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

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

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ABSTRACT

Based on case studies indicating that apologies from physicians to patients can promote healing, understanding, and dispute resolution, 38 states have sought to reduce litigation and medical malpractice liability by enacting apology laws. Apology laws facilitate apologies by making them inadmissible in subsequent malpractice trials.

The underlying assumption regarding the potential efficacy of these laws is that, after receiving an apology, patients will be less likely to pursue a malpractice claim and will be more likely to settle those 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. The net effect on medical malpractice liability costs could be in either direction. Despite apology laws' status as the most popular, recently enacted tort reform and one of the most widespread tort reforms in the country, there is little evidence that they achieve their goal of litigation reduction.

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 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 single specialty over an eight-year period.

The analysis demonstrates that, for physicians who regularly perform surgery, which is a context in which patients should be aware of potential risks, apology laws do not have a substantial effect on the probability of facing a claim or the average payment made to resolve a claim. However, in situations of asymmetric information in which the physician has greater knowledge of the risks, the apology provides information that the patient does not have, thus providing a

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possible incentive to pursue a claim even though the apology cannot be introduced as evidence. For non-surgeons, we find that apology laws increase the probability of facing a lawsuit and increase the average payment made to resolve a claim, which is consistent with the presence of asymmetric information with respect to non-surgeons. 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 that occur daily. 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 in a later trial as evidence of liability, have counseled their clients to

avoid apologizing, and their clients have largely followed this advice.[1] However, 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 some transgression by the defendant, and these benefits can be particularly important following an injury severe enough to generate a lawsuit.[2] Defendants, too, may benefit from apologies, as some evidence suggests that, following an apology, injured parties may be less likely to assert claims, more likely to accept lower settlement offers, and more likely to resolve disputes quickly.[3]

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, as the apology itself may be evidence of fault and bolster plaintiffs' resolve to pursue claims. Alternatively, apologizing may assuage the anger of injured parties and forestall any legal claim or, if a claim is filed, facilitate settlement. Recognizing this conundrum, state lawmakers have taken action to 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, thereby encouraging defendants to apologize more often.[4] Though apologies can generate benefits for both plaintiffs and defendants, states have been very clear that, in passing these laws, they seek "to reduce lawsuits and encourage settlements"[5] based on "[t]he 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."[6]

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[1] Jennifer K. Robbennolt, *Apologies and Legal Settlement: An Empirical Examination*, 102 MICH. L. REV. 460, 477 (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.").

[2] Ken'ichi Ohbuchi et al., *Apology as Aggression Control: Its Role in Mediating Appraisal of and Response to Harm*, 56 J. PERS. SOC. PSYCHOL. 219, 221 (1989); *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."); *see also* Susan Daicoff, *Apology, Forgiveness, Reconciliation & Therapeutic Justice*, 13 PEPP. DISP. RESOL. L.J. 131, 134 (2013) (explaining that "[a]pology, forgiveness, and reconciliation can have great benefits by reducing . . . negative emotions and improving the potential for individual reform . . . [and] can maximize the therapeutic aspects of legal matters and minimize the anti-therapeutic ones for wrongdoers and affected persons alike.").

[3] Jennifer K. Robbennolt, *Apologies and Settlement Levers*, 3 J. EMPIRICAL L. STUD. 333, 367–68 (2006); Gerald B. Hickson et al., *Factors That Prompted Families to File Medical Malpractice Claims Following Prenatal Injuries*, 267 JAMA 1359, 1361 (1992).

[4] *See, e.g.*, FLA. STAT. ANN. § 90.4026 ("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.").

[5] California Assembly Comm. on Judiciary, *Historical Notes to Cal. Evid. Code* § 1160.

[6] TENN. R. EVID. 409.1.

Based on this goal, 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,[7] 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 more generally. Moreover, as in the case of other tort reforms, many apology laws are specifically limited to one arena that has traditionally been the focus of litigation reduction—medical malpractice.[8] Indeed, Yonathan Arbel and Yotam Kaplan recently concluded that "despite appearances, apology laws *are* de-facto tort reform."[9] Tracing the development of apology laws, these scholars explained 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 thereby] found a way into the hearts of legislators and the public."[10] 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.[11]

While apology laws represent a relatively recent revolution in the tort reform debate, they have gained acceptance in 38 states to date—outstripping many traditional reforms in popularity. These laws have even received attention at the federal level, with then-Senators Barrack Obama and Hillary Clinton introducing legislation that included a federal apology law.[12] As with the proposed federal law's state counterparts, the federal apology law was directed not at realizing the therapeutic benefits of apologies but as a way to reduce perceived high levels of medical malpractice litigation.[13]

Despite the significant uptake of apology laws among states, attention at the federal level, and the widespread interest in apologies as a litigation reduction strategy,[14] relatively little evidence exists on whether apology laws actually accomplish their goals 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

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[7] Formally, apology laws are reforms to state codes of evidence. *See, e.g.*, IOWA CODE ANN. § 622.31 (Reforming Iowa's evidentiary code).

