws work as intended by reducing the risk of medical malpractice liability, and other evidence suggesting that apology laws may actually increase this risk.<sup>22</sup> However, as Ho and Liu note, this evidence was derived from a publicly available dataset of malpractice claims that excludes relevant information on a number of claims, such as those with no payment.<sup>23</sup>

This Article provides new empirical evidence that substantially expands the current understanding of the impact of apology laws. This empirical evidence is derived from a dataset of physicians and malpractice claims obtained directly from a large national malpractice insurer, which includes information that publicly available datasets do not. Specifically, our dataset includes approximately 90% of all physicians practicing within a particular specialty.<sup>24</sup> While we have the unprecedented ability to analyze nearly the universe of malpractice claims filed against an entire specialty over an eight-year period (2004 to 2011), due to confidentiality concerns we cannot identify either the specialty or the insurance company.<sup>25</sup> Focusing on a specific specialty enables us to hold constant the

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20. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 142; Benjamin Ho & Elaine Liu, *What's an Apology Worth?: Decomposing the Effect of Apologies on Medical Malpractice Payments Using State Apology Laws*, 8 J. EMPIRICAL LEGAL STUD. 179, 180 (2011) [hereinafter Ho & Liu, *What's an Apology Worth?*].

21. See, e.g., Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 142-44.

22. Compare *id.* at 156 (explaining that the results "show a consistent 14-15% increase" in claims resulting in a payout and an "increase of 20-27%" in total compensation paid to claimants), with Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 190 ("Physicians in states with apology laws would pay \$35,000 per case less than physicians in states without apology laws on average . . .").

23. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 143 ("Given that the [National Practitioner Data Bank (NPDB)] data set only consists of claims with positive payouts, it does not contain information on open claims nor closed claims without payments."); see also Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 184.

24. The insurer estimates that it insures more than 90% of physicians practicing in this specialty, and we are able to verify this estimate using independent information provided in the Health Resources & Services Administration's Area Health Resources Files, which include data on the number of physicians practicing in different specialties. See *Area Health Resources Files*, DATA.HRSA.GOV, <https://perma.cc/NBQ6-Y4WS> (archived Nov. 27, 2018).

25. These confidentiality conditions were included in our agreement with the insurance company that allowed us to analyze these data.

general range of medical conditions that are involved rather than using a sample of physicians with diverse specialties whose patients face quite different risks.<sup>26</sup>

Decomposing medical malpractice liability risk into the probability of claims and the magnitude of the loss associated with those claims, we find that apology laws do not achieve the goals laid out by state legislatures. In general, apology laws boost the probability that a physician who is not rated for surgery will be a party to a lawsuit to almost one and a half times the national average. Moreover, we find evidence that nonsurgeon physicians see their average malpractice payments increase as a result of apology laws. Because apology laws do not decrease the frequency of lawsuits or the average payment for surgeons, and increase both for nonsurgeons, they increase medical malpractice liability risk overall rather than reduce it.

At first glance, these results might seem surprising. In addition to being the opposite of the intended effect of these reforms, our findings are not consistent with case studies of physician apology and disclosure programs finding that these programs encourage physician-patient communication, reduce payments, and decrease the number of suits.<sup>27</sup> However, the success of particular programs may be influenced in part by where they are implemented—typically, academic medical centers—and by efforts that are undertaken in conjunction with apologies, so that the studies do not isolate the impact of apologies.<sup>28</sup> Our results are also not entirely consistent with the limited empirical evidence on apology laws.<sup>29</sup> But our results are derived from a dataset that provides substantially more detailed information on patients' claims and their outcomes than has been available in any previous study.

Based on our empirical analysis demonstrating that apology laws have not been successful in reducing medical malpractice liability, we make a series of recommendations to state legislatures and physicians who might contemplate using apologies. With respect to state legislatures, we argue that because apology

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26. We do not mean to suggest that every physician within a given specialty treats the same medical conditions. However, by restricting our analysis to a single specialty, we limit the problems that accompany comparing physicians who treat classes of patients with extremely disparate risks. See David M. Studdert et al., *Prevalence and Characteristics of Physicians Prone to Malpractice Claims*, 374 NEW ENG. J. MED. 354, 358, 359 tbl.2 (2016) ("Several physician characteristics, most notably the number of previous claims and the physician's specialty, were significantly associated with recurrence of claims.").

27. See, e.g., Allen Kachalia et al., *Liability Claims and Costs Before and After Implementation of a Medical Error Disclosure Program*, 153 ANNALS INTERNAL MED. 213, 215 (2010) (finding that a program which encouraged physicians to apologize decreased the risk of medical malpractice liability).

28. See *infra* Part IV.B.

29. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 159 ("[T]here is a short-term increase in the number of cases that normally take many years to resolve, but an overall decrease in the number of cases involving the least significant injuries." (footnote omitted)); Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 190 (noting that physicians in states with apology laws pay substantially less per case than physicians in states without these laws).

laws fail to achieve their stated goals, legislatures should consider alternative means of reducing malpractice litigation (assuming they remain committed to this goal). As to physicians, we propose that individual providers should avoid apologizing unless an apology is undertaken as part of a specific apology and disclosure program.

The remainder of this Article proceeds as follows. Part I discusses states' justifications for passing apology laws and the mechanisms by which these laws are supposed to reduce malpractice litigation. Part II presents the unique dataset that we examine and provides an overview of the litigation context in which apology laws function. Part III provides an empirical investigation of the effect of apology laws on a variety of litigation outcomes, including the probability that physicians will face claims and the payments they must make to resolve those claims. Part IV explores the policy implications of our results.

## **I. Apology Laws: Justification, Form, and Function**

Between 1999 and 2014, the number of states with apology laws increased from two to thirty-nine.<sup>30</sup> Having outstripped many traditional tort reforms in popularity and now covering a substantial proportion of the U.S. population,<sup>31</sup> apology laws have become an important factor in the ongoing debate over medical malpractice liability, litigation reduction, and tort reform. However, while they may be a new generation of tort reform,<sup>32</sup> apology laws are unlike previous reforms, both in terms of how they function and how they were enacted. This Part traces the development of apology laws, details the ways in which they seek to achieve the goal of litigation reduction, and outlines several different ways apology laws may function in practice.

### **A. Why "Sorry"? Why Apology Laws?**

"An apology, in its simplest terms, is an acknowledgement of responsibility for an offense coupled with an expression of remorse."<sup>33</sup> Though apologies may

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30. As discussed below, thirty-four of these states (as well as the District of Columbia) have partial apology laws and the remaining five have "full" apology laws. See *infra* note 81; *infra* Appendix A.

31. See Benjamin J. McMichael, *The Failure of "Sorry": An Empirical Evaluation of Apology Laws, Health Care, and Medical Malpractice*, 22 LEWIS & CLARK L. REV. (forthcoming 2019) (manuscript at 35), <https://perma.cc/QYE7-CBQL>; *id.* (manuscript app. at A9 tbl.A2).

32. See Arbel & Kaplan, *supra* note 11, at 1211; McMichael, *supra* note 31 (manuscript at 15-16).

33. Aaron Lazare, *The Healing Forces of Apology in Medical Practice and Beyond*, 57 DEPAUL L. REV. 251, 255 (2008); see also Erin Ann O'Hara & Douglas Yarn, *On Apology and Consilience*, 77 WASH. L. REV. 1121, 1131-32 (2002) ("[A]pologies are described generally as admissions of blameworthiness and regret for doing harm.").

be uncommon in the legal context, their therapeutic value has been well documented. Anecdotal evidence supports the intuition that an apology from an offender to a victim can almost instantaneously ease the victim's pain and assuage her anger.<sup>34</sup> More specifically, an apology can allow a victim to release anger in a healthy manner, to move through the grieving process, and to restore to her what was taken away by the offender.<sup>35</sup> When an offender apologizes, she both acknowledges her own fault and recognizes the harm to the victim,<sup>36</sup> thus restoring the victim's agency. Additionally, an apology from the offender can reduce the victim's attribution of fault to the offender and shift this attribution to reasons for the harm that were beyond the offender's control.<sup>37</sup>

With respect to apologies in the context of medical malpractice, research has confirmed that apologies are particularly important because "time is precious" and because "there is so much at stake," often even the patient's life or her ability to function.<sup>38</sup> An apology from a physician can allow the patient to feel cared for as well as restore the patient's self-respect and dignity following a medical error.<sup>39</sup> In addition to the therapeutic benefits of apologies that inure to victims, an apology from an offender can have social benefits as well. For example, Nicholas Tavuchis has noted that an apology acknowledges that a social rule has been violated, legitimizes "the wider social web in which the participants are enmeshed," and reaffirms the victim's position in the community.<sup>40</sup>

Because apologies have the potential to both restore social rules and shift the attribution of fault in the victim's mind from the offender to external factors beyond the offender's control, apologies can drastically affect dispute resolution following a transgression. Whether or not a legal claim is asserted and the course of a claim once asserted are "influenced by factors such as whether the injured

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34. See O'Hara & Yarn, *supra* note 33, at 1124. Psychological research, too, has found that apologies are associated with decreased aggression in the recipient. See Ohbuchi et al., *supra* note 2, at 224-26.

35. See Daicoff, *supra* note 2, at 143-50.

36. See Michael C. Jones, Note, *Can I Say I'm Sorry?: Examining the Potential of an Apology Privilege in Criminal Law*, 7 ARIZ. SUMMIT L. REV. 563, 567-68 (2014).

37. See Jennifer K. Robbennolt, *Apologies and Reasonableness: Some Implications of Psychology for Torts*, 59 DEPAUL L. REV. 489, 492 (2010).

38. See Lazare, *supra* note 33, at 264.

39. See *id.* at 263.

40. See NICHOLAS TAVUCHIS, *MEA CULPA: A SOCIOLOGY OF APOLOGY AND RECONCILIATION* 13 (1991).

person . . . attributes causation and fault to a third party [and] perceives that he or she has been treated unfairly."<sup>41</sup> By influencing these factors, apologies can "lead to greater willingness to settle claims and greater satisfaction with outcomes."<sup>42</sup>

Experimental research has generally supported these claims. For example, in one of the first evaluations of the effect of apologies on litigation, Russell Korobkin and Chris Guthrie asked survey participants to assume the perspective of a tenant in a landlord-tenant dispute.<sup>43</sup> When asked to evaluate a settlement offer by a hypothetical landlord, "tenants" were marginally more likely to accept the offer of settlement when the landlord apologized by saying, "I know this is not an acceptable excuse, . . . but I have been under a great deal of pressure lately."<sup>44</sup>

More recently, studies conducted by Jennifer Robbennolt have yielded similar results. In one study, participants were provided with a vignette that described a pedestrian-bicycle accident from the perspective of the victim and were then asked to evaluate a settlement offer from the injurer.<sup>45</sup> Relative to those who received no apology, participants who received a full apology from the injurer had a more favorable view of the injurer, viewed the injurer as more likely to be careful in the future, felt less angry at the injurer, and (most relevant here) were more likely to accept the settlement offer.<sup>46</sup> Interestingly, participants who received only a partial apology—an expression of sympathy without an acceptance of responsibility—did not experience the same effects as those who received a full apology, and they were more uncertain about whether to accept the settlement offer.<sup>47</sup>

In a later study, Robbennolt again asked participants to assume the role of victim in a pedestrian-bicycle accident and examined the influences of apologies on different judgments that may influence negotiation outcomes—what she calls "settlement levers."<sup>48</sup> The experimental results suggest that "apologies can promote settlement by altering the injured parties' perceptions of the situation and the offender so as to make them more amenable to settlement discussions

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41. Robbennolt, *supra* note 1, at 477.

42. *Id.*

43. See Russell Korobkin & Chris Guthrie, *Psychological Barriers to Litigation Settlement: An Experimental Approach*, 93 MICH. L. REV. 107, 117, 144-47 (1994).

44. See *id.* at 147-50.

45. See Robbennolt, *supra* note 1, at 483-90.

46. See *id.* at 485-90.

47. See *id.* at 484-86, 494-99.

48. See Robbennolt, *supra* note 3, at 356-65. "Settlement levers" include "the negotiators' reservation prices, their aspirations, and their conceptions of fairness." *Id.* at 343; see *id.* at 343-49.

and by altering the values of the injured parties' settlement levers in ways that are likely to increase the chances of settlement."<sup>49</sup> As in her previous work,<sup>50</sup> Robbennolt found that the nature of the apology itself—such as whether it contained both an expression of sympathy and acceptance of responsibility, or only an expression of sympathy—affected participants' perceptions.<sup>51</sup>

Experimental studies focusing specifically on health care and medical malpractice have reported similar findings. For example, Kathleen Mazor and colleagues examined patients' responses to medical errors in an experimental setting.<sup>52</sup> Members of a health care plan were provided with hypothetical descriptions of a medical error and the physician's response to that error.<sup>53</sup> In the hypothetical, the error could result in either a minor or life-threatening injury, and the physician could either deny responsibility and offer little information, or accept responsibility and provide detailed information on steps that would be taken to avoid similar errors in the future.<sup>54</sup> When the physician took responsibility, participants reported that they would be less likely to seek legal advice.<sup>55</sup> Moreover, in the event of an error, participants overwhelmingly reported that they would prefer that the physician apologize.<sup>56</sup> Similarly, Amy Witman and colleagues concluded from an experimental study that patients were more likely to pursue a claim against their physician following a medical error if the physician failed to acknowledge the error.<sup>57</sup> And Charles Vincent and colleagues found that over one-third of the people they surveyed who responded that something could have been done to prevent them from taking legal action might not have sued their physician after a medical error if they had received an apology and explanation.<sup>58</sup>

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49. *Id.* at 367-68; *see also id.* at 358-67 (describing the results of the experiments in detail).

50. *See* Robbennolt, *supra* note 1, at 485-500.

51. *See* Robbennolt, *supra* note 3, at 356-59.

52. *See* Kathleen M. Mazor et al., *Health Plan Members' Views About Disclosure of Medical Errors*, 140 ANNALS INTERNAL MED. 409, 409-12 (2004) [hereinafter Mazor et al., *Views About Disclosure*]; *see also* Kathleen M. Mazor et al., *Health Plan Members' Views on Forgiving Medical Errors*, 11 AM. J. MANAGED CARE 49, 49 & 52 n.7 (2005).

53. *See* Mazor et al., *Views About Disclosure*, *supra* note 52, at 409-11.

54. *See id.*

55. *See id.* at 413, 416.

56. *See id.* at 415 tbl.4.

57. *See* Amy B. Witman et al., *How Do Patients Want Physicians to Handle Mistakes?: A Survey of Internal Medicine Patients in an Academic Setting*, 156 ARCHIVES INTERNAL MED. 2565, 2566 (1996); *cf.* Marlynn L. May & Daniel B. Stengel, *Who Sues Their Doctors?: How Patients Handle Medical Grievances*, 24 LAW & SOC'Y REV. 105, 116 (1990) ("[P]atients are more likely to sue if their doctors fail to show concern for them personally.").

58. *See* Charles Vincent et al., *Why Do People Sue Doctors?: A Study of Patients and Relatives Taking Legal Action*, 343 LANCET 1609, 1612 (1994).

To some extent, all of these studies on the role of apologies in the medical malpractice context are extensions of the original work conducted by Gerald Hickson and colleagues.<sup>59</sup> Though they did not study apologies explicitly, theirs was one of the first studies to find evidence that compensation was not always the primary reason individuals pursued claims against their physicians.<sup>60</sup> Indeed, Hickson and colleagues found that the same percentage of patients indicated that they filed a claim because their physicians had failed to be completely honest with them as indicated that they filed a claim because they required remuneration for the financial costs of caring for the medically induced injury.<sup>61</sup> The strategy of using apologies to mitigate malpractice liability is essentially a strategy focused on the first group of patients—those who care about physician communication—rather than the second group, which is arguably where traditional tort reforms are focused in their attempts to place stricter limits on the amount of compensation courts may award.

The apology strategy has gained significant traction in the last two decades, and studies of hospital-specific apology and disclosure programs have confirmed that apologies can reduce both the frequency and size of medical malpractice claims. Studying a Veterans Affairs hospital that had introduced a proactive investigation, disclosure, and apology program, Steve Kraman and Ginny Hamm found that “[d]espite following a policy that seems to be designed to maximize malpractice claims,” the hospital had financial costs comparable to similar facilities without the program.<sup>62</sup> Similarly, Carol Liebman and Chris Hyman have recommended open communication to reduce the incidence of medical malpractice claims in Pennsylvania hospitals.<sup>63</sup>

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59. For the original work, see Gerald B. Hickson et al., *Factors that Prompted Families to File Medical Malpractice Claims Following Perinatal Injuries*, 267 JAMA 1359 (1992).

60. See *id.* at 1361.

61. See *id.*

62. See Steve S. Kraman & Ginny Hamm, *Risk Management: Extreme Honesty May Be the Best Policy*, 131 ANNALS INTERNAL MED. 963, 965-66 (1999).

63. See CAROL B. LIEBMAN & CHRIS STERN HYMAN, THE PROJECT ON MED. LIAB. IN PA., MEDICAL ERROR DISCLOSURE, MEDIATION SKILLS, AND MALPRACTICE LITIGATION: A DEMONSTRATION PROJECT IN PENNSYLVANIA 7 (2005), <https://perma.cc/7257-99GU> [hereinafter LIEBMAN & HYMAN, MEDICAL ERROR DISCLOSURE]; see also Carol B. Liebman & Chris Stern Hyman, *A Mediation Skills Model to Manage Disclosure of Errors and Adverse Events to Patients*, HEALTH AFF., July-Aug. 2004, at 22, 22-27 [hereinafter Liebman & Hyman, *A Mediation Skills Model*].