[8] 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.").

[9] Yonathan Arbel & Yotam Kaplan, *Tort Reform through the Backdoor: A Critique of Law and Apologies*, 89 S. CAL. L. REV. 1199, 1201 (2017).

[10] *Id.* at 1200–01.

[11] *See* MICHELLE M. MELLO & ALLEN KACHALIA, MEDICAL MALPRACTICE: EVIDENCE ON REFORM ALTERNATIVES AND CLAIMS INVOLVING ELDERLY PATIENTS 90 (2016) (including apology laws among other tort reforms); *see also* Michelle M. Mello et al., *Medical Liability—Prospects for Federal Reform*, 376 N. ENG. J. MED (forthcoming 2017) (same).

[12] *See* Hillary Rodham Clinton & Barrack Obama, *Making Patient Safety the Centerpiece of Medical Liability Reform*, 354 N. ENGL. J. MED. 2205, 2206 (2006) (discussing their proposal).

[13] *Id.*

[14] An entire organization is dedicated to advocating in favor of increased apologies in the medical malpractice context. *See* SORRY WORKS!, sorryworks.net (last visited Jan. 2, 2018).

limited evidence exists on the effect of apology laws on liability."[15] To date, only two rigorous studies—both conducted by the same researchers—have examined the role of apology laws in litigation.[16] Because apology laws are overwhelmingly targeted at health care and medical malpractice, these studies specifically examined medical malpractice litigation. 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 increase this risk.[17] However, as the authors note, this evidence was derived from a publicly available dataset of malpractice claims that excludes relevant information on a number of malpractice claims, such as those that receive no payment.[18]

In this Article, we provide 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 does not exclude the information that publicly available databases do. Specifically, our dataset includes approximately 90% of all of the physicians practicing within a single specialty,[19] so we have the unprecedented ability to analyze nearly the universe of malpractice claims filed against an entire specialty over an eight-year period (2004–2011). Focusing on a specific specialty enables us to hold constant the general class of medical conditions that are involved rather than having a sample with physicians with diverse specialties, such as neurosurgeons and dermatologists, whose patients face quite different risks. We observe all of the claims filed against those physicians regardless of whether a claim resulted in a positive payment to the claimant or whether it resulted in a formal lawsuit being filed. Including all malpractice cases regardless of whether they resulted in a positive payment to a claimant is important because over half of all claims filed against physicians result in no payment.

Decomposing medical malpractice liability risk into the probability of a claim 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,

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[15] MELLO AND KACHALIA, *supra* note 11, at 92; *see also* Mello et al., *supra* note 11 (noting that "insufficient evidence" exists to evaluate the effects of apology laws).

[16] Ho & Liu, *Does Sorry Work*, *supra* note 8, at 141; Benjamin Ho and Elaine Liu, *What's an Apology Worth? Decomposing the Effect of Apologies on Medical Malpractice Payments Using State Apology Laws*, 8 J. EMPIRICAL L. STUD. 179 (2011) [hereinafter Ho & Liu, *What's an Apology Worth*].

[17] *Compare* Ho & Liu, *Does Sorry Work*, *supra* note 8, at 156 ("The results show a consistent 14–15% increase in
closed claim frequency with positive payouts."), *with* Ho & Liu, *What's an Apology Worth*, *supra* note 16, at 190 ("Physicians in states with apology laws would pay $35,000 per case less than physicians in states without apology laws on average.").

[18] *See, e.g.*, Ho & Liu, *Does Sorry Work*, *supra* note 8, at 153 ("Given that the [National Practitioner Data Bank] data set only consists of claims with positive payouts, it does not contain information on open claims nor closed claims without payments.").

[19] 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 Area Health Resource Files, which include data on the number of physicians practicing in different specialties.

apology laws do not reduce the likelihood that a physician faces a claim in a given year, but these laws boost the probability that a physician who is not rated for surgery is a party to a lawsuit to almost one and a half times the national average. Moreover, we find no evidence that apology laws decrease the average payment received by claimants from physicians. In fact, physicians who do not perform surgery see their average malpractice payment increase as a result of apology laws. Because apology laws do not decrease the frequency of lawsuits or the average payment for surgeons, but have the opposite effect for non-surgeons, 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, these findings are not consistent with case studies of physician apology and disclosure programs that have found that these programs encourage physician-patient communication, reduce payments, and decrease the number of suits.[20] However, the success of particular programs may be influenced in part by efforts that are undertaken in conjunction with apologies so that they do not isolate the impact of the use of apologies. These programs are often implemented at academic medical centers, which are likely not directly comparable to many physician practices, and typically involve training physicians (or others) how to effectively apologize to patients—training that does not accompany the passage of an apology law. Our results are also not entirely consistent with the limited empirical evidence on apology laws, which suggests that, while these laws may result in a short-term increase in the frequency of malpractice payments, apology laws decrease the average size of these payments.[21] However, 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 restraining medical malpractice liability, we make a series of recommendations to state legislatures and physicians who might contemplate using apologies. With respect to state legislatures, which have relied heavily on apology laws to reduce medical malpractice litigation, we argue that apology laws fail to achieve their stated goals. If the objective is to restrain medical malpractice costs, apology laws have a counterproductive effect. Accordingly, assuming that legislatures remain committed to the goal of reducing litigation, they should explore alternative means of achieving it. As to those directly affected by apologies—patients, physicians, and attorneys responsible for advising both—we propose that each set of actors should adopt a new strategy with respect to apologies. Unless the apologies are undertaken in conjunction with a training program that has demonstrated efficacy in reducing malpractice risk, physicians should avoid

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[20] 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).

[21] Ho & Liu, *Does Sorry Work*, *supra* note 8, 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."); Ho & Liu, *What's an Apology Worth*, *supra* note 16, at 190 ("Physicians in states with apology laws would pay $35,000 per case less than physicians in states without apology laws on average.").

apologizing, and attorneys should advise them accordingly. Patients who receive an apology should consider seeking out additional evidence to demonstrate physician negligence.

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

I. APOLOGY LAWS: JUSTIFICATION, FORM, AND FUNCTION

Between 1999 and 2011, the number of states with apology laws increased from two to 38.[22] Having outstripped many traditional tort reforms in popularity and covering over 71% of the US population in 2011, apology laws have become an important factor in the ongoing debate over medical malpractice liability, litigation reduction, and tort reform.[23] However, while they may be a new generation of tort reform,[24] apology laws are unlike any previous reforms, both in terms of how they function and how they became laws. This section 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."[25] Though apologies may be uncommon in the legal context, their therapeutic value has been well-documented. Psychological research has found that an apology from an offender to a victim can ease the victim's pain and assuage her anger almost instantaneously.[26] More specifically, an apology can allow a victim to release anger in a healthy manner, allow the victim to move through the grief process, and

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[22] Benjamin J. McMichael, *The Failure of "Sorry": An Empirical Evaluation of Apology Laws, Health Care, and Medical Malpractice*, 22 LEWIS & CLARK L. REV. 13 (forthcoming 2018). As discussed below, 33 of these states had apology laws and the remaining five had "full" apology laws.

[23] *Id*. at A9.

[24] Arbel and Kaplan, *supra* note 9; McMichael, *supra* note 22.

[25] Aaron Lazare, *The Healing Force of Apology in Medical Malpractice and Beyond*, 57 DEPAUL L. REV. 251, 255 (2008); *see also* Erin A. O'Hara & Douglas Yarn, *On Apology and Consilience*, 77 WASH. L. REV. 1121, 1130–31 (2002) ("[A]pologies are described generally as admissions of blameworthiness and regret for doing harm.").

[26] O'Hara & Yarn, *supra* note 25, at 1124; Ken'ichi Ohbuchi et al., *Apology as Aggression Control: Its Role in Mediating Appraisal of and Response to Harm*, 56 J. PERS. SOC. PSYCHOL. 219 (1989).

restore to the victim what was taken away by the offender.[27] When an offender apologizes, she both acknowledges her own fault and recognizes the victim's harm, thus restoring the victim's agency.[28] Additionally, an apology from the offender can reduce the victim's attribution of fault to the offender and shift this attribution to reasons for harm that were beyond the offender's control.[29] With respect to apologies in the context of medical malpractice, research has confirmed that apologies are particularly important because "so much is at stake," often including the patient's life or her ability to function, and because "time is precious."[30] 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.[31] 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 notes 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.[32]

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. Prior research has demonstrated that 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 person . . . attributes causation and fault to a third party [and] perceives that he or she has been treated unfairly."[33] By influencing these factors, apologies can "lead to greater willingness to settle claims and greater satisfaction with outcomes."[34]

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.[35] When asked to evaluate a settlement offer by a hypothetical landlord, "tenants" were marginally more likely to accept the

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[27] Susan Daicoff, *Apology, Forgiveness, Reconciliation & Therapeutic Jurisprudence*, 13 PEPP. DISP. RESOL. L.J. 131, 143–49 (2013).

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

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

[30] Aaron Lazare, *The Healing Force of Apology in Medical Malpractice and Beyond*, 57 DEPAUL L. REV. 251, 264 (2008).

[31] *Id*. at 263.

[32] NICHOLAS TAVUCHIS, MEA CULPA: A SOCIOLOGY OF APOLOGY 13 (1991); *see also* Barry R. Schlenker & Bruce W. Darby, *The Use of Apologies in Social Predicaments*, 44(3) SOCIAL PSYCHOLOGY QUARTERLY 271, 354 (1981) (explaining that the offender acknowledges the importance of the rule that has been broken by apologizing).

[33] Robbennolt, *supra* note 1, at 477.

[34] *Id*.