The most extensive studies of hospital-specific apology and disclosure programs have taken place in the University of Michigan Health System. Allen Kachalia and colleagues found that following the introduction of the program at the university hospital, demands for compensation fell by about one-third and the number of lawsuits fell by about two-thirds.<sup>64</sup> Studying the compensation paid out to claimants before and after the implementation of the program, the researchers found that the hospital saved almost 60% in compensation costs and that mean lawsuit costs fell by nearly 45%.<sup>65</sup> Richard Boothman and colleagues examined the same program and found that the average litigation costs were cut in half and that the average duration of the process decreased from about twenty months to eight months.<sup>66</sup> Focusing on claims specific to gastroenterology, Megan Adams and colleagues found, consistent with earlier work, that the average payment per claim and time to resolution decreased.<sup>67</sup> Moreover, they found that the number of patient encounters resulting in a claim decreased as well, suggesting that the apology program was successful in reducing claims overall.<sup>68</sup>

In general, this research demonstrates that apologies can be an effective malpractice mitigation strategy when implemented at specific hospitals. Given this success, it is not surprising that states interested in reducing malpractice litigation across their entire health care systems have turned to apologies as a strategy. However, the implementation of "apologies as malpractice mitigation" at the state level has been quite different than the implementation at the hospital level, the latter of which is often made in conjunction with strategies to foster the efficacy of apologies.<sup>69</sup> Based in part on the favorable reports of the impact of apologies on medical malpractice liability risk, states have enacted apology laws in order to facilitate apologies from physicians to patients. The next Subpart discusses these laws in detail.

#### B. Apology Laws: Form, Function, and Location

Though a robust and extensive body of evidence suggests that apologies have important therapeutic benefits, states have generally not focused on achieving those benefits when passing apology laws. Instead, they have focused on apologies as a means by which to reduce medical malpractice litigation. For

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64. See Kachalia et al., *supra* note 27, at 215 & tbl.1.

65. See *id.* at 217 & tbl.2.

66. See Richard C. Boothman et al., *A Better Approach to Medical Malpractice Claims?: The University of Michigan Experience*, J. HEALTH & LIFE SCI. L., Jan. 2009, at 125, 144.

67. See Megan A. Adams et al., *Effect of a Health System's Medical Error Disclosure Program on Gastroenterology-Related Claims Rates and Costs*, 109 AM. J. GASTROENTEROLOGY 460, 461-62 (2014).

68. See *id.* at 462.

69. See *infra* Part IV.



example, the author of the bill containing California's apology law "introduced th[e] bill in an attempt to reduce lawsuits and encourage settlements by fostering the use of apologies."<sup>70</sup> The advisory commission responsible for Tennessee's apology law explicitly included the mechanism by which it expected the law to work, stating that the law's "underlying theory... is that a settlement of a lawsuit is more likely if the defendant is free to express sympathy for the plaintiff's injuries."<sup>71</sup>

The mechanism by which apology laws, in theory, accomplish their goals is relatively simple. Apology laws encourage physicians to apologize, physicians apologize to patients, patients' anger is assuaged, and patients file fewer claims and more readily settle those claims that are filed.<sup>72</sup> Apology laws are designed to accomplish the first step—encouraging physician apologies—by reducing or eliminating the risks of apologizing, such as that the apology might be used against the physician in a determination of liability. Formally, apology laws are reforms to state rules of evidence, and they reduce the risks of apologizing by prohibiting the introduction of statements of sympathy, condolence, or apology into evidence at a subsequent malpractice trial.<sup>73</sup> These laws are necessary because without them, statements of apology made by physicians to patients would be admissible as a statement of a party-opponent.<sup>74</sup>

Apology laws generally rely on the theory that physicians will apologize more when those apologies are inadmissible as evidence, and that these apologies will decrease medical malpractice litigation. There are two different types of apology laws.<sup>75</sup> The first type—what have been called "partial" apology laws—

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70. CAL. EVID. CODE § 1160 cmt. (West 2018).

71. TENN. R. EVID. 409.1 cmt.

72. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 147-50.

73. For instance, Virginia's apology law states:

In any civil action brought by an alleged victim of an unanticipated outcome of health care, or in any arbitration or medical malpractice review panel proceeding related to such civil action, the portion of statements, writings, affirmations, benevolent conduct, or benevolent gestures expressing sympathy, commiseration, condolence, compassion, or a general sense of benevolence, together with apologies that are made by a health care provider or an agent of a health care provider to the patient, a relative of the patient, or a representative of the patient, shall be inadmissible as evidence of an admission of liability or as evidence of an admission against interest. A statement of fault that is part of or in addition to any of the above shall not be made inadmissible by this section.

VA. CODE ANN. § 8.01-581.20:1 (2018).

74. See, e.g., TENN. R. EVID. 409.1 cmt. ("The underlying theory of [the apology law] is that a settlement of a lawsuit is more likely if the defendant is free to express sympathy for the plaintiff's injuries without making a statement that would be admissible as an admission of a party opponent.").

75. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 146 (defining "partial" and "full" apology laws); see also McMichael, *supra* note 31 (manuscript at 13) (same).

protect only statements of condolence, sympathy, and the like.<sup>76</sup> The second type—what have been called “full” apology laws—protect such statements but also protect statements of fault, error, or liability.<sup>77</sup> In this Article, we focus on partial apology laws, which we will simply call “apology laws” for the sake of succinctness. We do so for three important reasons. First, these laws are substantially more popular than their “full” counterparts, with thirty-four states and the District of Columbia having partial apology laws on the books compared to only five states with full apology laws.<sup>78</sup> Second, we observe only 276 claims in states with full apology laws—about 7.5% of the total number of claims in our dataset—and we are unable to draw precise conclusions about the effects of these laws from such a small number of claims.<sup>79</sup> Third, full apology laws provide broader protections that include not only the apology but also other statements such as those pertaining to liability.<sup>80</sup> Because these laws may have a different legal effect based on the broader protections they offer, we cannot combine them with partial apology laws.

Figure 1 below provides an overview of changes in state apology laws between 2004 and 2011—the beginning and end of our data period, respectively, and Appendix A below provides a comprehensive overview of states’ adoption of apology laws.<sup>81</sup> Massachusetts led the way with the nation’s first apology law

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76. See, e.g., OR. REV. STAT. § 677.082 (2017).

77. See, e.g., GA. CODE ANN. § 24-4-416 (2018).

78. See *infra* note 81; *infra* Appendix A.

79. We do not combine partial apology and full apology laws into one broad category, as prior work has done, see, e.g., Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 146, because we find statistically significant evidence that these two types of laws do not have the same or similar effects on malpractice liability risk.

80. See, e.g., GA. CODE ANN. § 24-4-416(b) (protecting “any and all statements, affirmations, gestures, activities, or conduct expressing regret, apology, sympathy, commiseration, condolence, compassion, *mistake*, [or] *error*” (emphasis added)).

81. In addition to the thirty-four states with partial apology laws listed in Appendix A below, five states—Arizona, Colorado, Connecticut, Georgia, and South Carolina—have enacted full apology laws.

For Arizona’s law, see Act of Apr. 25, 2005, ch. 183, sec. 1, § 12-2605, 2005 Ariz. Sess. Laws 596, 597 (codified at ARIZ. REV. STAT. ANN. § 12-2605 (2018)).

For Colorado’s, see Act of Apr. 17, 2003, ch. 126, 2003 Colo. Sess. Laws 940 (codified at COLO. REV. STAT. § 13-25-135 (2018)).

For Connecticut’s, see Act of July 13, 2005, Pub. Act No. 05-275, § 9, 2005 Conn. Acts 992, 997-98 (Reg. Sess.) (codified as amended at CONN. GEN. STAT. § 52-184d (2017)).

For Georgia’s, see Act of May 3, 2011, No. 52, sec. 2, § 24-4-416, 2011 Ga. Laws 99, 111-12 (codified as amended at GA. CODE ANN. § 24-4-416).

For South Carolina’s, see South Carolina Unanticipated Medical Outcome Reconciliation Act, No. 373, 2006 S.C. Acts 2830 (codified at S.C. CODE ANN. § 19-1-190 (2018)).

in 1986, and Texas followed suit thirteen years later in 1999.<sup>82</sup> The fact that these two very different states were the first to adopt apology laws illustrates the bipartisan appeal of these laws, and their adoption generally has not been limited to red or blue states.<sup>83</sup> By 2004, the beginning of the period covered by our data, twelve states had enacted partial apology laws, and between 2004 and 2011, nineteen additional states and the District of Columbia enacted apology laws.<sup>84</sup> Thus, during the time period in which our analysis occurs, there were substantial changes in state apology laws: Nineteen states and the District of Columbia "switched" from having no apology law to having such a law. Figure 1 below further demonstrates that adoption of apology laws is not concentrated in one area of the country, or limited to predominantly urban or rural states.

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82. For Massachusetts's law, see Act of Dec. 24, 1986, ch. 652, 1986 Mass. Acts 1189 (codified at MASS. GEN. LAWS ch. 233, § 23D (2018)).

For Texas's, see Act of June 18, 1999, ch. 673, 1999 Tex. Gen. Laws 3244 (codified at TEX. CIV. PRAC. & REM. CODE ANN. § 18.061 (West 2017)).

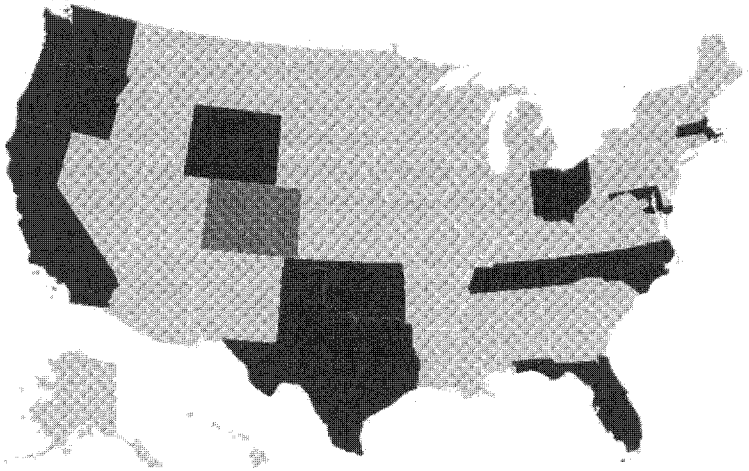
83. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 144.

84. Illinois enacted an apology law in 2005, see Act of Aug. 25, 2005, Pub. Act No. 94-0677, sec. 330, § 8-1901, 2005 Ill. Laws 4964, 5000-01 (codified as amended at 735 ILL. COMP. STAT. ANN. 5/8-1901 (West 2018)), but it became inoperative after other parts of the enactment were declared unconstitutional in 2010 by the Illinois Supreme Court, see *Lebron v. Gottlieb Mem'l Hosp.*, 930 N.E.2d 895, 914 (Ill. 2010). Illinois reenacted its apology law in 2013. See Act of Jan. 18, 2013, Pub. Act No. 97-1145, sec. 5, § 8-1901, 2012 Ill. Laws 6682, 6685 (codified at 735 ILL. COMP. STAT. ANN. 5/8-1901).

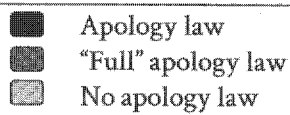
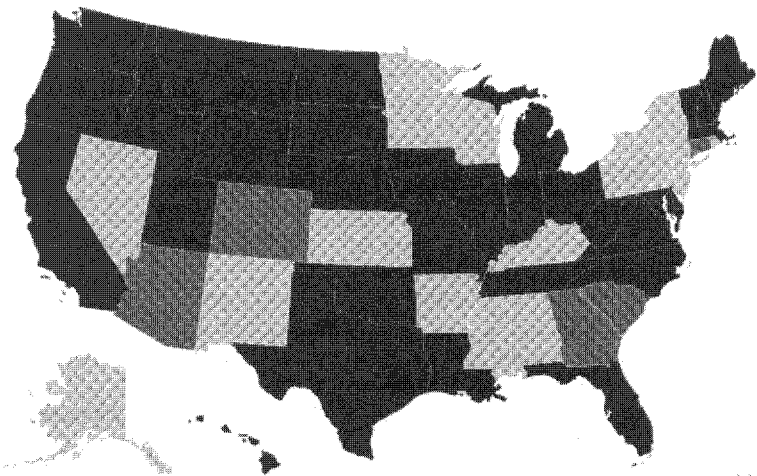
**Figure 1**  
Apology Laws over Time

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2004



2011



Apology laws have quickly become one of the most popular tort reforms in the country.<sup>85</sup> But they function differently enough from other tort reforms that caution should be exercised when extrapolating the effects of the former from the latter. The next Subpart discusses how apology laws work in practice and how they differ from other tort reforms.

### C. Just Another Tort Reform?: Competing Theories of Apology Laws

The mechanism by which traditional tort reforms accomplish their goal of reducing medical malpractice liability risk is straightforward. Traditional reforms benefit defendants by altering how courts may award damages. For example, caps on noneconomic damages simply restrict courts from awarding such damages over the cap amount.<sup>86</sup> Changes to the rules of joint and several liability alter the ways in which courts may apportion damages following a determination of liability.<sup>87</sup> These traditional reforms have received substantial attention from scholars, and research has demonstrated that they have the potential to impact medical malpractice litigation.<sup>88</sup> Patricia Born and colleagues have shown in a series of studies that tort reforms reduce malpractice insurance losses, premiums, and loss ratios (the ratio of claims paid out by an insurer to the premiums paid by subscribers).<sup>89</sup> Several systematic reviews of the evidence on tort reforms have concluded that while other reforms may have some effect on

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85. Compare *supra* note 81 (listing the five states with full apology laws), and *infra* Appendix A (listing the thirty-four states that have adopted partial apology laws), with Avraham, *supra* note 15 (listing other, more traditional tort reforms such as caps on noneconomic damages, and reporting that many other tort reforms have been adopted by fewer than thirty-nine states).

86. See OFFICE OF TECH. ASSESSMENT, OTA-BP-H-119, IMPACT OF LEGAL REFORMS ON MEDICAL MALPRACTICE COSTS 2 (1993), <https://perma.cc/Z4M9-FG2M>; see also Ronen Avraham, *An Empirical Study of the Impact of Tort Reforms on Medical Malpractice Settlement Payments*, 36 J. LEGAL STUD. S183 (2007) (exploring the effects of noneconomic damages caps on malpractice litigation).

87. See OFFICE OF TECH. ASSESSMENT, *supra* note 86, at 37; see also Avraham, *supra* note 86, at S202-03 (describing the effects of joint and several liability reform on malpractice litigation).

88. See, e.g., MELLO & KACHALIA, *supra* note 13, at 32-61 (discussing the available evidence on "traditional state tort reforms").

89. See Patricia Born et al., *The Effects of Tort Reform on Medical Malpractice Insurers' Ultimate Losses*, 76 J. RISK & INS. 197, 206-16 (2009) (finding that noneconomic damages caps reduce medical malpractice losses and increase the profitability of medical malpractice insurers); see also W. Kip Viscusi & Patricia H. Born, *Damages Caps, Insurability, and the Performance of Medical Malpractice Insurance*, 72 J. RISK & INS. 23, 38-40 (2005) (finding that insurers pass some of the savings from reduced malpractice liability payments on to physicians).

medical malpractice litigation, noneconomic damages caps have the most consistent effect.<sup>90</sup> Most relevant to this Article, Ronen Avraham examined a large sample of medical malpractice payments contained in the National Practitioner Data Bank (NPDB).<sup>91</sup> He found that noneconomic damages caps decrease the number of payments made to resolve malpractice disputes and reduce the size of those payments.<sup>92</sup>

While a substantial amount of evidence on traditional tort reforms suggests that some of these reforms may reduce the frequency and size of payments made to resolve medical malpractice claims,<sup>93</sup> it is not generally possible to extrapolate the effect of apology laws from this evidence because the specific way in which apology laws operate is different from other, more familiar tort reforms. In contrast to reforms such as damages caps, which require only an action by a court, apology laws require actions both by a court—excluding an apology from evidence—and by a physician—offering an apology—in order to be effective. Among tort reforms, this second step is unique to apology laws, as physicians must take an affirmative action in order to benefit from apology laws. Depending on how patients receive apologies, apology laws may accomplish their goal of reducing litigation or have exactly the opposite effect. And how patients receive apologies depends heavily on the nature of the physician-patient relationship.

In general, the physician-patient relationship with respect to malpractice may be characterized in one of two ways.<sup>94</sup> First, the relationship may be one of full information, such that when malpractice occurs, both the physician and patient are aware that it has occurred. For example, if a physician amputates the wrong limb or leaves a sponge in a patient's chest cavity, there will be little doubt in either the physician's or patient's mind that malpractice has occurred. Second, the physician-patient relationship may be characterized by asymmetric information, such that when malpractice occurs, the physician is aware of its occurrence but the patient is not. For example, if the physician misdiagnoses a medical condition, the patient, lacking any medical knowledge, will likely have

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90. See CONG. BUDGET OFFICE, THE EFFECTS OF TORT REFORM: EVIDENCE FROM THE STATES 12 tbl.2 (2004), <https://perma.cc/RX62-CJ3B>; MELLO & KACHALIA, *supra* note 13, at 32-61 (finding that traditional reforms other than damages caps have a mixed or no effect on medical malpractice liability risk).

91. See Avraham, *supra* note 86, at S187, S190.

92. See *id.* at S203, S208-10 (finding that noneconomic damages caps reduce medical malpractice liability risk). But see John J. Donohue III & Daniel E. Ho, *The Impact of Damage Caps on Malpractice Claims: Randomization Inference with Difference-in-Differences*, 4 J. EMPIRICAL LEGAL STUD. 69, 96 (2007) (finding that noneconomic damages caps do not reduce medical malpractice liability risk).

93. See MELLO & KACHALIA, *supra* note 13, at 32-61.

94. The discussion that follows is essentially a summary of the mathematical models developed by Ho and Liu. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 147-51.

little ability to discover this error. These two characterizations of the physician-patient relationship give rise to three competing theories of how apology laws may affect malpractice litigation.<sup>95</sup>

First, apology laws can work as legislatures intend: to reduce the probability of litigation and decrease payment amounts. If the patient and physician possess the same information—such that they both know when the patient's injury stems from the physician's malpractice and not some other cause (like the underlying illness)—then an apology can assuage the patient's anger,<sup>96</sup> discourage her from filing a lawsuit,<sup>97</sup> and encourage her to accept a lower settlement amount<sup>98</sup> or to settle more quickly.<sup>99</sup> This is, in fact, exactly how apology laws are designed to work,<sup>100</sup> and states appear to have implicitly assumed when passing apology laws that the physician-patient relationship is characterized by full information.

Second, if the physician knows more than the patient about whether malpractice has occurred, apology laws may increase the frequency of apologies and either increase or decrease both the probability of a malpractice claim and the size of the ultimate payment.<sup>101</sup> For example, when the physician possesses private information about whether the patient's injury is the result of malpractice, an apology may alert the patient to malpractice she would not otherwise have discovered or embolden the patient to conclude that malpractice has occurred when she would have otherwise been unsure.<sup>102</sup> Therefore, patients may sue more often and demand higher settlements when they receive apologies, as they learn of malpractice they otherwise would not have recognized. Even if patients cannot use the apology itself as evidence, the apology may alert patients to potential malpractice and encourage them to seek other forms of (admissible) evidence.<sup>103</sup>

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95. For an explanation of the mathematical models that underlie these theories, see *id.*

96. See Daicoff, *supra* note 2, at 143, 147.

97. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 150.

98. See *id.*

99. See Robbennolt, *supra* note 3, at 367-68.

100. See *supra* Part I.B.

101. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 147-50.

102. While it may seem that medical errors would be obvious to most people, the majority of victims never learn about the error that led to their injury. See Sandra G. Boodman, *Should Hospitals—and Doctors—Apologize for Medical Mistakes?*, WASH. POST (Mar. 12, 2017), <https://perma.cc/6VUC-TZP6> ("Most patients never learn they are victims of a medical error.").

103. See Anna C. Mastroianni et al., *The Flaws in State 'Apology' and 'Disclosure' Laws Dilute Their Intended Impact on Malpractice Suits*, 29 HEALTH AFF. 1611, 1616 (2010) ("Although a provider's words to a patient may be legally protected, the communication can still alert the patient to a potential legal claim. The legal discovery process can then be used to obtain independent evidence to prove malpractice.").

Third, apology laws may simply have no effect. If apology laws fail to encourage physicians to apologize, or if patients ignore any apologies that are offered, apology laws will not affect medical malpractice litigation.

Previous research on apologies and apology laws has found some support for the first two theories (though little evidence supports the third). For example, research on apologies has demonstrated that they can decrease patients' desire to sue their physicians, as discussed above.<sup>104</sup> Similarly, prior work focusing on specific apology and disclosure programs has found results generally consistent with apologies having their intended effect. As noted above, these programs reduce the number of claims filed, decrease the average payment per claim, and reduce the time between the initiation of a claim and claim resolution.<sup>105</sup>

However, the results derived from particular apology and disclosure programs may not be generalizable to apology laws, as studies specific to apology laws have found more mixed results. To date, Benjamin Ho and Elaine Liu have conducted the only rigorous empirical analyses of the effect of apology laws on medical malpractice liability risk.<sup>106</sup> Using data from the publicly available NPDB,<sup>107</sup> Ho and Liu found somewhat conflicting results. They found that apology laws increase the frequency of malpractice claims but that this increase dissipates over time.<sup>108</sup> On the other hand, they also found that, consistent with apology laws' intended effects, such laws reduce the delay between a malpractice event and the resolution of a claim.<sup>109</sup> Further, apology laws decrease the average payment per claim for claims involving the most severe injuries.<sup>110</sup> Ho and Liu also found that while apology laws reduce average payments by about \$32,000, they have a stronger effect on certain subsets of cases, such as those involving anesthesia or obstetrics.<sup>111</sup>

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104. See Vincent et al., *supra* note 58, at 1612; Witman et al., *supra* note 57, at 2566.

105. See Adams et al., *supra* note 67, at 461-63; Boothman et al., *supra* note 66, at 144; Kachalia et al., *supra* note 27, at 215-19. These studies all considered the same program, which was implemented at the University of Michigan Health System.

106. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 146; Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 182.

107. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 151.

108. See *id.* at 156, 163.

109. See *id.* at 159-62. The authors also noted that some evidence suggests settlement times decrease. See *id.* at 162. A similar analysis of our data does not yield results consistent with this effect.

110. See *id.* at 159-62.

111. See Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 188-90. Ho and Liu's finding that the effect of apology laws varies by type of injury, which in turn likely varies by specialty, suggests an important limitation of our study. Our specialty may not be representative of others, and our results may therefore not generalize to other specialties. Importantly, this suggests that future work on apology laws should investigate as many specialties as possible.



The existing evidence on apologies, apology and disclosure programs, and apology laws does not provide a clear picture of the role of apology laws in mitigating or exacerbating physicians' malpractice liability risk. To address the conflict in the existing literature, we explicitly test whether apology laws work as intended or if they have unintended effects. To do so, we exploit both the completeness of and the unique information provided by our dataset. This dataset and the malpractice litigation context in which our empirical analysis occurs are discussed in the next Part.

## II. Litigation Data

Before delving into the details of the empirical analysis, it is useful to consider the context in which that analysis occurs. This Part first discusses the rich dataset that we analyze. It then provides a thorough overview of the state of malpractice litigation against the specialist physicians on whom we focus our analysis.

### A. Malpractice Insurer Data: The Gold Standard

The dataset we use in our empirical analysis comes directly from a national malpractice insurer and contains information on 90% of all U.S. physicians practicing in a particular specialty from 2004 through 2014.<sup>112</sup> In other words, our data represent nearly a complete census of all physicians practicing within this specialty.<sup>113</sup> The data include information on all claims that were asserted against these physicians, whether or not the claimant ultimately received a payment and whether or not a formal lawsuit was filed.

Two different types of malpractice events appear in the data. Nonsuit claims involve patient demands for compensation that are resolved prior to the filing of a lawsuit. The other category of claims includes lawsuits that involve patient demands for compensation *and* the filing of a formal legal complaint. Either type of claim may or may not result in the patient receiving compensation. For each claim, the data include the total indemnity payment, which is the amount paid to the claimant as part of a settlement or judgment, and allocated loss adjustment

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112. For confidentiality reasons, we are not able to identify either the insurer or the specialty. We are not aware of and have not been able to find any reasons that the 10% of physicians excluded from our dataset would be concentrated in any particular region or disproportionately share any single characteristic. But because we do not observe these physicians, it is possible, if unlikely, that they systematically differ from the physicians included in our dataset.

113. It is important to note that while we observe nearly all physicians in a single specialty, we do not observe physicians in other specialties. Thus, it is possible that our results may not generalize to other specialties.

expenses (ALAE), which include the costs associated with defending or negotiating a particular claim, such as attorney fees, expert witness fees, and court fees.

We match each claim to its physician policyholder based on the year in which the injury occurred. While the data cover 2004 through 2014, we limit our analysis to claims from 2004 through 2011. Statutes of limitations for medical malpractice actions vary across states, but two to three years is common.<sup>114</sup> Excluding cases where the injury occurred after 2011 addresses the concern that later years might not include all instances of malpractice because claimants still have time to file a claim within the statute of limitations.<sup>115</sup> Our final sample includes nearly 75,000 physician-years.<sup>116</sup>

In addition to all claims asserted against individual physicians, we observe each physician's state of practice and whether each physician is rated for surgery. For this particular specialty, some physicians focus primarily on seeing patients in an office setting, while others both see patients in an office and perform surgery. We define a physician as a surgeon if she ever possessed a malpractice policy that rated her for surgery.<sup>117</sup> Approximately 75% of all physicians in our dataset are surgeons, and the status of a physician as a surgeon is critical to our empirical analysis, as described in detail below.<sup>118</sup>

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114. See, e.g., CAL. CIV. PROC. CODE § 340.5 (West 2018) (three years); OR. REV. STAT. § 12.110(4) (2017) (two years).

115. Our data were reported as of mid-2015. In general, including these later years in the analysis does not meaningfully affect any of the results described below.

116. A physician-year refers to an observation of a particular physician in a particular year. For example, observing the same physician between 2005 and 2010 would yield six physician-year observations.

117. We define surgeons in this way in order to err on the conservative side. Surgeons pay higher malpractice premiums than nonsurgeons since they face higher malpractice liability risk. Individual physicians elect whether to identify themselves as surgeons each year they purchase an insurance policy based on whether they perform surgery or not. While most physicians in our sample maintained consistent policy choices—always identifying as a surgeon or nonsurgeon—some physicians switched between the two policy options. It is possible that some physicians have inaccurately identified themselves as nonsurgeons, particularly since this would entail lower premiums, and we are unable to verify whether a physician actually performed surgery in any given year. Thus, we maintain the conservative definition of surgeon as any physician who ever identified herself as such.

Our approach necessarily involves the potential for misidentification—identifying nonsurgeons as surgeons or vice versa. But because we are unable to independently verify the surgeon status of individual physicians and because of the financial incentive to identify oneself as a nonsurgeon instead of a surgeon, we err on the side of overincluding surgeons. Importantly, using the yearly elections provided by individual physicians (so that a physician may be classified as a surgeon in one year and a nonsurgeon in another) results in little change in the estimates reported here.

118. See *infra* Part III.B.

For three reasons, the dataset we analyze represents the gold standard of litigation data. First, the data include information even on claims that resulted in no payment to the claimant. Thus, we observe medical malpractice cases that are never reported to the NPDB, which was used in previous studies of apology laws.<sup>119</sup> The inclusion of both zero and nonzero payments provides a more comprehensive picture of the medical malpractice landscape, as cases that result in no payment nevertheless impose direct costs in the form of ALAE and attendant higher premium rates for physicians, and indirect costs in the form of potential harm to physicians' reputations and time away from medical practices.<sup>120</sup> Second, our dataset includes information on claims that resulted in lawsuits as well as those that did not. Thus, our ability to analyze the role of apology laws is not limited to censored data that include information only on litigants who chose not to settle their claims before filing suit. Finally, our dataset is not subject to the reporting loopholes that have been well documented in publicly available datasets.<sup>121</sup>

To supplement the malpractice insurance data, we collected information on state apology laws for all fifty states and the District of Columbia. While we do not have information on whether a particular physician made an apology in a particular case, we do have information on the physician's state that can be used to construct a variable for the presence of an apology law. To be clear, no study of apology laws has ever been able to examine whether an apology was actually delivered.<sup>122</sup> Gathering this information would require data collection in the hospital room or medical office where the apology would be delivered. For privacy reasons and because of the difficulty in collecting such data across all

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119. See, e.g., Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 151; Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 180; see also *supra* note 23 and accompanying text.

120. See, e.g., David Dranove et al., *Delivering Bad News: Market Responses to Negligence*, 55 J.L. & ECON. 1, 22 (2012) (noting that physicians must take time away from their practices when a lawsuit is filed); Eric Helland & Gia Lee, *Bargaining in the Shadow of the Website: Disclosure's Impact on Medical Malpractice Litigation*, 12 AM. L. & ECON. REV. 462, 466 (2010) (describing how doctors seek to avoid the "reputational penalties" associated with malpractice litigation).

121. See Amitabh Chandra et al., *The Growth of Physician Medical Malpractice Payments: Evidence from the National Practitioner Data Bank*, 24 HEALTH AFF. W5-240, W5-241 to -242 (2005), <https://perma.cc/43CD-FWB4> (discussing reporting loopholes in the NPDB). For example, the "corporate shield" loophole allows any individual practitioner that was named as a defendant along with one or more corporate defendants—often hospitals—not to report the claim to the NPDB if she is dropped from the claim as part of a settlement agreement. See *id.* Hospitals may have financial and reputational incentives to shield physicians in this way. A physician will appear in our dataset as long as she was ever named as a party to a claim (whether or not she contributed any money to a final settlement).

122. See, e.g., Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 142, 151; McMichael, *supra* note 31 (manuscript at 37-40).

physicians in every state, information on the delivery of apologies is not available. Moreover, the relevant factor we analyze here is the existence of apology laws, not apologies themselves, because while states can pass apology laws, it would be exceedingly difficult (and perhaps illegal) for them to mandate apologies following medical errors.

In categorizing apology laws, we examined the relevant statutory language and classified each state as having an apology law (i.e., a "partial" apology law<sup>123</sup>), a "full" apology law, or no law. As reported in Appendix A below, thirty-four states and the District of Columbia have enacted apology laws (and five additional states have enacted "full" apology laws<sup>124</sup>). To control for the differences in treatment intensity across the country that have been well documented by the Dartmouth Atlas of Health Care,<sup>125</sup> we obtained information on health care infrastructure and population demographics from the Health Resources & Services Administration's Area Health Resources Files.<sup>126</sup> We collected information on the number of operating rooms per capita and the number of surgical operations per capita in each state. We also collected population information at the state level, including the percentage of the population that identifies as white, black, and Hispanic; the percentage of the population over sixty-five; the unemployment rate; the poverty rate; the median household income; and the population density.<sup>127</sup> All of the information described here was converted into variables defined at the state level for use in our empirical analysis.

## B. Suing Physicians

Once a patient decides to pursue a claim, she notifies the physician of her claim and the physician notifies his malpractice insurer. At this point, the claim becomes observable in our dataset. Figure 2 below provides an overview of the various paths a claimant may take in pursuit of compensation for her injury. We observe a total of 3,417 claims between 2004 and 2011, and each reported percentage in Figure 2 is the percentage of those claims that resulted in a particular outcome. Light gray cells represent outcomes in which the claimant receives no

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123. See *supra* text accompanying notes 75-77.

124. See *supra* note 81.

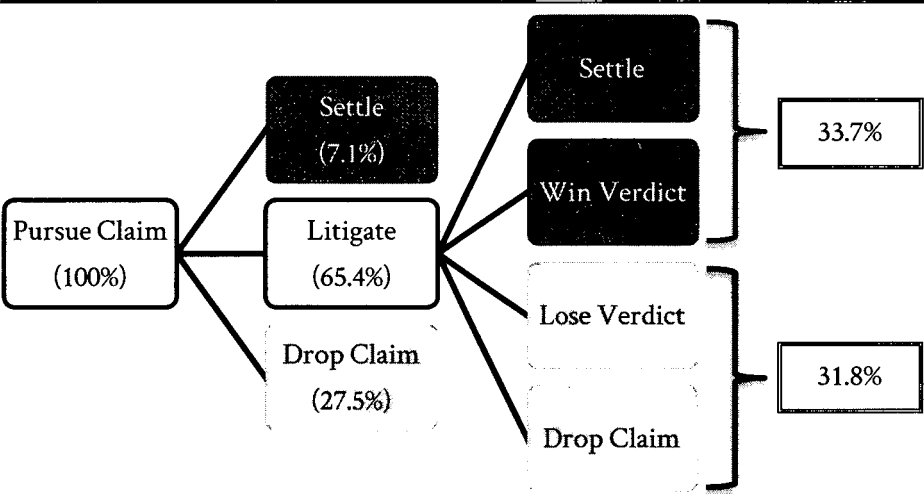
125. See *Understanding of the Efficiency and Effectiveness of the Health Care System*, DARTMOUTH ATLAS HEALTH CARE, <https://perma.cc/2SX5-RP9X> (archived Nov. 27, 2018). The Dartmouth Atlas of Healthcare has documented substantial regional variation in how health care is delivered. For example, a patient in one part of the country may receive a surgical intervention while a similar patient in another part of the country may receive only medication or physical therapy.

126. See *Area Health Resources Files*, *supra* note 24.

127. Population and demographic data in the Area Health Resources Files come from the American Community Survey and the U.S. Census Bureau. See *About the Data*, DATA.HRSA.GOV, <https://perma.cc/KJ28-MFW3> (archived Nov. 27, 2018).

payment, dark gray cells represent outcomes in which the claimant receives a payment, and white cells indicate situations in which the payment outcome has not yet been determined.

**Figure 2**  
Medical Malpractice Litigation Outcomes



A total of 3,417 claims were filed between 2004 and 2011. Each number shown represents the percentage of all claims that resulted in a particular outcome. Light gray cells represent outcomes where a patient received no payment. Dark gray cells represent outcomes where a patient received a positive payment. White cells represent intermediate steps that may or may not eventually result in a payment.

Following her decision to pursue a claim, a claimant may take one of three actions. First, she may drop the claim. Approximately 27.5% of all claims are dropped with no lawsuit filed and no settlement payment made to the claimant. Second, the parties may agree to settle the claim before a lawsuit is filed. Only 7.1% of claims are settled with a positive payment prior to the filing of a lawsuit. Third, if no settlement is reached and the claimant does not drop her claim, she may choose to litigate her claim by filing a lawsuit. Nearly two-thirds of claimants choose to file a lawsuit. Once in court, the claimant (now plaintiff) still has the option of dismissing her claim or settling with the physician. If she pursues her claim to a verdict, she may win or lose at trial. Within our dataset, we can differentiate between positive payments and zero payments to plaintiffs who have filed a lawsuit, but we cannot distinguish between payments as a result of settlements and verdicts for plaintiffs, or between nonpayments as a result of dropped claims and verdicts for defendants. Approximately 33.7% of plaintiffs obtain a payment after filing a lawsuit, while 31.8% receive no payment. While

these percentages do not elucidate the effect of apology laws, they provide a general picture of the litigation context in which our analysis occurs. The next Part details our empirical analysis of apology laws—an analysis that does elucidate the effect of apology laws.

### III. Empirical Analysis

Based on the unique breadth of information about malpractice claims available in our dataset, we are able to analyze apology laws in ways that have been, until now, infeasible given the limitations of publicly available data. In particular, we are able to test the effect of apology laws on the probability that individual physicians will face different types of malpractice claims. Perhaps more importantly, our dataset provides sufficient information to test whether the effect of apology laws differs depending on the presence of asymmetric information. We discuss this test before delving into the formal empirical methodology.

#### A. Testing the Competing Theories

The key difference between the intended effects and unintended effects theories is the presence of asymmetric information.<sup>128</sup> If physicians and patients both possess full information, apology laws can facilitate apologies, which can in turn assuage anger and decrease patients' propensity to sue.<sup>129</sup> If, on the other hand, physicians possess information that patients lack, apologies can serve as signals of malpractice, bolstering patients' beliefs that a claim is likely to be successful and encouraging them to file more claims.<sup>130</sup>

For example, consider a patient who undergoes a procedure that because of the physician's malpractice results in substantial harm to the patient. In the full information case, the physician and patient both know that the adverse event stemmed from the physician's negligence, and the patient may understandably be angry at the physician. In this case, an apology from the physician to the patient may assuage this anger and decrease the probability that the patient will sue the physician, consistent with previous experimental evidence.<sup>131</sup> Of course, the patient may pursue legal action even if she receives an apology, but an apology can decrease the probability of a claim by reducing one motivation for it—anger.