[35] Russell Korobkin & Chris Guthrie, *Psychological Barriers to Litigation Settlement: An Experimental Approach*, 93 MICH. L. REV. 107 (1994).

offer of settlement when the landlord apologized, saying, "I know this is not an acceptable excuse . . . but I have been under a great deal of pressure lately."[36]

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.[37] 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.[38] 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 were more uncertain about whether to accept the settlement offer.[39] 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."[40] 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 and by altering the values of the injured parties' settlement levers in ways that are likely to increase the chances of settlement."[41] As in her previous work, 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.[42]

Experimental studies focusing specifically on healthcare and medical malpractice have reported similar findings. For example, Kathleen Mazor and others examined patients' responses to medical errors in an experimental setting.[43] Members of a health care plan were provided with hypothetical descriptions of a medical error and the physician's response to that error.[44] 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.[45] When the physician took responsibility, participants reported

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[36] *Id*.
[37] Robbennolt, *supra* note 1, at 485–90.
[38] *Id*. at 485–500.
[39] *Id*. at 497.
[40] These "settlement levers" include "reservation, aspirations, and judgments of fair settlement amounts." Robbennolt, *supra* note 3, at 333, 343–49.
[41] *Id*. at 367–68; *see also id*. at 358–67 (describing the results of the experiments in detail).
[42] *Id*. at 359.
[43] Kathleen M. Mazor et al., *Health Plan Members' Views about Disclosure of Medical Errors*, 140 ANNALS OF INTERNAL MED. 409 (2004) [hereinafter Mazor et al., *Disclsoure*]; *see also* Kathleen M. Mazor et al., *Health plan members' views on forgiving medical errors*, 11 AM. J. MANAGED CARE 49, 50–51 (2005).
[44] Mazor et al., *Disclosure*, *supra* note 43, at 409–11.
[45] *Id*.

that they would be less likely to seek legal advice.[46] Moreover, in the event of an error, participants overwhelmingly reported that they would prefer that the physician apologize.[47] Similarly, Amy Witman and several colleagues concluded from an experimental study that patients were more likely to pursue a claim against their physicians following a medical error if the physician failed to acknowledge the error.[48] Charles Vincent and his colleagues found that over one-third of the people they surveyed would not have sued their physician after a medical error if they had received an apology and explanation.[49]

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 his colleagues.[50] 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.[51] Indeed, the Hickson group 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.[52] 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—instead of the second group, which is arguably where traditional tort reform is focused in its attempt 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 VA hospital saw financial savings as a result of implementing the program.[53] Similarly, Carol Liebman and Chris Hyman explained that open communication played an important role in reducing the incidence of medical malpractice claims in Pennsylvania hospitals.[54]

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[46] *Id*.
[47] *Id.* at 415.
[48] 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); *see also* Marlynn L. May & Daniel B. Stengel, *Who Sues Their Doctors? How Patients Handle Medical Grievances*, 24 L. & SOC'Y REV. 105 (1990) (reporting similar findings).
[49] Charles Vincent et al., *Why Do People Sue Doctors? A Study of Patients and Relatives Taking Legal Action*, 343 LANCET 1609, 1612 (1994).
[50] Hickson et al., *supra* note 3, at 1361.
[51] *Id*.
[52] *Id*.
[53] Steve S. Kraman & Ginny Hamm, *Risk Management: Extreme Honesty May be the Best Policy*, 131 ANNALS OF INTERNAL MEDICINE 963.
[54] Carol B. Liebman & Chris Stern Hyman, *Medical error disclosure, mediation skills, and malpractice litigation: A demonstration project in Pennsylvania* 7 (2005) (unpublished manuscript), http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.596.1143&rep=rep1&type=pdf; *see also*

The most extensive studies of hospital-specific apology and disclosure programs have taken place at the University of Michigan Health Service. Allen Kachalia and his colleagues found that, following the introduction of the program at Michigan, demands for compensation fell by one-third and the number of lawsuits fell by two-thirds.[55] Studying the compensation paid out to claimants before and after the implementation of the program at Michigan, the researchers found that the hospital saved almost 60% in compensation costs and that mean lawsuit costs fell by nearly 45%.[56] Richard Boothman and colleagues examined the same program and found that per claim payments were cut nearly in half and that the average time it took to settle a claim decreased from two years to six months.[57] Focusing on claims specific to gastroenterology, Megan Adams and other researchers found, consistent with earlier work, that the average payment per claim and time to resolution decreased.[58] 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.[59]

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—not just at specific hospitals—turned to apologies as a strategy to accomplish this goal. However, the implementation of "apologies as malpractice mitigation" at the state level has been quite different than the implementation at the hospital level, often in conjunction with strategies to foster the efficacy of the apology. Based in part on the favorable reports on the impact of apologies on medical malpractice risk, states have turned to apology laws as the vehicle by which to facilitate apologies from physicians to patients. The next section 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 example, the author of the bill containing California's apology law "introduced th[at] bill in an attempt to reduce lawsuits and encourage settlements by fostering the use of apologies."[60] The authors of Tennessee's apology law explicitly included the mechanism by which they expected the law to work, stating that "[t]he underlying

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Carol B. Liebman & Chris Stern Hyman, *A mediation skills model to manage disclosure of errors and adverse events to patients*, 23 HEALTH AFF. 22, 22-26 (2004).