In the asymmetric information case, only the physician knows that the patient's injury stems from malpractice. The patient knows that she suffered an

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128. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 150-51.

129. See *id.* at 150.

130. See *id.* at 150-51.

131. See *supra* Part I.A.

injury, but she does not know if that injury is the result of malpractice, bad luck, or her underlying condition. If this patient then receives an apology, the patient may reasonably conclude that malpractice was the cause of the adverse event. With this information—even if any anger she experiences as a result of the malpractice is mollified to an extent by the apology—she may become more likely to pursue a malpractice claim against the physician.

The key difference between the asymmetric information case and the full information case is what the patient knows. Patients who possess full information know that malpractice occurred (and therefore that they have legal recourse), while patients in the asymmetric information case may not know that malpractice has occurred. Thus, while an apology may assuage anger in either case (thereby decreasing the probability of a claim), only in the asymmetric information case might an apology alert a patient to the occurrence of malpractice (thereby increasing the probability of a claim).

In our empirical analysis of apology laws, we cannot directly observe the presence of asymmetric information. Throughout our analysis, however, we differentiate between physicians rated for surgery and physicians not rated for surgery. We hypothesize that asymmetric information is more likely to be present in malpractice claims involving nonsurgeons than those involving surgeons. Surgeons generally interact with and treat patients in connection with a discrete event—that is, the surgery they are performing as well as any preoperative and postoperative care. Because of this discrete interaction, patients who suffer an injury will likely have little trouble tracing that injury to an error that occurred during surgery. On the other hand, nonsurgeons generally treat their patients over the course of years or interact with patients a number of times when attempting to resolve an injury or illness. Thus, observing the malpractice of nonsurgeon physicians may be more difficult. For example, if a physician fails to refer a patient for specialty care or improperly diagnoses the patient—two common bases for malpractice actions against nonsurgeons<sup>132</sup>—that patient may never learn of the physician's error, since she would generally have no way of independently learning that she required additional care or was misdiagnosed. Because the degree of asymmetric information is likely to differ systematically between surgeons and nonsurgeons, we exploit this difference in our empirical analysis and examine whether apology laws affect surgeons and nonsurgeons differently.<sup>133</sup>

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132. See Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 185 tbl.2, 186.

133. We do not mean to suggest that this is the only way to test whether asymmetric information plays a role in malpractice claims. Future work may investigate the presence of asymmetric information in other ways or using different data.

Returning to the three competing theories of apology laws discussed above,<sup>134</sup> we generate three testable hypotheses. The "intended effects" hypothesis, which implicitly relies on the absence of asymmetric information, predicts that apology laws will reduce both the frequency and size of malpractice claims. If this hypothesis is correct, then we should find a negative effect of apology laws on the frequency and size of claims, with no differential effect between surgeons and nonsurgeons. Next, the "unintended effects" hypothesis, which relies on the presence of asymmetric information, predicts that apology laws will increase the frequency and size of malpractice claims. Further, the hypothesis predicts that this increase will be larger for nonsurgeons, since the problem of asymmetric information is more acute. Finally, the "no effects" hypothesis predicts that apology laws will have no effect on either surgeons or nonsurgeons.

In this study, we do not observe whether apology laws actually increase the number of apologies by physicians.<sup>135</sup> We assume, however, consistent with prior work based on large datasets, that these laws do in fact facilitate apologies.<sup>136</sup> This assumption is supported by the facts that apology laws are generally announced to physicians by state medical societies and receive coverage in media outlets focusing on the health care industry. For example, the state medical society in Pennsylvania issued a press release announcing the passage of the state's new apology law almost immediately after it was passed.<sup>137</sup> The passage of this law was also covered by health care press outlets.<sup>138</sup> Thus, while physicians may not be specifically advised to apologize, they generally have ample notice that apologies are protected following the passage of an apology law.

While we make a similar assumption regarding the likely effect of apology laws as do Benjamin Ho and Elaine Liu,<sup>139</sup> our analysis differs from theirs in several important respects. In addition to our direct test of the intended and unintended effects hypotheses, we are able to address a number of data limitations

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134. See *supra* Part I.C.

135. See *supra* text accompanying note 122.

136. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 142 ("Although we do not observe actual apologies, the maintained assumption of this paper is that by reducing the consequences of apologies, doctors would apologize more frequently.").

137. See Press Release, Pa. Med. Soc'y, Lawyers and Doctors Come Together and Agree It's OK to Say 'I'm Sorry' (Oct. 23, 2013, 1:55 PM EDT), <https://perma.cc/9FH9-HNJA>; see also Benevolent Gesture Medical Professional Liability Act, No. 2013-79, 2013 Pa. Laws 665 (codified at 35 PA. STAT. AND CONS. STAT. ANN. §§ 10228.1-3 (West 2018)).

138. See, e.g., Brad Broker, *Pennsylvania Doctors Allowed to Say "I'm Sorry,"* PHYSICIANS NEWS DIG., <https://perma.cc/6A47-BAHY> (archived Nov. 27, 2018); Andis Robeznieks, *New Pa. Law Encourages Doc Apologies*, MOD. HEALTHCARE (Oct. 23, 2013), <https://perma.cc/Y96W-JAAW>.

139. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 142; Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 182-83.



Ho and Liu identified as resulting from the shortcomings of the NPDB.<sup>140</sup> First, that dataset includes only positive payments made to patients. Thus, if a patient drops her claim before receiving a payment, or if she loses in court, the NPDB does not include that case.<sup>141</sup> Analysis of our dataset indicates that ignoring claims that involved no payment to the claimant results in an exclusion of over half of all malpractice claims. The absence of cases involving no payment prevented Ho and Liu from examining the effect of apology laws on the probability that a physician will be a party to a malpractice case and on the legal costs associated with it. Second, while the NPDB theoretically includes all positive payments made by or on behalf of different types of providers, it excludes about 20% of those payments because of certain loopholes in reporting requirements.<sup>142</sup> Third, unlike our dataset, the NPDB does not include the actual dollar amount of payments made to plaintiffs. Instead, it reports only ranges into which a given payment falls (for example, between \$5,000 and \$10,000).<sup>143</sup> Finally, while the NPDB includes information on the nature of a patient's injury, it does not indicate the physician's specialty.<sup>144</sup> Our data contain only one specialty, which limits the confounding effects of examining many specialties at once. Nor does the NPDB indicate whether the insured physician is rated for surgery, which we find to be a key physician characteristic.<sup>145</sup>

Examining insurer data, we are able to directly examine the probability that a physician will face a malpractice claim. We are also able to estimate the probability that a given claim will result in a lawsuit. Based on the payment information contained in our data, we are able to estimate the effect of apology laws on the actual payment amount received by claimants as well as the costs associated with defending and negotiating claims. In doing so, we are able to address many of the limitations noted by Ho and Liu, while building upon their earlier analyses.

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140. See Chandra et al., *supra* note 121, at W5-241 to -242; Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 151 n.13.

141. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 151-52; Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 180.

142. See Chandra et al., *supra* note 121, at W5-241 to -242; *supra* note 121 and accompanying text.

143. See Health Res. & Servs. Admin., National Practitioner Data Bank Public Use Data File 23 (2018), <https://perma.cc/NK82-U6KR>.

144. See *id.* at 19. But see Studdert et al., *supra* note 26, at 355 (noting that data on physicians by specialty is available from the NPDB by "special application").

145. While the NPDB has a number of shortcomings, it does have an important advantage over the data used here in its inclusion of information on all specialties (in addition to information on providers beyond physicians). Thus, it may provide broader information than is available in our dataset.

## B. Empirical Methodology

The primary purpose of this Article is to provide evidence of the causal relationship between apology laws and medical malpractice litigation—not merely evidence of an association between the two. Ideally, we would randomly assign some physicians to receive the protections afforded by apology laws, while others would receive no protections. Both groups would then practice in nearly identical environments and respond to malpractice claims based on the presence or absence of an apology law. If we were able to approach laboratory conditions in this manner, we would be able to conduct a clean statistical analysis using the treatment group (physicians in states with apology laws) and control group (physicians in states without apology laws) to determine the causal effect of apology laws. Unfortunately, such an analysis is impossible given the ethical problems that would arise by randomly assigning some physicians but not others to receive the protection of an apology law, as well as the logistical difficulties in executing this type of an experiment with a sufficient number of physicians. Though we cannot achieve laboratory conditions, our goal of establishing a causal relationship between apology laws and medical malpractice litigation using observational data is best achieved by mimicking to the greatest extent possible a laboratory experiment. In other words, our goal is to eliminate as many potentially confounding factors as possible in order to isolate the effects of apology laws.

The fact that some states have passed apology laws while others have not provides a readily available treatment group and control group. Yet while the staggered passage of apology laws across different states provides useful treatment and control groups, the passage of these apology laws is almost certainly not random;<sup>146</sup> therefore, simple statistical comparisons as one might perform in a laboratory setting will not provide evidence of a causal effect of apology laws.

For example, one way to analyze apology laws involves looking at states that have passed these laws and comparing malpractice litigation data before and after their passage. While this would provide some information about the role of apology laws, a simple before-and-after comparison would not yield evidence of a causal relationship because physician treatment patterns, health care norms, legal norms, and many other factors are almost certainly changing over time as well. It would not be possible to disentangle the impact of all these factors—many of which are hidden from even the best data sources—from the impact of apology laws. Another way to analyze apology laws involves comparing litigation outcomes in states which have these laws to outcomes in states without

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146. The passage of apology laws is not random because legislatures make conscious efforts to change the law. While they may do so for different reasons (including the desire to facilitate settlements and decrease malpractice liability risk), the existence of those reasons suggests that apology laws are not randomly enacted.

these laws. But this approach, too, would not yield evidence of a causal relationship because states with and without apology laws may vary on many other dimensions—such as different judiciaries, different hospital regulations, different health care norms, and the like—that would confound any estimate of the effects of apology laws.

Thus, the problem with both of these straightforward comparisons is the lack of a valid control group. In both cases, the group of physicians who receive the protections of apology laws may also differ systematically in other ways from the group of physicians who do not. To address this problem and devise a valid counterfactual against which to compare physicians who are “treated” with an apology law, social scientists routinely estimate difference-in-differences models. These models exploit both of the above comparisons simultaneously to arrive at causal estimates.<sup>147</sup> Specifically, difference-in-differences models allow the comparison of physicians who are “treated” with an apology law to physicians who are subject to the same time-varying factors but are not “treated.”<sup>148</sup> They do this by “differencing out” all of the unobserved factors that may affect physicians over time and within individual states, thus isolating the causal effect of apology laws.<sup>149</sup>

As a hypothetical example, consider Kentucky and West Virginia. West Virginia’s apology law became effective in 2005,<sup>150</sup> while Kentucky has never passed such a law. Assume that had West Virginia not passed an apology law, its medical malpractice claim trend would have followed a trajectory similar to that of Kentucky.<sup>151</sup> The empirical test for whether apology laws influence claims is whether the change in the frequency of claims in West Virginia differs from what would be predicted based on the change in the frequency of claims in Kentucky. More generally, the difference-in-differences model estimates statistically whether an apology law has affected malpractice litigation by comparing the difference in claims before and after the law becomes effective with the counterpart difference in claims during the same timeframe in states without apology laws.

Suppose that the numbers of malpractice claims per 100 physicians in Kentucky and West Virginia in 2004 are 5 and 10, respectively. Then suppose that in 2005, the rates had risen to 25 and 20, respectively. A simple before and after

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147. See Michael D. Frakes, *The Surprising Relevance of Medical Malpractice Law*, 82 U. CHI. L. REV. 317, 364–66 (2015).

148. See *id.*

149. See *id.*

150. See Act of May 4, 2005, ch. 3, § 55-7-11a(b), 2005 W. Va. Acts 4, 6-7 (codified at W. VA. CODE § 55-7-11a(b) (2017)).

151. If West Virginia’s malpractice trend does not follow a similar trajectory as Kentucky’s, then Kentucky would not be a good control state. As detailed below, we run a series of tests which confirm that the states that did not enact apology laws serve as an acceptable control group for the states that did enact these laws. See *infra* Appendix B.

comparison in West Virginia would suggest that apology laws were responsible for an increase of 10 claims. Simply comparing West Virginia to Kentucky after the former passed its apology law would suggest that apology laws were responsible for a decrease of 5 claims. But neither of these calculations isolates the effect of apology laws. To do that, we would calculate a simple difference in differences. First, we would calculate the difference in the numbers of claims in both West Virginia ( $20 - 10 = 10$ ) and Kentucky ( $25 - 5 = 20$ ) before and after West Virginia passed its apology law. Second, we would calculate the difference between these two differences ( $10 - 20 = -10$ ) to conclude that the apology law resulted in a 10-claim decrease. Because this calculation effectively nets out the unobservable, idiosyncratic factors of practicing in West Virginia as well as those factors that change over time, it isolates the role of apology laws in malpractice litigation. Our primary empirical models use a substantially more comprehensive approach that relies on the staggered adoption of apology laws by nineteen states and the District of Columbia over a period of eight years. But the hypothetical example here still illustrates the essence of the models discussed below.

Throughout our analysis, we estimate ordinary least squares (OLS) regression models.<sup>152</sup> Our analysis of the effects of apology laws on medical malpractice liability risk proceeds in two parts. First, we examine the effect of apology laws on the probability that a physician will face different types of malpractice claims. In these models, the dependent variable is an indicator for whether an individual physician in a given year faced: (1) any claim, (2) a nonsuit claim, and (3) a lawsuit.<sup>153</sup> We then extend this analysis to consider the probability that different litigation outcomes will occur, conditional on a claim being asserted. In these models, the dependent variable is an indicator for: (1) whether a claim resulted in the filing of a formal lawsuit, (2) whether the claim was dropped prior to the filing of a lawsuit, and (3) whether, conditional on the claim not being dropped, it resulted in a lawsuit.<sup>154</sup>

In the second phase of our analysis, we examine the effect of apology laws on the magnitude of malpractice payments. The dependent variable in these

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152. The full specifications of each of our regression models as well as detailed results from these models are available in Appendix B below.

153. An indicator variable equals 1 if the specified outcome occurred and 0 otherwise. Dependent variables of this type allow us to examine the probability of a specified outcome occurring. Models with this structure are generally referred to as linear probability models.

154. The first category focuses on whether a claim ever developed into a lawsuit. The final category differs slightly in that it focuses on whether a claim developed into a lawsuit and includes only those claims that were never dropped.

models is the natural logarithm of different measures of litigation costs.<sup>155</sup> We begin by examining indemnity costs, which simply represent the amount of money paid by the insurer to the claimant to resolve the claim. We then examine ALAE, which are effectively the cost to the insurer for defending the claim. Finally, we examine the total costs—the sum of indemnity costs and ALAE.

In both parts of our analysis, the independent variables of interest are an indicator that equals 1 if a state had an apology law in place in a given year and the interaction of this variable with an indicator for whether a given physician is a surgeon. These separate variables allow us to test whether apology laws affect surgeons and nonsurgeons differently, which in turn allows us to test whether asymmetric information plays a role in how apology laws work. In addition to the variables representing whether an apology law is in force and whether the physician is a surgeon, the empirical models include a series of control variables to account for other factors that may influence the outcomes of interest. We include control variables for all of the health care infrastructure and population demographics discussed above.<sup>156</sup> We also include an indicator variable to control for whether a state had enacted a noneconomic damages cap,<sup>157</sup> and we include control variables for the number of physicians practicing in the state in the specialty we examine. In the models that include only malpractice claims that were actually asserted, we further include control variables for the type of injury suffered by the claimant.<sup>158</sup> Finally, all of the models include indicator variables for states and years. The inclusion of these variables is the key to estimating difference-in-differences models as described above. Throughout the analysis, we cluster the standard errors at the state level to account for the possible correlation of errors across different physicians in the state.<sup>159</sup>

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155. All of the litigation cost variables exhibit substantial right skewness. This means that while many of the cost variables were clustered around relatively low values, there were several awards that were considerably larger. It is standard practice in the literature to take the natural logarithm of a variable to transform a skewed distribution to a distribution that is closer to normal. See, e.g., Frakes, *supra* note 147, at 368; see also J. Shahar Dillbary et al., *Why Exempting Negligent Doctors May Reduce Suicide: An Empirical Analysis*, 93 IND. L.J. 457, 484 n.148 (2018) ("A standard practice in the literature, taking the log of the outcome, especially when it is a rate of the population, transforms the data from a skewed distribution to a more normal distribution set of data.").

156. See *supra* notes 125-27 and accompanying text.

157. We do not include controls for other tort reforms. This is discussed further in Appendix B below.

158. This is discussed in detail in Appendix B below.

159. Models without clustered standard error require the assumption that malpractice claim rates (or other outcomes of interest) in the same states are not correlated with each other over time (for instance, that the malpractice claim rate in New York in 2005 is not correlated with the malpractice claim rate in New York in 2006). This assumption is obviously unrealistic, and clustering standard errors at the state level obviates the need for this assumption. See Dillbary et al., *supra* note 155, at 495 & n.176.

### C. Results and Discussion

We begin by discussing the results for the effect of apology laws on claim probabilities. We then discuss the results for claim payments.

#### 1. The effect of apology laws on claim probabilities

Table 1 below provides an overview of the average number of physicians who experienced a claim each year. Between 2004 and 2011, about 4% of physicians experienced a malpractice claim each year in both jurisdictions with apology laws and those without. On average, about 1.4% of physicians had claims filed against them each year that did not involve lawsuits (i.e., nonsuit claims). About 2.6% of physicians had lawsuits filed against them each year. Fewer nonsuit claims were filed in states without apology laws, and fewer lawsuits were filed in states with apology laws. To isolate the causal effect of apology laws on the probability of a malpractice claim, we estimate a series of difference-in-differences models. We first estimate models that allow us to examine the probability that a physician will face any malpractice claim, face a nonsuit claim, and face a lawsuit. These models predict the change in the probability that a physician will face different types of malpractice claims using nearly 75,000 observations of physicians over an eight-year period. In the interest of succinctness and ease of exposition, we focus on the main effect of apology laws here.<sup>160</sup>

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160. Full regression results are available in Appendix C below.

**Table 1**  
Summary Statistics for the Number of Malpractice Disputes

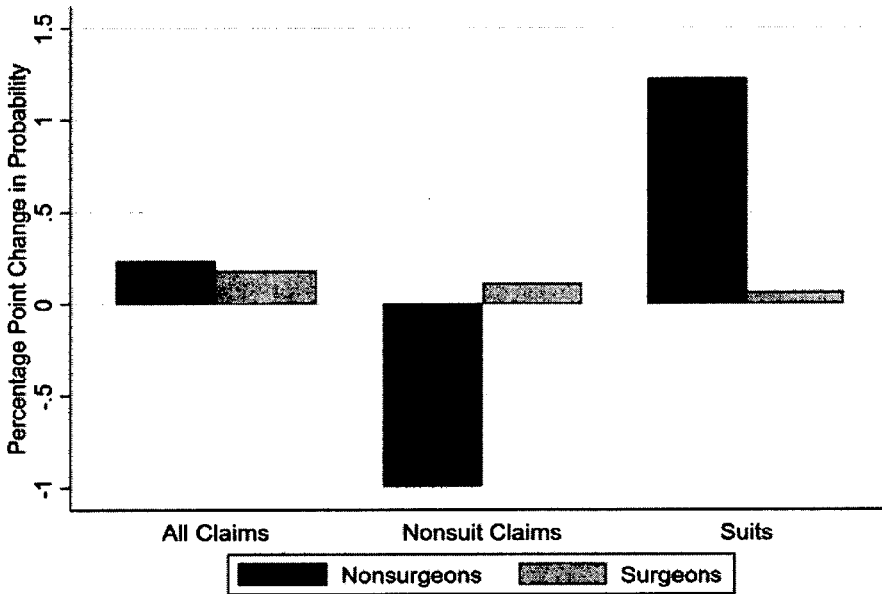
| Jurisdictions       | All Claims |       | Nonsuit Claims |       | Lawsuits |       |
|---------------------|------------|-------|----------------|-------|----------|-------|
|                     | Mean       | SD    | Mean           | SD    | Mean     | SD    |
| All                 | 0.040      | 0.197 | 0.014          | 0.118 | 0.026    | 0.160 |
| With Apology Law    | 0.041      | 0.198 | 0.018          | 0.133 | 0.023    | 0.149 |
| Without Apology Law | 0.040      | 0.195 | 0.008          | 0.087 | 0.032    | 0.176 |

The mean represents the average number of physicians who face a given type of malpractice dispute each year. SD represents the standard deviation.

Figure 3 below reports the effect of apology laws on the probability of facing different types of malpractice claims (any type of claim, a nonsuit claim, and a lawsuit). Specifically, each set of bars represents the percentage point change in the probability of facing a given type of claim for surgeons and nonsurgeons. In general, apology laws have little effect on the probability that physicians will face a generic type of malpractice claim.<sup>161</sup> Moreover, surgeons see little change in their likelihood of facing either a nonsuit claim or a lawsuit as a result of apology laws. Nonsurgeons, on the other hand, see the mix of malpractice claims they can expect to face change substantially as a result of apology laws. Apology laws decrease the probability of a nonsuit claim by 1.0 percentage point for nonsurgeons, which is substantial given that only about 1.4% of physicians experience nonsuit claims each year. Conversely, apology laws increase the probability of a lawsuit by 1.2 percentage points for nonsurgeons. This represents an approximately 46% increase in the probability of facing a lawsuit relative to the national average. Taken together, these results demonstrate that apology laws affect the mix of claims asserted against nonsurgeon physicians, increasing the share of claims involving a lawsuit and decreasing the share of nonsuit claims.

161. As noted below, apology laws have no statistically significant effect on the probability that either surgeons or nonsurgeons will face a generic claim. *See infra* Appendix B.

**Figure 3**  
Effect of Apology Laws on the Probability of Malpractice Disputes



$N = 74,440$ . Each set of bars represents the percentage point change in the probability that a physician will face a specific type of malpractice dispute. The average probability of facing any claim for physicians in our dataset is 0.04. The average probability of facing a nonsuit claim and lawsuit are 0.014 and 0.026, respectively. The regression results from which the information for this figure is derived are reported in Table C.1 below.

In general, these results are not consistent with the intended effect of apology laws, as these laws do not generally reduce either the total number of claims or the number of claims that result in a lawsuit. Apology laws have almost no effect on the probability that surgeons will face either a nonsuit claim or a lawsuit, but they do affect the mix of claims faced by nonsurgeons. Apology laws reduce the probability that a nonsurgeon will face a nonsuit claim. However, this reduction in the probability of a nonsuit claim is more than offset by the increased probability of a lawsuit. Overall, apology laws do not reduce the malpractice liability risk faced by the physicians in this specialty, and they increase the risk of lawsuits for nonsurgeons.

These results are generally consistent with the presence of asymmetric information, since apology laws do not appear to have their intended effect. The estimates for the effect of apology laws on the probability of facing a lawsuit, in



particular, suggest the presence of asymmetric information and support the unintended effects hypothesis. Nonsurgeons see the probability of facing a lawsuit increase as a result of apology laws, while surgeons do not see a similar increase. Assuming it is easier for patients to detect the malpractice of a surgeon than that of a nonsurgeon (and we would expect surgical errors to be more obvious given the nature of those errors),<sup>162</sup> the increase in the probability of a lawsuit for nonsurgeons and the absence of an increase for surgeons is consistent with the theory that apology laws may lead to an increase in patients' awareness of malpractice. Apologies may alert patients to errors they would not have discovered otherwise, encouraging them to file suit instead of settling or dropping their claims before filing in court.

To further explore whether patients substitute formal lawsuits for nonsuit claims as a result of apology laws, we limit our analysis to the 3,417 claims that were actually filed. Focusing on this limited sample, we estimate the effect of apology laws on different litigation outcomes, including whether a lawsuit was filed, whether a claim was dropped prior to the filing of a lawsuit, and whether a lawsuit was filed, conditional on the claim not being dropped.<sup>163</sup>

Figure 4 below reports results from our analysis of these litigation outcomes. The first set of bars represents the effect of apology laws on the probability that a claim against a physician will lead to a lawsuit. In general, nonsurgeons see the probability of a claim leading to a lawsuit increase by 8.4 percentage points as a result of apology laws—an approximately 13% increase relative to the national average. Surgeons see a much smaller increase.<sup>164</sup> The next set of bars captures the effect of apology laws on the probability that a claim will be dropped after it is asserted. For nonsurgeons, the probability that a claim will be dropped decreases by 8.2 percentage points as a result of apology laws—an approximately 30% decrease relative to the national average. Finally, the last set of bars in Figure 4 represents the effect of apology laws on the probability that a claimant will pursue a lawsuit, conditional on the claim not being dropped. In general, apology laws do not have a substantial effect on this probability for surgeons or nonsurgeons, though we estimate a positive effect of apology laws on this probability for both types of physicians.

As with the earlier results, the effects of apology laws reported in Figure 4 below support the unintended effects hypothesis and suggest the presence of asymmetric information. While apology laws have little effect on surgeons, they increase the probability that a claim filed against a nonsurgeon will lead to a lawsuit, suggesting that apology laws push claimants into the courtroom. Similarly, fewer claims against nonsurgeons are dropped, a result which is

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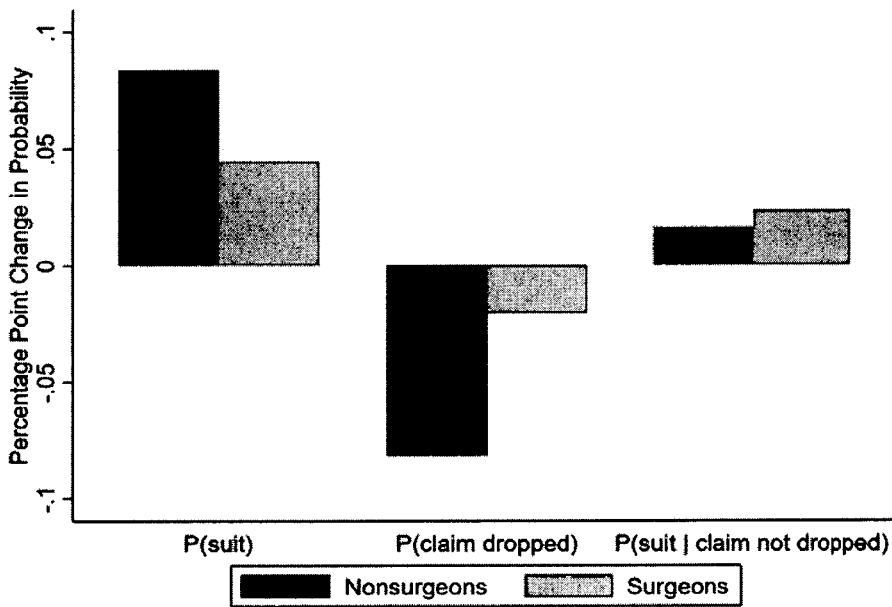
162. See *supra* Part III.A.

163. See *supra* note 154.

164. Across all of the results reported in Figure 4 below, apology laws never have a statistically significant effect on the litigation outcomes for surgeons.

consistent with the theory that in the absence of full information, apologies from physicians signal malpractice to patients and encourage them to press their claims when they otherwise might not have.

**Figure 4**  
Effect of Apology Laws on Litigation Outcomes



For the first two sets of results,  $N = 3,417$ . For the third set of results,  $N = 2,479$ . Each set of bars represents the percentage point change in the probability of the given litigation outcome, conditional on a claim being asserted. The regression results from which the information for this figure is derived are reported in Table C.2 below.

2. The effect of apology laws on malpractice payments

We now turn to the second component of malpractice liability risk—the magnitude of the loss from a claim. Table 2 below reports summary statistics for indemnity payments and defense costs (ALAE) for the entire sample of claims. Panel A reports statistics for all claims, for which the average indemnity payment was over \$73,000 and the average positive payment was over \$180,000.<sup>165</sup> Interestingly, the average defense costs are less than \$1,000 higher for claims that result in a payment relative to all claims, suggesting that the cost of defending a

165. Here and throughout the analysis, all payments and costs are reported in 2011 dollars.

claim does not depend heavily on whether the claimant is ultimately successful. Both the average indemnity payment and the average defense costs are higher in states without an apology law. Panels B and C focus on nonsuit claims and lawsuits, respectively. The average indemnity payments and defense costs are substantially higher for lawsuits than for nonsuit claims. The average indemnity payment for nonsuit claims is higher in states with an apology law. For lawsuits, however, the average indemnity payment is higher in states without an apology law.

**Table 2**  
Summary Statistics for Indemnity Payments and Defense Costs

|                                    | All Payments |           |           | Nonzero Payments |           |           |
|------------------------------------|--------------|-----------|-----------|------------------|-----------|-----------|
|                                    | N            | Mean      | SD        | N                | Mean      | SD        |
| <b>Panel A:<br/>All Claims</b>     |              |           |           |                  |           |           |
| Indemnity                          | 3,417        | \$73,506  | \$157,910 | 1,394            | \$180,179 | \$204,731 |
| Apology Law                        | 2,164        | \$59,739  | \$144,239 | 782              | \$165,315 | \$200,361 |
| No Apology Law                     | 1,253        | \$97,281  | \$176,631 | 612              | \$199,171 | \$208,810 |
| Defense Costs                      | 3,417        | \$37,615  | \$53,175  | 3,334            | \$38,552  | \$53,496  |
| Apology Law                        | 2,164        | \$34,825  | \$55,787  | 2,108            | \$35,751  | \$56,230  |
| No Apology Law                     | 1,253        | \$42,433  | \$47,972  | 1,226            | \$43,367  | \$48,078  |
| <b>Panel B:<br/>Nonsuit Claims</b> |              |           |           |                  |           |           |
| Indemnity                          | 1,182        | \$22,113  | \$82,484  | 244              | \$107,122 | \$154,667 |
| Apology Law                        | 956          | \$22,199  | \$78,829  | 195              | \$108,834 | \$145,300 |
| No Apology Law                     | 226          | \$21,748  | \$96,622  | 49               | \$100,307 | \$188,992 |
| Defense Costs                      | 1,182        | \$9,007   | \$18,436  | 1,137            | \$9,364   | \$18,708  |
| Apology Law                        | 956          | \$9,550   | \$19,622  | 920              | \$9,923   | \$19,910  |
| No Apology Law                     | 226          | \$6,714   | \$11,966  | 217              | \$6,993   | \$12,133  |
| <b>Panel C:<br/>Lawsuits</b>       |              |           |           |                  |           |           |
| Indemnity                          | 2,235        | \$100,685 | \$179,988 | 1,150            | \$195,679 | \$210,671 |
| Apology Law                        | 1,208        | \$89,448  | \$174,262 | 587              | \$184,077 | \$212,367 |
| No Apology Law                     | 1,027        | \$113,902 | \$185,715 | 563              | \$207,776 | \$208,390 |
| Defense Costs                      | 2,235        | \$52,745  | \$59,008  | 2,197            | \$53,657  | \$59,103  |
| Apology Law                        | 1,208        | \$54,829  | \$66,076  | 1,188            | \$55,752  | \$66,243  |
| No Apology Law                     | 1,027        | \$50,293  | \$49,335  | 1,009            | \$51,190  | \$49,310  |

Statistics in the left columns represent all claims. Statistics in the right columns are conditional on the indemnity payment being nonzero. SD represents the standard deviation. All dollar amounts are reported in 2011 dollars.

To test the causal relationship between apology laws and the magnitude of indemnity payments and defense costs, we again use difference-in-differences models.<sup>166</sup> We focus on three separate figures when exploring the effect of apology laws on the magnitude of malpractice claims: indemnity payments, defense costs (ALAE), and total costs (indemnity plus ALAE). We include all claims in our empirical models. This results in the inclusion of a large number of zero payments; however, including claims that result in both zero and positive payments in the same models is the correct approach.<sup>167</sup>

Figure 5 below reports the effects of apology laws across the three different payment types (all of which are conditional on a claim being asserted). Across all three payment types, physicians pay out more following the passage of an apology law, and the increase in payouts is always higher for nonsurgeons than for surgeons.<sup>168</sup> While apology laws increase both defense costs and the total cost of malpractice claims, these laws have the most dramatic effect on indemnity payments. The indemnity payments of surgeons barely increase, but the payments nonsurgeons make more than double following the passage of an apology law.

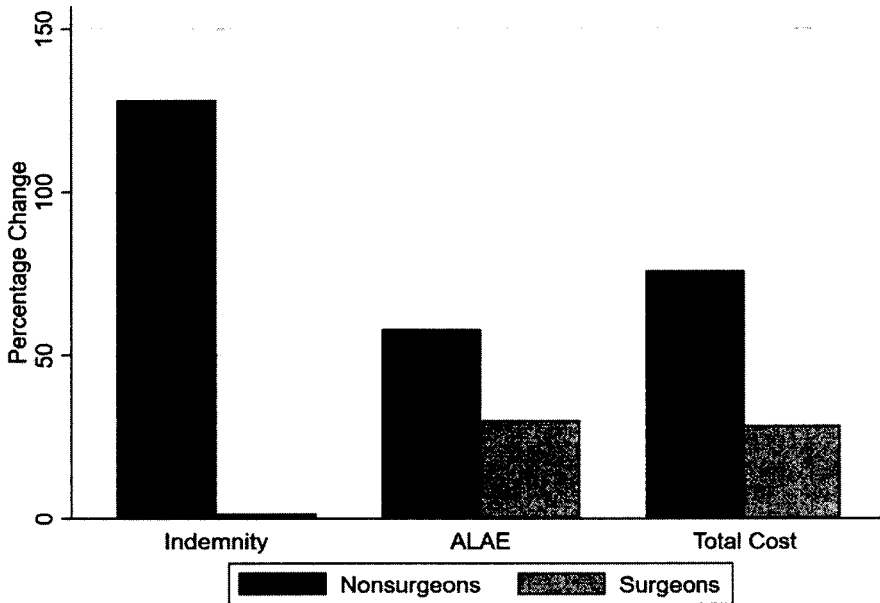
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166. The details of these models are discussed in Appendix B below.

167. This is discussed further in Appendix B below.

168. However, as shown in Appendix C below, the effects of apology laws are statistically significant only for indemnity payments.

**Figure 5**  
Effects of Apology Laws on Malpractice Payments



$N = 3,417$ . Each set of bars represents the percentage change in the given payment, conditional on a claim being asserted. The regression results from which the information in this figure is derived are reported in Table C.3 below.

Overall, the estimated effects of apology laws are not consistent with their intended effects, but they are consistent with the presence of asymmetric information. The fact that nonsurgeons see a much more dramatic increase in their indemnity payments suggests that patients can better determine whether malpractice has occurred following treatment by a surgeon than a nonsurgeon. As with the first phase of our analysis, all of the results in the second phase suggest that apology laws fail to achieve their stated goals.

#### IV. Policy Implications

In general, we find results that are not consistent with the stated goals of apology laws. We begin by reviewing the state of the evidence on apology laws before offering insight into why these laws may not be accomplishing their purposes. We then offer potential solutions that may accomplish, or at least further, the goals of apology laws.

### A. The State of the Evidence on Apology Laws

Overall, the evidence suggests that apology laws do not reduce physicians' malpractice liability risk. In general, unless a physician regularly performs surgery, she will see increases in both the probability of facing a lawsuit and the payment she can expect to make to resolve a claim. While nonsurgeons do see a decrease in the probability of facing a nonsuit claim, the evidence suggests that claimants are simply substituting formal lawsuits for nonsuit claims.<sup>169</sup> Although surgeons do not see as much of an increase in their risk of facing a lawsuit or in the payment they can expect to make to resolve a claim, they do not benefit from apology laws, as their malpractice liability risk remains relatively consistent regardless of whether there is an apology law in place.