[55] Kachalia et al., *supra* note 20, at 215.

[56] *Id*.

[57] Richard C. Boothman et al., *A better approach to medical malpractice claims?: the University of Michigan experience*, 2 J. HEALTH LIFE SCI. L. 125 (2009).

[58] 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 (2014).

[59] *Id*.

[60] California Assembly Comm. on Judiciary, *Historical Notes to Cal. Evid. Code* § 1160.

theory of [Tennessee's 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."[61]

The mechanism by which apology laws, in theory, accomplish their goals is relatively simple. Apology laws encourage physicians to apologize, physicians apologize to patients, patient anger is assuaged, and patients file fewer claims and more readily settle those claims that are filed. Apology laws are designed to accomplish the first step of encouraging physician apologies by reducing or eliminating the risk of apologizing, i.e., that the apology could be used against the physician in a determination of liability. Formally, apology laws are reforms to state codes of evidence, and they reduce the risk of apologizing by prohibiting the introduction of statements of sympathy, condolence, or apology into evidence at a subsequent malpractice trial.[62] These laws are necessary because, without them, statements of apology made by physicians to patients would be admissible as an admission of a party opponent.[63]

While all apology laws rely on the theory that physicians will apologize more when those apologies are privileged from admission into evidence and that these apologies will decrease medical malpractice litigation, there are two different types of apology laws that operate slightly differently.[64] The first type—what have been called "partial apology laws"—protect only statements of apology, condolence, sympathy, and the like.[65] The second type—what have been called "full apology laws"—protect all such statements but further protect statements of fault, error, or liability.[66] In this Article, we focus on "partial apology laws," which we call apology laws for the sake of succinctness, for three important reasons. First, these laws are substantially more popular than their "full" cousins, with 33 states currently having apology laws on the books to only 5 states with full apology laws. 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 over an eight-year period.[67] Third, full apology laws provide broader protections

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[61] TENN. R. EVID. 409.1.

[62] *See, e.g.*, VA. CODE ANN. § 8.01-581.20:1 ("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").

[63] *See, e.g.*, TENN. R. EVID. 409.1 ("The underlying theory of Rule 409.1 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.").

[64] *See* Ho & Liu, *Does Sorry Work*, *supra* note 8, at 145 (using the same terminology); *see also* McMichael, *supra* note 22 (same).

[65] *See, e.g.*, OR. REV. STAT. ANN. § 677.082.

[66] *See, e.g.*, GA. CODE ANN. § 24-4-416.

[67] We do not combine apology and "full" apology laws into one broad category, as prior work has done, because we find statistically significant evidence that apology and admission laws do not have

that include not only the apology but also other statements such as those pertaining to liability.

Table 1: State Apology Laws

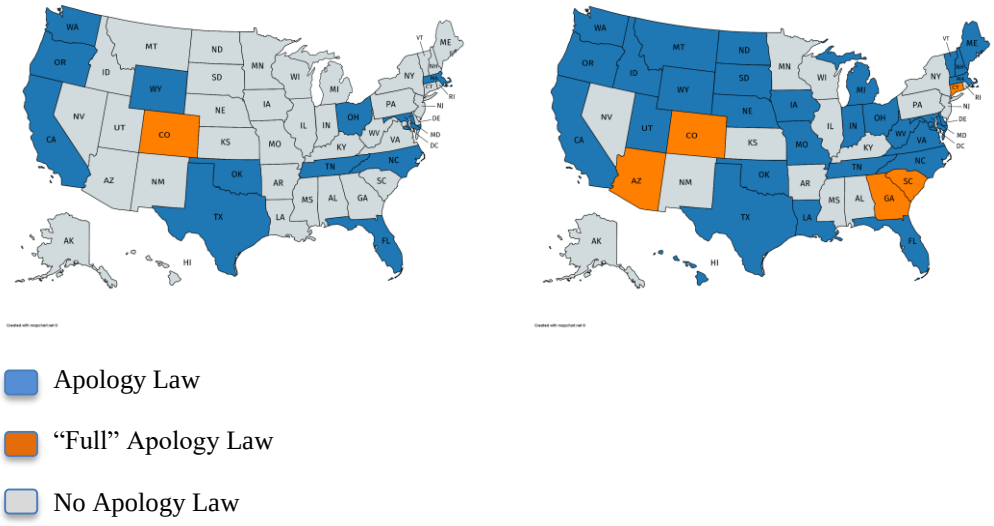
State	Year	Citation
Massachusetts	1986	MASS. GEN. LAWS ANN. CH. 233, § 23D
Texas	1999	TEX. CIV. PRAC. & REM. CODE ANN. § 18.061
California	2000	CAL. EVID. CODE § 1160
Florida	2001	FLA. STAT. ANN. § 90.4026
Washington	2002	WASH. REV. CODE ANN. § 5.66.010
Tennessee	2003	TENN. R. EVID. 409.1
Oregon	2003	OR. REV. STAT. ANN. § 677.082
Maryland	2004	MD. CODE ANN., CTS. & JUD. PROC. § 10-920
North Carolina	2004	N.C. GEN. STAT. ANN. 8C-1, 413
Ohio	2004	OHIO REV. CODE ANN. § 2317.43
Oklahoma	2004	OKLA. STAT. ANN. TIT. 63, § 1-1708.1H
Wyoming	2004	WYO. STAT. ANN. § 1-1-130
Louisiana	2005	LA. STAT. ANN. § 13:3715.5
Maine	2005	ME. REV. STAT. TIT. 24, § 2907
Missouri	2005	MO. ANN. STAT. § 538.229
New Hampshire	2005	N.H. REV. STAT. ANN. § 507-E:4
South Dakota	2005	S.D. CODIFIED LAWS § 19-19-411.1
Virginia	2005	VA. CODE ANN. § 8.01-581.20:1
Illinois	2005	735 ILL. COMP. STAT. ANN. 5/8-1901
Montana	2005	MONT. CODE ANN. § 26-1-814
West Virginia	2005	W. VA. CODE ANN. § 55-7-11A
Delaware	2006	DEL. CODE ANN. TIT. 10, § 4318
Idaho	2006	IDAHO CODE ANN. § 9-207
Indiana	2006	IND. CODE ANN. § 34-43.5-1-1 ET SEQ.
Iowa	2006	IOWA CODE ANN. § 622.31
Utah	2006	UTAH R. EVID. 409
Vermont	2006	VT. STAT. ANN. TIT. 12, § 1912
Hawaii	2006	HAW. REV. STAT. ANN. § 626-1, RULE 409.5
Nebraska	2007	NEB. REV. STAT. ANN. § 27-1201
North Dakota	2007	N.D. CENT. CODE ANN. § 31-04-12
District of Columbia	2007	D.C. CODE ANN. § 16-2841
Michigan	2011	MICH. COMP. LAWS ANN. § 600.2155
Pennsylvania	2013	35 PA STAT. ANN. § 10228.3