These results are consistent with the unintended effects hypothesis discussed above.<sup>170</sup> A potential explanation for these relationships is the presence of asymmetric information, whereby apologies contain signals of malpractice that encourage patients to pursue lawsuits and larger indemnity payments.<sup>171</sup> To further explore the presence and effect of asymmetric information, future work may consider the effects of apology laws on other specialties that perform surgeries at different rates or undertake procedures that pose different risks.<sup>172</sup>

Our evidence has both some parallels as well as some differences with prior work on apology laws. In particular, Benjamin Ho and Elaine Liu found that apology laws consistently increase the frequency of malpractice claims with positive payouts by about 15%, consistent with the results here.<sup>173</sup> They further found that apology laws decrease the frequency of claims involving the least severe injuries, that apology laws have no statistically significant effect on the frequency of claims involving intermediate levels of injury, and that apology laws increase the frequency of claims involving the most severe injuries.<sup>174</sup> We find results generally consistent with these effects.

While our probability results are consistent with Ho and Liu's frequency results, we find no additional evidence from our state-level analysis that suggests the net effect of apology laws on medical malpractice liability risk is zero (or

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169. See *supra* Part III.C.

170. See *supra* Part III.A.

171. While our results are certainly consistent with the presence of asymmetric information, the data do not allow us to unequivocally exclude the possibility that other differences between surgeons and nonsurgeons may be responsible for the results.

172. It is important to note that the evidence presented here, while critically important, should not be interpreted as the final word on apology laws. Future work should investigate the effect of these laws on other medical specialties and over different time periods.

173. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 156 & tbl.3.

174. See *id.* at 157-62.

possibly negative) in the long run (many years after an apology law is passed).<sup>175</sup> Examining the probability that a physician will be subject to a claim directly, we find evidence that apology laws simply increase the probability of lawsuits for nonsurgeons in general and no evidence that this effect dissipates over time.<sup>176</sup> With respect to claim payouts, Ho and Liu found consistent evidence that apology laws decrease the size of claim payouts and that this decrease varies by factors such as the type of injury and the nature of the error.<sup>177</sup> But the results here suggest that while apology laws have little effect on surgeons, claim payouts actually increase for nonsurgeons. Similarly, we find no statistically significant evidence that claim payouts vary by injury type. The contrast in these results suggests that a dataset that excludes claims involving no payment to the claimant may not provide a complete picture of the effects of apology laws.

While our results are partially consistent with those of Ho and Liu, they directly contrast with other work finding that apologies implemented in specific health care systems decrease malpractice liability risk.<sup>178</sup> In particular, the evidence presented here strongly suggests that apology laws are not substitutes for specific physician apology and disclosure programs, and that the experiences of these types of programs are not generalizable to the physician population at large via apology laws. In other words, simply being allowed to apologize is not enough to reduce malpractice liability risk.

#### B. Why Are Apology Laws Not Enough?

The contrast in results between hospital-specific apology and disclosure programs and state-level apology laws raises the question: What separates the two? The answer almost certainly lies in training. Physicians in the disclosure programs that have been studied likely benefitted from being trained on when to apologize and what to say when apologizing.<sup>179</sup> For example, in the Communication, Apology, and Resolution (CARE) program recently implemented in several Massachusetts hospitals, preparations for the launch of the program required six to nine months and involved full-time project managers working

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175. *See id.* at 157 & tbl.4.

176. Repeating the state-level analysis performed by Ho and Liu, *see id.* at 154-59, we find no statistically significant results.

177. *See id.* at 159-62; Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 188-94.

178. *See, e.g.,* Adams et al., *supra* note 67, at 461-62; Boothman et al., *supra* note 66, at 143-44; Kachalia et al., *supra* note 27, at 215.

179. *See* LIEBMAN & HYMAN, *MEDICAL ERROR DISCLOSURE*, *supra* note 63, at 45-56. *See generally* Adams et al., *supra* note 67; Boothman et al., *supra* note 66; Kachalia et al., *supra* note 27; Liebman & Hyman, *A Mediation Skills Model*, *supra* note 63.



with senior hospital staff.<sup>180</sup> Training for the clinical staff involved "educational presentations, posters, intranet pages, and badge cards for clinicians with a 24/7 coaching/questions pager number."<sup>181</sup>

The importance of this training is illustrated by an Ohio case involving that state's apology law.<sup>182</sup> In *Davis v. Wooster Orthopaedics & Sports Medicine, Inc.*, an orthopedic surgeon who had caused the death of a patient told the victim's family that "he had nicked an artery and that he took full responsibility for it."<sup>183</sup> The Ohio Court of Appeals explained that although the physician contended that this admission fell within the ambit of Ohio's apology law,<sup>184</sup> it constituted an admission of fault and not simply a statement of condolence.<sup>185</sup> Thus, the court held that even though the physician believed his statements were protected, they were nevertheless admissible as evidence under Ohio's apology law.<sup>186</sup>

Similarly, in *Lawrence v. MountainStar Healthcare*, the Utah Court of Appeals addressed a situation where various health care providers made statements to a patient who was injured as a result of an incorrectly administered drug.<sup>187</sup> The

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180. See Michelle M. Mello et al., Appendix to *Outcomes in Two Massachusetts Hospital Systems Give Reason for Optimism About Communication-and-Resolution Programs* app. A3 at 9 (2017) [hereinafter Mello et al., Appendix to *Outcomes in Two Massachusetts Hospital Systems*], <https://perma.cc/3UYF-5ADF>; see also MASS. ALLIANCE FOR COMM. & RESOL. FOLLOWING MED. INJ., <https://perma.cc/5Z22-DYKU> (archived Dec. 28, 2018). For the full article by Michelle Mello and colleagues, see Michelle M. Mello et al., *Outcomes in Two Massachusetts Hospital Systems Give Reason for Optimism About Communication-and-Resolution Programs*, 36 HEALTH AFF. 1795 (2017) [hereinafter Mello et al., *Outcomes in Two Massachusetts Hospital Systems*].

181. Mello et al., Appendix to *Outcomes in Two Massachusetts Hospital Systems*, *supra* note 180, app. A3 at 9.

182. See Act of June 14, 2004, sec. 1, § 2317.43, 2003-2004 Ohio Laws 4146, 4146-48 (codified at OHIO REV. CODE ANN. § 2317.43 (LexisNexis 2018)).

183. 952 N.E.2d 1216, 1218 (Ohio Ct. App. 2011), *overruled in other part by* Stewart v. Vivian, 91 N.E.3d 716 (Ohio 2017).

184. Unlike other states with similar laws, Ohio's apology law does not specifically exempt admissions of fault from the protection afforded by the law. Compare OHIO REV. CODE ANN. § 2317.43(A), with, e.g., MD. CODE ANN., CTS. & JUD. PROC. § 10-920(b)(2) (LexisNexis 2018) ("An admission of liability or fault that is part of or in addition to a [protected] communication . . . is admissible as evidence . . .").

185. See *Davis*, 952 N.E.2d at 1218-21.

186. See *id.* at 1221. Adding to the confusion, the Supreme Court of Ohio subsequently reached a different conclusion regarding the scope of the state's apology law. See *Stewart*, 91 N.E.3d at 722 ("Applying the plain and ordinary meaning of the term 'apology,' . . . a 'statement[] . . . expressing apology' is a statement that expresses a feeling of regret for an unanticipated outcome of the patient's medical care and may include an acknowledgment that the patient's medical care fell below the standard of care." (second alteration in original) (quoting OHIO REV. CODE ANN. § 2317.43(A))).

187. See 320 P.3d 1037, 1041-45 (Utah Ct. App. 2014).

court held that some of the statements—those that expressed sympathy and condolence—were protected by Utah’s apology law, while statements that implied that the provider was at fault were not protected.<sup>188</sup> This case, along with the Ohio case, illustrates the importance of knowing what to say and when to say it, and apology laws themselves provide guidance on neither of these points. With apology laws, physicians are left to guess what exactly is protected by the law, what to say in order to effectively assuage patient anger, and when to apologize versus when to remain silent (to avoid sending a signal to the patient that malpractice has occurred). Combined with the results reported above, these cases suggest that hospital-specific apology and disclosure programs, which promote physician-patient communication and disclosure of adverse events, may be a better means to achieve the goals of apology laws.<sup>189</sup> For example, as part of the CARE program at several Massachusetts hospitals, physicians have access to both educational presentations as well as coaches who can advise them on how to effectively apologize.<sup>190</sup>

Beyond not providing physicians with guidance on how to apologize, apology laws may also suffer from poor statutory design. Anna Mastroianni and colleagues have explained that apology laws of the type we examine here are probably the result of legislative compromise, and do not protect the type of information that may be necessary for apologies to effectively dissuade patients from pursuing legal action.<sup>191</sup> If an apology law protects only statements of sympathy, physicians may not be able to fully explain the nature of a particular medical error.<sup>192</sup> If this is the case, then patients may not perceive an apology as sincere, which may provoke rather than assuage anger.<sup>193</sup> The critique offered by Mastroianni and colleagues is consistent with Jennifer Robbennolt’s experimental evidence on apologies.<sup>194</sup> Robbennolt found that a full apology can assuage patients’ anger and make them more amenable to settlement, but the

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188. See *id.* at 1046-51; see also UTAH R. EVID. 409.

189. Apology programs at specific hospitals or other institutions also often provide an early settlement offer program. See Adams et al., *supra* note 67, at 460 (noting that the program implemented at the University of Michigan Health System was “designed to efficiently respond to incidents of clear medical error with open disclosure, an offer of compensation, and efforts at quality improvement” (emphasis added)). This early settlement offer may be the key to discouraging lawsuits, especially if apologies themselves signal that malpractice has occurred.

190. See Mello et al., Appendix to *Outcomes in Two Massachusetts Hospital Systems*, *supra* note 180, app. A3 at 9.

191. See Mastroianni et al., *supra* note 103, at 1614-16.

192. See *id.*

193. See *id.* at 1616.

194. See Robbennolt, *supra* note 1, at 485-90; Robbennolt, *supra* note 3, at 359-61.

effect of partial apologies—the type protected by the laws we consider here—is not as strong.<sup>195</sup>

Even if there is a marginal decrease in patients' anger, expressions of sympathy may encourage patients to search for information and ultimately to turn to the legal system. Mastroianni and colleagues note that the limited protection offered by apology laws may actually encourage, rather than discourage, malpractice claims because patients may not be able to obtain all of the information they desire about their injuries from statements involving only partial apologies.<sup>196</sup> This observation is consistent with our results.

Mastroianni and colleagues' critique of apology laws dovetails with the research Erin O'Hara O'Connor has conducted. She outlines four key components of an effective apology: (1) "the identification of a wrongful act," (2) "an expression of remorse," (3) "a promise to forbear future transgressions," and (4) "an offer to repair the damage in some way."<sup>197</sup> Apology laws fail to provide protection for all but the second component because the other components would be admissible as evidence of a physician's liability. The defects in the statutory structure identified by Mastroianni and colleagues and highlighted by O'Hara O'Connor may be exacerbated if physicians follow the general trend toward greater patient communication<sup>198</sup> in the presence of an apology law without fully understanding exactly what is protected by that law and what is not (as is illustrated by the Ohio and Utah cases discussed above).

Both empirical evidence and legal research suggest that apology laws are flawed and fail to achieve their stated goal of reducing medical malpractice liability risk. But this result raises an important question: If apology laws increase malpractice liability risk and, on balance, are not in physicians' best interests, why would physicians continue to apologize? While future research should investigate this question in detail, the most likely answer is that physicians have simply been conditioned to apologize with little training on how to do so effectively. Much of the popular, academic, and medical discussions surrounding apologies over the past two decades have been positive.<sup>199</sup> An advocacy organization has even been established with the specific goal of promoting apologies in the medical malpractice context.<sup>200</sup> Physicians may be familiar with this new

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195. See Robbennolt, *supra* note 1, at 488; Robbennolt, *supra* note 3, at 359, 360 tbl.1.

196. See Mastroianni et al., *supra* note 103, at 1616.

197. See Erin O'Hara O'Connor, *Organizational Apologies: BP as a Case Study*, 64 VAND. L. REV. 1959, 1965 (2011).

198. Cf. Mello et al., *Outcomes in Two Massachusetts Hospital Systems*, *supra* note 180, at 1795 ("[T]here has been increasing experimentation with approaches that channel disputes away from the tort system—most prominently, communication-and-resolution programs (CRPs).").

199. See, e.g., *id.* at 1802.

200. See SORRY WORKS!, *supra* note 18.

culture of apologies and may rush to apologize following an error without completely understanding the risks and complexities of apologies. Moreover, many physicians are not involved in multiple malpractice actions,<sup>201</sup> so they have little reason to know—particularly given the positive treatment of apologies from a variety of sources—that apologizing can increase their malpractice liability risk. Thus, apology laws may facilitate an increase in malpractice liability risk in spite of their stated goals.

### C. A Path Forward

None of the evidence presented above suggests that apology laws achieve their goals of reducing medical malpractice liability risk and facilitating settlement. Moreover, for physicians who do not perform surgery, apology laws have the perverse effects of increasing both the probability of facing lawsuits and the size of payments made to resolve claims. Given the failure of apology laws to achieve their intended effects on malpractice litigation, states may be well-advised to take one of two paths with respect to apology laws in the future: (1) repeal these laws or (2) rehabilitate them.

The most natural course of action may be to repeal apology laws, given their inability to achieve their stated purpose.<sup>202</sup> Our results do not indicate that any increase in medical malpractice liability risk would result. However, it is important to place our empirical results in a broader context. While the results undermine the notion that apology laws are effective at accomplishing the liability and cost reduction for which they were passed, our results do *not* undermine the other, verified benefits of apologies. Apologies remain an important part of our social fabric,<sup>203</sup> and the specific inability of apology laws to reduce litigation against physicians does not change this fact. O'Hara O'Connor has traced the role of apologies in primate and human behavior using an evolutionary approach,<sup>204</sup> concluding that apologies play an important role in society that is not likely to disappear in the future.<sup>205</sup> Thus, while apology laws are not

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201. See Studdert et al., *supra* note 26, at 356.

202. Cf. Arbel & Kaplan, *supra* note 11, at 1241 ("Based on this analysis, we call for a moratorium on apology laws and a political and legal revaluation of the ones that currently exist.").

203. See TAVUCHIS, *supra* note 40, at 12-14; Daicoff, *supra* note 2, at 144-51.

204. See O'Hara O'Connor, *supra* note 197, at 1964 ("Humans often de-escalate conflicts with conciliatory gestures, and evidence indicates that other highly evolved social species also use conciliatory gestures.").

205. See *id.* at 1965 ("Reconciliation among both humans and other primates often involves one party to the conflict placing itself in a position of clear powerlessness relative to the other and performing an act that represents a plea for future conflict to subside. Among humans, such gestures often take the form of apology." (footnotes omitted)).

effective at achieving the specific goal of reducing malpractice litigation, apologies nevertheless remain an important part of human interaction in their ability to “almost instantaneously erode the anger and pain associated with transgressions.”<sup>206</sup> If apology laws—even haphazardly—promote apologies that improve people’s lives, they may generate a net social benefit with respect to patients’ well-being, despite their failure to achieve their primary financial goal.

Along the same lines, though our results suggest that apology laws increase litigation against some physicians and increase the amount they must pay to resolve claims, this does not conclusively establish that apology laws harm society. We tested the specific hypothesis that apology laws have a more salient effect in situations characterized by asymmetric information and found consistent support for this hypothesis. To the extent that apology laws promote transparency in the physician-patient relationship through the revelation of otherwise hidden malpractice, they may benefit society. Indeed, this transparency may elucidate errors that would have been repeated but for the apology that was offered. Because this increased transparency comes at the cost of increased malpractice liability risk, state lawmakers must weigh transparency against liability in deciding whether to repeal apology laws.<sup>207</sup>

Next, if state lawmakers remain committed to the goals of apology laws but want a more effective means of accomplishing them, they may turn to hospital-specific apology programs that provide physicians with training on the effective utilization of apologies.<sup>208</sup> In particular, our results do *not* undermine the existing evidence on particular hospital-specific apology and disclosure programs. Multiple studies have confirmed that these programs can effectively reduce both the incidence and severity of malpractice claims,<sup>209</sup> and state lawmakers can shift their attention to these programs. New state laws could provide incentives for hospitals within a state to adopt these programs or simply make funds available to initiate them. Conveniently, hospitals need not start from scratch in developing their own programs, as the Agency for Healthcare Research and

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206. *See id.*

207. Additionally, when deciding on the future of apology laws, state lawmakers must consider the evidence that these laws promote the practice of defensive medicine and increase mortality rates among patients suffering from heart attacks. *See* McMichael, *supra* note 31 (manuscript at 49, 53).

208. A variety of programs have been developed and have seen early successes. One program that appears particularly well executed is the CARE program, which has been implemented at multiple hospitals in Massachusetts. *See supra* text accompanying note 190. This program provides training to clinical staff on how to communicate with patients as well as the administrative infrastructure at the highest levels of hospital administration necessary to ensure the success of the program. *See generally* Mello et al., *supra* note 180.

209. *See generally, e.g.,* Adams et al., *supra* note 67; Boothman et al., *supra* note 66; Kachalia et al., *supra* note 27.

Quality has developed the Communication and Optimal Resolution (CANDOR) Toolkit, which offers health care organizations the training to "[e]ngage patients and families in disclosure communication following adverse events" and was developed through expert analysis and a multimillion dollar grant initiative.<sup>210</sup> While other programs may be available, the CANDOR program would likely impose a relatively small financial burden<sup>211</sup> on states that remain committed to both the goals of apology laws and achieving those goals via the apology-reconciliation framework.<sup>212</sup>

Beyond the question of where should states go from here, our results have important implications for individuals directly affected by apology laws—patients, physicians, and the attorneys advising them. First, our results suggest that patients should consider seeking out additional evidence of malpractice when they receive an apology. Our results suggest that, particularly when patients may be less capable of learning about the occurrence of malpractice, apologies can serve as a signal that an error has been committed. With this information in hand, patients can seek legal advice and pursue additional evidence of malpractice. Second, our advice to physicians is simple: Do not apologize without specific training. While apologizing within specific apology and disclosure programs appears to be safe (from the physician's perspective) based on the existing evidence, our results suggest that apologizing with only the protection of an apology law tends to increase, not decrease, individual medical malpractice liability risk.