the same or similar effects on malpractice risk. *See* Ho & Liu, *Does Sorry Work*, *supra* note 8 (using a single apology law category).

Table 1 provides a comprehensive overview of states' adoptions of apology laws, and Figure 1 provides an overview of changes in state apology laws between 2004 and 2011—the beginning and end of our data period, respectively. Massachusetts led the way with the nation's first apology law in 1986, and Texas followed suit thirteen years later in 1999. The fact that these two 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.[68] By 2004, which marks the beginning of the period covered by our data, twelve states had enacted apology laws, and between 2004 and 2011, nineteen additional states and the District of Columbia enacted apology laws.[69] Thus, the time period over which our analysis occurs includes substantial variation in state apology laws, with nineteen states plus the District of Columbia "switching" from no law to having an apology law. Figure 1 further demonstrates that adoption of apology laws is not concentrated in one area of the country or among predominantly urban or rural states.

Figure 1: Apology Laws Over Time

2004 **2011**



Overall, apology laws have quickly become one of the most popular tort reforms across the country. However, they function sufficiently differently from other tort reforms that caution should be exercised when extrapolating the effect of the former from the latter. The next section discusses how apology laws can work in practice and how this differs from other tort reforms.

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

The mechanism by which traditional tort reforms accomplish their goals of reducing medical malpractice liability risk is straightforward. These reforms alter

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[68] Ho & Liu, *Does Sorry Work*, *supra* note 8, at 144.

[69] Illinois enacted an apology law in 2005 and repealed it in 2010. It is the only state that has repealed an apology law.

how courts may award damages in ways that benefit defendants. For example, caps on noneconomic damages simply restrict courts from awarding damages over the cap amount.[70] Joint and several liability reform alters the ways in which courts may apportion damages following a determination of liability.[71] These traditional reforms have received substantial attention from scholars, and research has demonstrated that they have the potential to impact the medical malpractice litigation environment.[72] W. Kip Viscusi, Patricia Born, and Tom Baker show in a series of studies that tort reforms reduce malpractice insurance losses, premiums, and loss ratios.[73] Several systematic reviews of the evidence on tort reform have concluded that, while some reforms have an effect on medical malpractice litigation, noneconomic damages caps have the most consistent effect.[74] Most relevant to this Article, Ronen Avraham examined a large sample of medical malpractice payments contained in the National Practitioner Data Bank. He found that noneconomic damages caps decrease the number of payments made to resolve malpractice disputes and reduce the size of those payments.[75]

While a substantial amount of evidence on traditional tort reforms suggests that some of these reforms can reduce the size and frequency of payments made to resolve medical malpractice claims, 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 than other, more familiar tort reforms. In contrast to reforms such as damages caps which require only an action by the court, apology laws require actions both by the court—excluding an apology from evidence—and by the 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 by apologizing to benefit from apology laws. Depending on how patients receive this apology, 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.