Finally, attorneys who represent physicians should offer the foregoing advice to their clients. Prior to the advent of the apology law "movement,"<sup>213</sup> attorneys routinely advised their physician clients not to apologize. Though this advice has been criticized,<sup>214</sup> our results suggest that the attorneys offering it were right all along. Apologies can be dangerous for physicians, even when their

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210. See *Communication and Optimal Resolution (CANDOR) Toolkit*, AGENCY FOR HEALTHCARE RES. & QUALITY, <https://perma.cc/JD3M-6WUB> (last updated Sept. 2017). This toolkit is extensive, and, importantly, it includes guides for assessing communication as well as video examples of appropriate and inappropriate disclosures to patients.

211. The financial burden of establishing the CANDOR program would be relatively small since the work of creating the program has already been completed. Interested states need only consult the Agency for Healthcare Research and Quality for details.

212. For states that want to achieve the goals of apology laws but are not committed to encouraging apologies to do so, traditional tort reforms remain an option. But while certain reforms have been more successful than apology laws in reducing malpractice litigation, not all reforms are created equal. See generally MELLO & KACHALIA, *supra* note 13 (reviewing the available evidence on a variety of tort reforms). Moreover, employing traditional tort reforms may not be feasible given the opposition to these reforms that is largely absent from the debate over apology laws. See Arbel & Kaplan, *supra* note 11, at 1208-15.

213. See Arbel & Kaplan, *supra* note 11, at 1203.

214. See Chandler Farmer, Note, *Striking a Balance: A Proposed Amendment to the Federal Rules of Evidence Excluding Partial Apologies*, 2 BELMONT L. REV. 243, 245-47, 249 (2015).

admissibility as evidence is protected by an apology law. On the other hand, attorneys representing patients should be more willing to investigate malpractice when an apology is offered. Though the apology itself may be inadmissible, other evidence is not, and the apology may be a red flag to begin searching for this evidence.

### Conclusion

While touted as a tort reform that might limit medical malpractice liability risk, apology laws differ from other, narrower tort reforms that only limit liability or limit damages. Of course, apology laws also impose limits: whether the apology can be introduced as evidence. But by creating an environment that is more conducive to apologies, apology laws also have important behavioral ramifications. The resulting apologies are not innocuous from a litigation standpoint, as they provide the patient with signaling information indicating that the physician has made a medical error. This information may boost the patient's estimate of the likelihood of success of a claim and may also bolster the patient's resolve in pursuing the claim. For physicians who are not surgeons, the net effect of apology laws is to increase, rather than decrease, the likelihood of a claim that results in litigation, the amount of damages associated with the claim, and the cost to the insurer of defending the claim.

As a new generation of tort reform, apology laws were designed to encourage settlements and reduce medical malpractice litigation, and currently a substantial proportion of individuals live in a state with an apology law.<sup>215</sup> Despite their status as one of the most popular tort reforms in the country, however, there is relatively little evidence on the role of these laws in medical malpractice litigation. This Article provides critical new evidence in the ongoing debate over apology laws by empirically analyzing the gold standard of malpractice data—data obtained directly from an insurance company's records. With more information on more claims than has previously been available, this Article analyzes the effects of apology laws on both the frequency and magnitude of claims.

The results of this analysis suggest that apology laws fail to achieve their goal of reducing litigation. While these laws have little effect on the malpractice liability risk faced by surgeons, nonsurgeons see an increase in the chances of facing a lawsuit as well as the size of the payment they must make to resolve a claim. These effects are consistent with an asymmetric information relationship between nonsurgeons and their patients. In general, we find little evidence to suggest that states should continue with apology laws as mechanisms for

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215. See McMichael, *supra* note 31 (manuscript at 35).

reducing litigation. Indeed, from the perspective of physicians—ostensibly, the intended beneficiaries of these laws—apology laws may actually be harmful, as they appear to increase malpractice liability risk. Overall, the evidence suggests that apology laws are simply not enough.



### Appendix A Jurisdictions with Partial Apology Laws

| Jurisdiction  | Year Coded as Effective <sup>216</sup> | Citation   |
|---------------|--|--|
| Massachusetts | 1986                                   | Act of Dec. 24, 1986, ch. 652, 1986 Mass. Acts 1189 (codified at MASS. GEN. LAWS ch. 233, § 23D (2018))  |
| Texas         | 1999                                   | Act of June 18, 1999, ch. 673, 1999 Tex. Gen. Laws 3244 (codified at TEX. CIV. PRAC. & REM. CODE ANN. § 18.061 (West 2017))                            |
| California    | 2000                                   | Act of July 21, 2000, ch. 195, 2000 Cal. Stat. 2223 (codified at CAL. EVID. CODE § 1160 (West 2018))   |
| Florida       | 2001                                   | Act of June 1, 2001, ch. 2001-132, 2001 Fla. Laws 1102 (codified at FLA. STAT. § 90.4026 (2018))   |
| Washington    | 2002                                   | Act of Apr. 3, 2002, ch. 334, 2002 Wash. Sess. Laws 1708 (codified as amended at WASH. REV. CODE § 5.66.010 (2018))                                    |
| Tennessee     | 2003                                   | TENN. R. EVID. 409.1 <sup>217</sup>  |
| Oregon        | 2003                                   | Act of June 16, 2003, ch. 384, 2003 Or. Laws 1419 (codified as amended at OR. REV. STAT. § 677.082 (2017))   |
| Oklahoma      | 2004                                   | Act of May 28, 2004, ch. 368, § 23, 2004 Okla. Sess. Laws 1666, 1692 (codified at OKLA. STAT. ANN. tit. 63, § 1-1708.1H (West 2018))                   |
| Ohio          | 2004                                   | Act of June 14, 2004, H.B. No. 215, sec. 1, § 2317.43, 2003-2004 Ohio Laws 4146, 4146-48 (codified at OHIO REV. CODE ANN. § 2317.43 (LexisNexis 2018)) |

216. For consistency, we followed Benjamin Ho and Elaine Liu in coding the year the law became effective. See Ho & Liu, *Does Sorry Work?*, *supra* note 10, at 145 tbl.1; Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 183 tbl.1. For changes that became effective after 2007 (the end of Ho and Liu's sample period), we coded a law as taking effect the year it became legally effective if the effective date fell in the first half of the year. If the effective date fell in the second half of the year, the law was coded as becoming effective the following year.

217. The Tennessee rules of evidence are amended by order of the state supreme court, rather than passed by the legislature. The rule of evidence codifying the apology law was added by order of the Tennessee Supreme Court on January 31, 2003. See TENN. R. EVID. 409.1.

| Jurisdiction   | Year Coded as Effective | Citation  |
|----------------|-------------------------|---|
| Wyoming        | 2004                    | Act of July 17, 2004, ch. 1, 2004 Wyo. Sess. Laws Spec. Sess. 1 (codified at WYO. STAT. ANN. § 1-1-130 (2018))  |
| North Carolina | 2004                    | Act of Aug. 2, 2004, No. 2004-149, § 3.1, 2004 N.C. Sess. Laws 495, 502 (codified at N.C. GEN. STAT. § 8C-1, r. 413 (2018))<br>N.C. R. EVID. 413  |
| Maryland       | 2004                    | Maryland Patients' Access to Quality Health Care Act of 2004, ch. 5, sec. 1, § 10-920, 2004 Md. Laws Spec. Sess. 28, 146-47 (codified at MD. CODE ANN., CTS. & JUD. PROC. § 10-920 (LexisNexis 2018)) |
| South Dakota   | 2005                    | Act of Feb. 18, 2005, ch. 117, 2005 S.D. Sess. Laws 168 (codified at S.D. CODIFIED LAWS § 19-19-411.1 (2018))   |
| Virginia       | 2005                    | Act of Mar. 23, 2005, ch. 649, sec. 1, § 8.01-581.20:1, 2005 Va. Acts 905, 907 (codified as amended at VA. CODE ANN. § 8.01-581.20:1 (2018))  |
| Montana        | 2005                    | Act of Mar. 24, 2005, ch. 42, 2005 Mont. Laws 128 (codified at MONT. CODE ANN. § 26-1-814 (2017))   |
| Missouri       | 2005                    | Act of Mar. 29, 2005, H.B. 393, sec. A, § 538.229, 2005 Mo. Laws 641, 654-55 (codified at MO. ANN. STAT. § 538.229 (West 2018))   |
| West Virginia  | 2005                    | Act of May 4, 2005, ch. 3, § 55-7-11a(b), 2005 W. Va. Acts 4, 6-7 (codified at W. VA. CODE § 55-7-11a(b) (2017))  |
| Maine          | 2005                    | Act of June 10, 2005, ch. 376, 2005 Me. Laws 1731 (codified at ME. STAT. tit. 24, § 2907 (2018))  |
| Louisiana      | 2005                    | Act of June 16, 2005, No. 63, sec. 1, § 3715.5, 2005 La. Acts 1008, 1009 (codified at LA. STAT. ANN. § 13:3715.5 (2018))  |

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| Jurisdiction  | Year Coded as Effective | Citation   |
|---------------|-------------------------|--|
| New Hampshire | 2005                    | Act of June 17, 2005, ch. 144, 2005 N.H. Laws 139 (codified at N.H. REV. STAT. ANN. § 507-E:4 (2018))  |
| Illinois      | 2005 <sup>218</sup>     | Act of Aug. 25, 2005, Pub. Act No. 94-0677, sec. 330, § 8-1901, 2005 Ill. Laws 4964, 5000-01 (codified as amended at 735 ILL. COMP. STAT. ANN. 5/8-1901 (West 2018)), <i>invalidated by</i> Lebron v. Gottlieb Mem'l Hosp., 930 N.E.2d 895 (Ill. 2010)<br>Act of Jan. 18, 2013, Pub. Act No. 97-1145, sec. 5, § 8-1901, 2012 Ill. Laws 6682, 6685 (codified at 735 ILL. COMP. STAT. ANN. 5/8-1901) |
| Indiana       | 2006                    | Act of Mar. 17, 2006, Pub. L. No. 76-2006, 2006 Ind. Acts 1605 (codified at IND. CODE §§ 34-43.5-1-1 to -5 (2018))   |
| Utah          | 2006                    | Act of Mar. 17, 2006, ch. 225, sec. 2, § 78-14-18, 2006 Utah Laws 1077, 1078 (codified as amended at UTAH CODE ANN. § 78B-3-422 (LexisNexis 2018))<br>UTAH R. EVID. 409  |
| Idaho         | 2006                    | Act of Mar. 24, 2006, ch. 204, 2006 Idaho Sess. Laws 623 (codified at IDAHO CODE § 9-207 (2018))   |
| Vermont       | 2006                    | Act of May 15, 2006, No. 142, 2006 Vt. Acts & Resolves 124 (codified at VT. STAT. ANN. tit. 12, § 1912 (2018))   |
| Iowa          | 2006                    | Act of May 24, 2006, ch. 1128, § 4, 2006 Iowa Acts 323, 324-25 (codified as amended at IOWA CODE § 622.31 (2018))  |
| Delaware      | 2006                    | Act of July 10, 2006, ch. 413, 75 Del. Laws 543 (codified at DEL. CODE ANN. tit. 10, § 4318 (2018))  |

218. Illinois first enacted an apology law in 2005, but had to reenact it in 2013 after the act containing the first version was held unconstitutional by the Illinois Supreme Court. See *supra* note 84.

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| Jurisdiction         | Year Coded as Effective | Citation   |
|----------------------|-------------------------|--|
| District of Columbia | 2007                    | Medical Malpractice Proceedings Act of 2006, No. 16-619, tit. III, sec. 302, § 16-2841, 54 D.C. Reg. 807, 816 (Dec. 28, 2006) (codified at D.C. CODE § 16-2841 (2018)) |
| North Dakota         | 2007                    | Act of Mar. 2, 2007, ch. 284, 2007 N.D. Laws 1136 (codified at N.D. CENT. CODE § 31-04-12 (2017))  |
| Nebraska             | 2007                    | Act of May 21, 2007, Legis. B. 373, 2007 Neb. Laws 1004 (codified as amended at NEB. REV. STAT. ANN. § 27-1201 (LexisNexis 2018))                                      |
| Hawaii               | 2007                    | Act of May 23, 2007, No. 88, 2007 Haw. Sess. Laws 153 (codified at HAW. REV. STAT. § 626-1, r. 409.5 (2018))<br>HAW. R. EVID. 409.5                                    |
| Michigan             | 2011                    | Act of Apr. 19, 2011, No. 21, 2011 Mich. Pub. Acts (codified at MICH. COMP. LAWS § 600.2155 (2018))  |
| Pennsylvania         | 2013                    | Benevolent Gesture Medical Professional Liability Act, No. 2013-79, 2013 Pa. Laws 665 (codified at 35 PA. STAT. AND CONS. STAT. ANN. §§ 10228.1-3 (West 2018))         |
| Wisconsin            | 2014                    | Act of Apr. 8, 2014, No. 242, 2013 Wis. Sess. Laws 1180 (codified at WIS. STAT. § 904.14 (2018))   |
| Alaska               | 2015                    | Act of July 8, 2014, ch. 62, 2014 Alaska Sess. Laws (codified at ALASKA STAT. § 09.55.544 (2018))  |

## Appendix B

### Technical Details of Regression Models

#### I. The Effect of Apology Laws on the Probability of a Claim

We use the following general linear probability model specification of the determinants of the probability of a malpractice claim:

$$I(Y)_{ist} = \beta_1(\text{apology law})_{st} + \beta_2(\text{apology law})_{st} \times (\text{surgeon})_i \quad (1) \\ + \beta_3(\text{surgeon})_i + X'_{st} + \delta_s + \tau_t + \varepsilon_{ist}.$$

In this specification,  $i$  indexes physicians,  $s$  indexes states, and  $t$  indexes time.  $I(Y)_{ist}$  is an indicator variable that takes the value 1 if physician  $i$  practicing in state  $s$  experienced a claim in year  $t$ . In later specifications,  $I(Y)_{ist}$  is an indicator for whether a physician faced a nonsuit claim and for whether a physician had a lawsuit filed against her.

The variable  $(\text{apology law})_{st}$  is an indicator for whether state  $s$  had enacted an apology law in year  $t$ . The data do not include information on whether an individual physician apologized in any given malpractice event, so, as discussed in the main text, a key identifying assumption of the model is that apology laws, in fact, facilitate apologies.<sup>219</sup> The  $(\text{surgeon})_i$  variable is an indicator for whether a physician  $i$  ever possessed a malpractice policy that rated her for surgery. We also include an interaction between the indicator variables representing whether a physician was a surgeon and whether a state had an apology law to examine whether apology laws affect surgeons differently than other physicians.

The vector  $X'_{st}$  includes control variables for all of the health care infrastructure and population demographics discussed in the main text,<sup>220</sup> as well as for the total number of physicians practicing in the state. The variables in this vector serve as proxies for health care infrastructure and treatment intensity, which prior work has shown varies substantially across the country.<sup>221</sup> This vector also includes an indicator for whether a state had enacted a noneconomic damages cap. We do not control for other tort reforms.<sup>222</sup> And we include state ( $\delta_s$ ) and time ( $\tau_t$ ) fixed effects.

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219. See *supra* Part III.B.

220. See *supra* notes 125-27 and accompanying text.

221. See *Understanding of the Efficiency and Effectiveness of the Health Care System*, *supra* note 125.

222. In general, the last wave of damages-related tort reforms occurred between 2002 and 2005. See Myungho Paik et al., *Damage Caps and Defensive Medicine, Revisited*, 51 J. HEALTH ECON. 84, 85 (2017). Because our analysis includes only the period from 2004 to 2011, state fixed effects control for other tort reforms. While we could include indicator variables for other tort reforms, there is little (and usually no) variation in those tort reforms during the time period we consider. Thus, the effect of these reforms will be completely absorbed by state fixed effects.

Throughout the analysis, all standard errors are clustered at the state level to correct for serial autocorrelation. We estimate linear probability models (LPMs) instead of nonlinear models, such as probit and logit models, in our analysis because this analysis focuses, in part, on the interaction between indicator variables. As Chunrong Ai, Edward Norton, and others have noted, for nonlinear models, the marginal effect of a change in two interacting variables is not always equal to the marginal effect of the change in the interaction term, which means that the coefficients and standard errors of interaction terms in nonlinear models must be addressed cautiously.<sup>223</sup> Benjamin Ho and Elaine Liu have followed a similar approach.<sup>224</sup>

We begin by estimating the effect of apology laws on the probability that a physician will be a party to a malpractice dispute in a given year. Table C.1 below reports results from LPMs with three different dependent variables. Column (1) reports results with an indicator for whether a physician will have any claim filed against her in a given year. Apology laws do not have a statistically significant effect on the probability that a physician will face a malpractice claim of any kind. Column (2) reports the results of an LPM with an indicator for whether a physician will face a nonsuit claim as the dependent variable.<sup>225</sup> Apology laws have different effects on the probabilities that surgeons and nonsurgeons will have nonsuit claims asserted against them. For nonsurgeons, apology laws decrease the probability of a nonsuit claim by 1.0 percentage point, which is substantial given that only about 1.4% of physicians face nonsuit claims each year.<sup>226</sup> For surgeons, apology laws result in a small, statistically insignificant increase of about 0.1 percentage point in the probability of a nonsuit claim.<sup>227</sup>

Column (3) of Table C.1 below reports the results of an LPM with an indicator for whether a physician will be a party to a medical malpractice lawsuit as the dependent variable. The coefficient estimates in column (3) follow the opposite pattern from those in column (2). For nonsurgeons, apology laws increase the probability of a lawsuit by 1.2 percentage points. This represents an approximately 46% increase in the probability of facing a lawsuit relative to the national

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223. See Chunrong Ai & Edward C. Norton, *Interaction Terms in Logit and Probit Models*, 80 ECON. LETTERS 123, 124 (2003); Edward C. Norton et al., *Computing Interaction Effects and Standard Errors in Logit and Probit Models*, 4 STATA J. 154, 154 (2004).

224. See Ho & Liu, *What's an Apology Worth?*, *supra* note 20, at 190.

225. Nonsuit claims include all claims that were asserted (and reported to the malpractice insurer) but never led to a formal lawsuit because they were either dropped or settled prior to the filing of a complaint.

226. See *supra* Table 1.

227. Throughout our analysis, we separately calculate the statistical significance of the joint effect of the apology law indicator and interaction term, although we do not separately report these tests in the interest of succinctness.

average.<sup>228</sup> For surgeons, apology laws have no statistically significant effect on the probability of a lawsuit. Taken together, the results in columns (2) and (3) demonstrate that apology laws affect the mix of claims asserted against nonsurgeon physicians.

To further explore whether patients substitute formal lawsuits for nonsuit claims as a result of apology laws, we limit our analysis to the 3,417 claims that were actually filed. Focusing on this limited sample, we estimate the following difference-in-differences model, conditional on a claim being filed:

$$I(Y)_{ist} = \beta_1(\text{apology law})_{st} + \beta_2(\text{apology law})_{st} \times (\text{surgeon})_i \quad (2) \\ + \beta_3(\text{surgeon})_i + X'_{st} + W'_{st} + \delta_s + \tau_t + \varepsilon_{ist}.$$

The dependent variable is an indicator for different litigation outcomes, including whether a lawsuit was filed, whether a claim was dropped prior to the filing of a lawsuit, and whether a lawsuit was filed, conditional on the claim not being dropped. The variables  $(\text{apology law})_{st}$  and  $(\text{surgeon})_i$  are as defined above. The vector  $X'_{st}$  contains the same control variables discussed above. The vector  $W'_{st}$  includes eight indicator variables for the severity of the injury suffered by the patient based on the injury classifications developed by the National Association of Insurance Commissioners.<sup>229</sup> Each injury is classified as one of the following: emotional, insignificant, minor temporary, major temporary, minor permanent, significant permanent, major permanent, grave, or death.<sup>230</sup> The vector  $W'_{st}$  includes indicators for each type of injury, with death as the omitted category. As before,  $\delta_s$  and time  $\tau_t$  are state and time fixed effects, respectively.

Table C.2 below reports results from a series of LPMS, all of which include only instances where a claim was asserted against a physician. The dependent variable in column (1) is an indicator for whether a lawsuit was filed. Nonsurgeons see the probability of a claim leading to a lawsuit increase by 8.4 percentage points as a result of apology laws—an approximately 13% increase relative to the national average of the probability that a claim will lead to a lawsuit within this specialty.<sup>231</sup> Neither the coefficient on the interaction between the apology law and surgeon indicators nor the joint effect of the apology law indicator and interaction term is statistically significant. The dependent variable in column (2) is an indicator for whether a claim was dropped before proceeding to litigation with no payment to the claimant. For nonsurgeons, the probability that a claim will be dropped decreases in the presence of apology laws by 8.2 percentage points (significant at the  $p < 0.10$  level)—an approximately 30% decrease relative to the national average of the probability that a claim will

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228. See *supra* Table 1.

229. See GUIDELINE FOR IMPLEMENTATION OF MED. PROF'L LIAB. CLOSED CLAIM REPORTING pt. A, § 7(F) (NAT'L ASS'N OF INS. COMM'RS 2010), <https://perma.cc/X8RX-4HWX>.

230. See *id.*

231. Our dataset shows the national average to be approximately 65%.

be dropped. Again, neither the interaction term nor the joint effect of the apology law indicator and interaction term is statistically significant. In column (3), apology laws have no statistically significant effect on whether a claimant will pursue a lawsuit, conditional on not dropping the claim.

## II. The Effect of Apology Laws on Malpractice Payments

To test the causal relationship between apology laws and the magnitude of indemnity payments and defense costs conditional on a claim, we estimate difference-in-differences models using the following general specification:

$$I(Y)_{ist} = \ln(\beta_1(\text{apology law})_{st} + \beta_2(\text{apology law})_{st} \times (\text{surgeon})_i) \quad (3) \\ + \beta_3(\text{surgeon})_i + X'_{st} + W'_{st} + \delta_s + \tau_t + \varepsilon_{ist}.$$

In this equation, the dependent variable, is the natural logarithm of the indemnity payment, the natural logarithm of defense costs, or the natural logarithm of total costs (indemnity plus ALAE).<sup>232</sup> All of the variables and vectors in this specification are as described above. Each specification includes state ( $\delta_s$ ) and time ( $\tau_t$ ) fixed effects, and the standard errors are clustered at the state level. We include all claims and suits that resulted in zero indemnity payments in these models. This results in a large number of zero payments; however, Joshua Angrist and Jörn-Steffen Pischke have argued that even in the presence of zeros, the marginal effects estimated by OLS are approximately correct.<sup>233</sup>

Column (1) of Table C.3 below reports results from an OLS model with the natural logarithm of the indemnity payment as the dependent variable. For non-surgeons, apology laws increase the size of the average indemnity payment, but the joint effect of the apology law indicator and interaction term with the surgeon indicator is statistically insignificant. In general, the average indemnity payment made by surgeons is higher than the average payment made by non-surgeons, as evidenced by the positive and statistically significant coefficient on the surgeon indicator. Interestingly, apology laws essentially narrow the gap between payments made by the two types of physicians. This is not consistent with the intended effect of apology laws, but it is consistent with the presence of an asymmetric information relationship. If patients can better determine the extent of injuries caused by surgeons than those caused by nonsurgeons, then apologies, serving as signals of malpractice, should increase the average indemnity payment made by nonsurgeons more than they increase the average indemnity payment made by surgeons.<sup>234</sup>

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232. Prior to taking the natural logarithm, we add 1 to all indemnity payments and defense costs.

233. See JOSHUA D. ANGRIST & JÖRN-STEFFEN PISCHKE, *MOSTLY HARMLESS ECONOMETRICS: AN EMPIRICIST'S COMPANION* 94-99 (2009).

234. See *supra* Part III.A.



Column (2) of Table C.3 below reports results from an OLS model with the natural logarithm of ALAE as the dependent variable. Apology laws do not have a statistically significant effect on the amount of resources expended to negotiate and defend claims. Similarly, in column (3), apology laws have no statistically significant effect on the total costs associated with claims. The lack of an effect in columns (2) and (3) suggests that apology laws are not effective in achieving one of their intended goals—reducing the costs expended in resolving malpractice disputes.

### III. Robustness Check: Event Study Models

As noted in the main text, one of the key assumptions underlying all difference-in-differences models is that the trend in the outcome variable is the same in the control group (here, states that did not enact apology laws) and the treatment group (states that did).<sup>235</sup> To test the validity of this assumption and ensure that our apology law variables are not simply picking up preexisting trends, we estimate a series of event study models. Specifically, we reestimate all of the models from our main analysis with the addition of an indicator for the year before an apology law was enacted, an indicator for the year of enactment, and an indicator for one-plus years after the apology law was enacted.

The results are reported in Tables C.4, C.5, and C.6 below. In general, we find no consistent evidence that the apology law results above simply reflect preexisting trends in the data. In fact, in the event study models that correspond to the models reported in Tables C.2 and C.3, the one-year lead has a different sign than the indicator for the year of enactment and the indicator for one-plus years after enactment. The only meaningful exceptions to this pattern are the event study models that correspond to columns (2) and (3) of Table C.1, where the lead and enactment indicators have the same sign as the one-plus years variable. However, the coefficients on the one-plus years variables are statistically significant while the other coefficients are not. Overall, the event study results demonstrate that the trend in the outcome variable was the same in the control and treatment groups, and that the apology law variables are not simply picking up some underlying preexisting trend.

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235. See *supra* Part III.B.

**Appendix C**  
**Regression Results**

**Table C.1**  
Linear Probability Model Results for the Effect of Apology Laws  
on the Probability of Malpractice Disputes

| <b>Variables</b>      | <b>(1)</b><br><b><i>I</i>(claim)</b> | <b>(2)</b><br><b><i>I</i>(nonsuit claim)</b> | <b>(3)</b><br><b><i>I</i>(suit)</b> |
|-----------------------|--------------------------------------|--|-------------------------------------|
| apology law           | 0.002<br>(0.005)                     | -0.010***<br>(0.003)                         | 0.012***<br>(0.004)                 |
| apology law × surgeon | -0.001<br>(0.005)                    | 0.011***<br>(0.003)                          | -0.012**<br>(0.005)                 |
| surgeon               | 0.037***<br>(0.003)                  | 0.007***<br>(0.002)                          | 0.031***<br>(0.004)                 |
| Observations          | 74,440                               | 74,440                                       | 74,440                              |
| R-squared             | 0.010                                | 0.010  | 0.008                               |

These regression results are partially reported in Figure 3 in the main text. The dependent variables are, respectively, indicators for whether a physician faced any claim, a nonsuit claim, or a lawsuit in a given year. All regressions include state and year fixed effects. Other covariates include: an indicator for whether a state had adopted a noneconomic damages cap, the supply of specialty physicians at the state level, the percentage of the state population over sixty-five, the percentage white, the percentage black, the percentage Hispanic, the percentage in poverty, the state median household income, the state unemployment rate, and the state population density. Also included are the number of operating rooms per capita and the number of surgeries per capita at the state level.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

**Table C.2**  
Linear Probability Model Results for the Effect of Apology Laws  
on the Probability of Litigation Outcomes—Conditional on a Claim Being Asserted

| Variables             | (1)<br><i>I</i> (suit) | (2)<br><i>I</i> (claim<br>dropped) | (3)<br><i>I</i> (suit   claim<br>not dropped) |
|-----------------------|------------------------|------------------------------------|---|
| apology law           | 0.084**<br>(0.039)     | −0.082*<br>(0.045)                 | 0.016<br>(0.035)                              |
| apology law × surgeon | −0.039<br>(0.032)      | 0.061<br>(0.041)                   | 0.008<br>(0.029)                              |
| surgeon               | −0.022<br>(0.025)      | 0.004<br>(0.029)                   | −0.021*<br>(0.012)                            |
| Observations          | 3,417                  | 3,417                              | 2,479   |
| R-squared             | 0.202                  | 0.160                              | 0.152   |

The dependent variables are, respectively, indicators for whether a lawsuit was filed, for whether the claimant dropped her claim, and for whether a lawsuit was filed conditional on the claim not being dropped. All specifications are conditional on any claim being asserted. All regressions include state and year fixed effects. Each specification includes a set of eight indicator variables for different levels of injury severity (with death as the omitted category). Other covariates include: an indicator for whether a state had adopted a noneconomic damages cap, the supply of specialty physicians at the state level, the percentage of the state population over sixty-five, the percentage white, the percentage black, the percentage Hispanic, the percentage in poverty, the state median household income, the state unemployment rate, and the state population density. Also included are the number of operating rooms per capita and the number of surgeries per capita at the state level.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

**Table C.3**  
OLS Results for the Effect of Apology Laws on Malpractice Payments—  
Conditional on a Claim Being Asserted

| Variables             | (1)<br>ln(indemnity) | (2)<br>ln(ALAE)     | (3)<br>ln(total cost) |
|-----------------------|----------------------|---------------------|-----------------------|
| apology law           | 1.283*<br>(0.692)    | 0.580<br>(0.406)    | 0.759<br>(0.463)      |
| apology law × surgeon | -1.267**<br>(0.521)  | -0.279<br>(0.359)   | -0.473<br>(0.428)     |
| surgeon               | 1.809***<br>(0.375)  | 1.045***<br>(0.226) | 1.194***<br>(0.297)   |
| Observations          | 3,417                | 3,417               | 3,417                 |
| R-squared             | 0.126                | 0.154               | 0.169                 |

The dependent variables are, respectively, the natural logarithm of the indemnity payment, of ALAE, and of the total cost of a claim (indemnity plus ALAE). All regressions include state and year fixed effects. Each specification includes a set of eight indicator variables for different levels of injury severity (with death as the omitted category). Other covariates include: an indicator for whether a state had adopted a noneconomic damages cap, the supply of specialty physicians at the state level, the percentage of the state population over sixty-five, the percentage white, the percentage black, the percentage Hispanic, the percentage in poverty, the state median household income, the state unemployment rate, and the state population density. Also included are the number of operating rooms per capita and the number of surgeries per capita at the state level.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

**Table C.4**  
Event Study Results for the Effect of Apology Laws  
on the Probability of Malpractice Disputes

| Variables                                 | (1)<br><i>I</i> (claim) | (2)<br><i>I</i> (nonsuit claim) | (3)<br><i>I</i> (suit) |
|---|-------------------------|---------------------------------|------------------------|
| apology law (1-year lead)                 | -0.003<br>(0.008)       | -0.004<br>(0.006)               | 0.000<br>(0.008)       |
| apology law (enactment year)              | -0.003<br>(0.010)       | -0.003<br>(0.006)               | 0.000<br>(0.009)       |
| apology law (1+ years after)              | -0.008<br>(0.010)       | -0.013*<br>(0.007)              | 0.004<br>(0.011)       |
| apology law (1-year lead)<br>× surgeon    | -0.009<br>(0.010)       | 0.004<br>(0.007)                | -0.012<br>(0.007)      |
| apology law (enactment year)<br>× surgeon | -0.007<br>(0.008)       | 0.002<br>(0.006)                | -0.009<br>(0.006)      |
| apology law (1+ years after)<br>× surgeon | -0.001<br>(0.005)       | 0.012***<br>(0.003)             | -0.013**<br>(0.005)    |
| surgeon                                   | 0.038***<br>(0.003)     | 0.006***<br>(0.002)             | 0.032***<br>(0.004)    |
| Observations                              | 74,440                  | 74,440                          | 74,440                 |
| R-squared                                 | 0.010                   | 0.010                           | 0.008                  |

The dependent variables are, respectively, indicators for whether a physician experienced any claim, a nonsuit claim, or a lawsuit in a given year. All regressions include state and year fixed effects. Other covariates include: an indicator for whether a state had adopted a noneconomic damages cap, the supply of specialty physicians at the state level, the percentage of the state population over sixty-five, the percentage white, the percentage black, the percentage Hispanic, the percentage in poverty, the state median household income, the state unemployment rate, and the state population density. Also included are the number of operating rooms per capita and the number of surgeries per capita at the state level.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

**Table C.5**  
Event Study Results for the Effect of Apology Laws on the  
Probability of Litigation Outcomes—Conditional on a Claim Being Asserted

| Variables                                 | (1)<br><i>I</i> (suit) | (2)<br><i>I</i> (claim<br>dropped) | (3)<br><i>I</i> (suit   claim<br>not dropped) |
|---|------------------------|------------------------------------|---|
| apology law (1-year lead)                 | −0.150<br>(0.162)      | 0.113<br>(0.173)                   | −0.082<br>(0.159)                             |
| apology law (enactment year)              | −0.085<br>(0.146)      | 0.010<br>(0.097)                   | −0.100<br>(0.127)                             |
| apology law (1+ years after)              | 0.069<br>(0.123)       | −0.032<br>(0.094)                  | 0.031<br>(0.100)                              |
| apology law (1-year lead)<br>× surgeon    | 0.137<br>(0.158)       | −0.085<br>(0.193)                  | 0.071<br>(0.079)                              |
| apology law (enactment year)<br>× surgeon | 0.122<br>(0.111)       | −0.007<br>(0.096)                  | 0.133<br>(0.097)                              |
| apology law (1+ years after)<br>× surgeon | −0.039<br>(0.040)      | 0.058<br>(0.044)                   | 0.001<br>(0.034)                              |
| surgeon                                   | −0.036<br>(0.022)      | 0.013<br>(0.022)                   | −0.027**<br>(0.012)                           |
| Observations                              | 3,417                  | 3,417                              | 2,479   |
| R-squared                                 | 0.203                  | 0.160                              | 0.153   |

The dependent variables are, respectively, indicators for whether a lawsuit was filed, for whether the claimant dropped her claim, and for whether a lawsuit was filed, conditional on the claim not being dropped. All specifications are conditional on a claim being asserted. All regressions include state and year fixed effects. Each specification includes a set of eight indicator variables for different levels of injury severity (with death as the omitted category). Other covariates include: an indicator for whether a state had adopted a noneconomic damages cap, the supply of specialty physicians at the state level, the percentage of the state population over sixty-five, the percentage white, the percentage black, the percentage Hispanic, the percentage in poverty, the state median household income, the state unemployment rate, and the state population density. Also included are the number of operating rooms per capita and the number of surgeries per capita at the state level.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

**Table C.6**  
Event Study Results for the Effect of Apology Laws on  
Malpractice Payments—Conditional on a Claim Being Asserted

| Variables                                 | (4)<br>ln(indemnity) | (5)<br>ln(ALAE)     | (6)<br>ln(total cost) |
|---|----------------------|---------------------|-----------------------|
| apology law (1-year lead)                 | -1.389<br>(1.954)    | -2.316**<br>(1.044) | -2.472**<br>(1.142)   |
| apology law (enactment year)              | 2.046<br>(1.534)     | 0.299<br>(0.944)    | 0.672<br>(1.019)      |
| apology law (1+ years after)              | 1.512<br>(1.169)     | 0.621<br>(0.558)    | 0.820<br>(0.603)      |
| apology law (1-year lead)<br>× surgeon    | 0.791<br>(1.401)     | 2.721**<br>(1.236)  | 2.801**<br>(1.284)    |
| apology law (enactment year)<br>× surgeon | -2.135*<br>(1.209)   | 0.267<br>(0.805)    | -0.115<br>(0.910)     |
| apology law (1+ years after)<br>× surgeon | -1.014*<br>(0.556)   | -0.012<br>(0.327)   | -0.166<br>(0.397)     |
| surgeon                                   | 1.670***<br>(0.304)  | 0.757***<br>(0.164) | 0.889***<br>(0.236)   |
| Observations                              | 3,417                | 3,417               | 3,417                 |
| R-squared                                 | 0.127                | 0.159               | 0.174                 |

The dependent variables are, respectively, the natural logarithm of the indemnity payment, of ALAE, and of the total cost of a claim (indemnity plus ALAE). All regressions include state and year fixed effects. Each specification includes a set of eight indicator variables for different levels of injury severity (with death as the omitted category). Other covariates include: an indicator for whether a state had adopted a noneconomic damages cap, the supply of specialty physicians at the state level, the percentage of the state population over sixty-five, the percentage white, the percentage black, the percentage Hispanic, the percentage in poverty, the state median household income, the state unemployment rate, and the state population density. Also included are the number of operating rooms per capita and the number of surgeries per capita at the state level.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