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[70] *See* Ronen Avraham, *An Empirical Study of the Impact of Tort Reforms on Medical Malpractice Settlement Payments*, 36 J.L. STUD. S183, S186 (2007) (exploring the effect of noneconomic damages caps on malpractice litigation).

[71] *Id*.

[72] *See* MELLO & KACHALIA, *supra* note 11, at 1-90 (discussing the available evidence on tort reforms).

[73] Patricia Born et al., *The Effects of Tort Reform on Medical Malpractice Insurers' Ultimate Losses*, 76 J. RISK & INS. 197 (2009) (finding that noneconomic damages caps reduce medical malpractice losses and increase the profitability of medical malpractice insurers); W. Kip Viscusi & Patricia H. Born, *Damages Caps, Insureability, and the Performance of Medical Malpractice Insurance*, 72 J. RISK & INS. 23 (2005) (finding that insurers pass some of the savings from lower malpractice liability payments on to physicians).

[74] MELLO & KACHALIA, *supra* note 11; CONGRESSIONAL BUDGET OFFICE, The Effects of Torts Reform: Evidence from the States (2004), https://www.cbo.gov/sites/default/files/108th-congress-2003-2004/reports/report_2.pdf; OFFICE OF THE TECHNOLOGY ASSESSMENT, IMPACT OF LEGAL REFORMS ON MEDICAL MALPRACTICE COSTS (1993).

[75] *See* Avraham, *supra* note 70 (finding 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 L. STUD. 69, 69 (2007) (finding noneconomic damages caps do not reduce medical malpractice liability risk).

In general, the physician-patient relationship with respect to malpractice may be characterized in one of two ways.[76] First, the relationship may be one of full information so that, when malpractice occurs, both the physician and patient are fully aware that is has occurred. For example, if a physician amputates the wrong limb or leaves a sponge in the patient's chest cavity, there will be little doubt in either the patient's or physician's mind that malpractice has occurred. Second, the physician-patient relationship may be characterized by asymmetric information so that, when malpractice occurs, the physician is aware of its occurrence while the patient is not. For example, if the physician misdiagnosis the medical condition, the patient, lacking any medical knowledge, will have little ability to discover this error. These two characterizations of the physician-patient relationship give rise to three competing theories that explain how apology laws may affect malpractice litigation.[77]

First, apology laws can work as legislators intend to reduce the probability of litigation and decrease payment amounts. If a patient and physician possess the same information, i.e., they know when the patient's injury stems from the physician's malpractice and not some other cause (such as the underlying illness), then an apology can assuage the patient's anger, discourage her from filing a lawsuit, encourage her to accept a lower settlement amount, and encourage her to accept a settlement more quickly.[78] This is, in fact, exactly how apology laws are designed to work,[79] and states appear to have implicitly assumed that the physician-patient relationship is characterized by full information when passing apology laws.

Second, if the physician knows more about whether malpractice has occurred, apology laws may increase the frequency of apologies and either increase or decrease both the probability of a malpractice dispute and the size of the ultimate payment.[80] For example, when the physician possesses private information about whether the patient's injury was the result of malpractice, an apology may alert the patient to malpractice she would not otherwise have discovered or embolden the patient in her conclusion that malpractice has occurred when she would have otherwise been unsure.[81] 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

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[76] The discussion that follows is essentially a summary of the mathematical models developed by Benjamin Ho and Elaine Liu. Ho & Liu, *Does Sorry Work*, *supra* note 8, at 150; Benjamin Ho, *Apologies as Signals: With Evidence from a Trust Game*, 58 MGMT. SCI. 141, 142–43 (2012).

[77] For a complete development of the mathematical models that underlie these theories, see Ho & Liu, *Does Sorry Work*, *supra* note 8, at 150.

[78] *Id*.

[79] *See supra* Part I.B.

[80] *Id*.

[81] 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. Sandra G. Boodman, *Should Hospitals—and Doctors—Apologize for Medical Mistakes*, WASH. POST (March 12, 2017), https://www.washingtonpost.com/national/health-science/should-hospitals--and-doctors--apologize-for-medical-mistakes/2017/03/10/1cad035a-fd20-11e6-8f41-ea6ed597e4ca_story.html?utm_term=.6ffb6f748305 (noting that "[m]ost patients never learn they are victims of a medical error").

as evidence, the apology may alert patients to potential malpractice and encourage them to seek other (admissible) evidence.

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 apologies can decrease patients' desire to sue their physicians as discussed above.[82] 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.[83]

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.[84] Using data from the publicly available National Practitioner Data Bank, Ho and Liu find somewhat conflicting results.[85] They find that apology laws increase the frequency of malpractice claims but that this increase dissipates over time.[86] On the other hand, they also find that, consistent with their intended effects, apology laws reduce the delay between a malpractice event and the resolution of a claim.[87] Further, apology laws decrease the average payment per claim, especially for claims involving more severe injuries.[88] Ho and Liu extend their earlier analysis to find 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.[89]

Beyond the litigation realm, the effect of apology laws is clearer, though this evidence contradicts the evidence on hospital-specific apology and disclosure programs. Examining the effect of apology laws on the treatment decisions of physicians caring for cardiac patients, Benjamin McMichael finds evidence that physicians increase the resources used to treat these patients.[90] This increase in

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[82] Thomas H. Gallagher et al., *Patients' and Physicians' Attitudes Regarding the Disclosure of Medical Errors*, 289 JAMA 1001, 1002 (2003); Charles Vincent et al., *Why Do People Sue Doctors? A Study of Patients and Relatives Taking Legal Action*, 343 LANCET 1609, 1612 (1994); 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 OF INTERNAL MED. 2565, 2566 (1996); Marlynn L. May & Daniel B. Stengel, *Who Sues Their Doctors? How Patients Handle Medical Grievances*, 24 L. & SOC'Y REV. 105 (1990).

[83] Boothman et al., *supra* note 57; Adams et al., *supra* note 58; Kachalia et al., *supra* note 20.

[84] Ho & Liu, *What's an Apology Worth*, *supra* note 16; Ho & Liu, *Does Sorry Work*, *supra* note 8.

[85] Ho & Liu, *Does Sorry Work*, *supra* note 8.

[86] *Id*. at 156–59.

[87] *Id*. at 159–62.

[88] *Id*.

[89] Ho & Liu, *What's an Apology Worth*, *supra* note 16.

[90] McMichael, *supra* note 22.

resource use is consistent with physicians responding to an increase in their malpractice liability risk.[91]

Overall, 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 have unintended effects. To do so, we exploit both the completeness of and unique information provided by our dataset. That dataset and the malpractice litigation context in which our empirical analysis occurs is discussed in the next section.

II. LITIGATION DATA

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 US physicians practicing in a single specialty from 2004 through 2014.[92] In other words, our data represent nearly a complete census of all physicians practicing within this specialty. 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. Non-suit claims involve patient demands for compensation that are resolved prior to the filing of a lawsuit. The other category of claims involves lawsuits in which there is a demand for compensation and the filing of a formal legal complaint in court. 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 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 the injury occurred. While the data cover 2004 through 2014, we limit our analysis to claims from 2004 through 2011. Statutes of limitation for medical malpractice actions vary across states, but two to three years is common. Excluding cases where the injury occurred after 2011 addresses the concern that later years do not include all instances of malpractice because claimants still have time to file a claim within the statute of limitations.[93] Our final sample includes nearly 75,000 physician-years.

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

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[91] *Id.*

[92] For confidentiality reasons, we are not able to disclose either the insurer or the specialty.

[93] 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.

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. 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.

In general, the dataset we analyze represents the gold standard of litigation data for three reasons. First, the data include information on claims that resulted in no payment to the claimant. Thus, we observe medical malpractice cases that are never reported to the National Practitioner Data Bank, which was used in previous studies of apology laws.[94] The inclusion of zero and non-zero payments provides a comprehensive picture of the medical malpractice landscape, as cases that result in no payment to claimants nevertheless impose direct costs in the form of ALAE (and attendant higher premium rates for physicians) and indirect costs in the form of time away from medical practices and potential harm to physicians' reputations.[95] 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 by censored data that include information only on litigants that chose not to settle their claims. Finally, our dataset is not subject to the reporting loopholes that have been well documented in publicly available datasets.[96]

To supplement the malpractice insurance data, we collected information on state apology laws for all 50 states and the District of Columbia. While we do not have information on whether the physician made an apology, we do have information on the physician's state that can be used to construct a variable for the presence of an apology law.[97] We examined the relevant statutory language and classified each state as having an apology law, a "full" apology law, or no law. As reported in Table 1, 33 states and the District of Columbia have enacted apology laws (and five additional states have enacted "full" apology laws). To control for the differences in treatment intensity across the country that have been well documented by the Dartmouth Atlas of Health Care and the Health Care Cost

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[94] *See, e.g.*, Ho & Liu, *Does Sorry Work*, *supra* note 8; How & Liu, *What's an Apology Worth, supra* note 16.

[95] *See, e.g.*, 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.

[96] *See* Amitabh Chandra et al., *The Growth of Physician Medical Malpractice Payments: Evidence from the National Practitioner Data Bank*, 2005 HEALTH AFF. W2, https://sites.hks.harvard.edu/fs/achandr/HA_PhysicianMalpracticeNatlPractitionerData_2005.pdf, (discussing reporting loopholes for the National Practitioner Data Bank).

[97] To be clear, no study of apology laws has ever been able to examine whether an apology was actually delivered. *See, e.g.*, Ho & Liu, *Does Sorry Work*, *supra* note 8; McMichael, *supra* note 22. Gathering this information would require data collection in the hospital room where an apology would be delivered following a medical error. For reasons of both privacy and difficulty in collecting such data across all physicians in every state, information on the delivery of apologies is not available. Even studies on hospital-specific apology and disclosure programs must make the empirical assumption that physicians delivered an apology as required by the program. Moreover, the relevant policy we analyze here is 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.

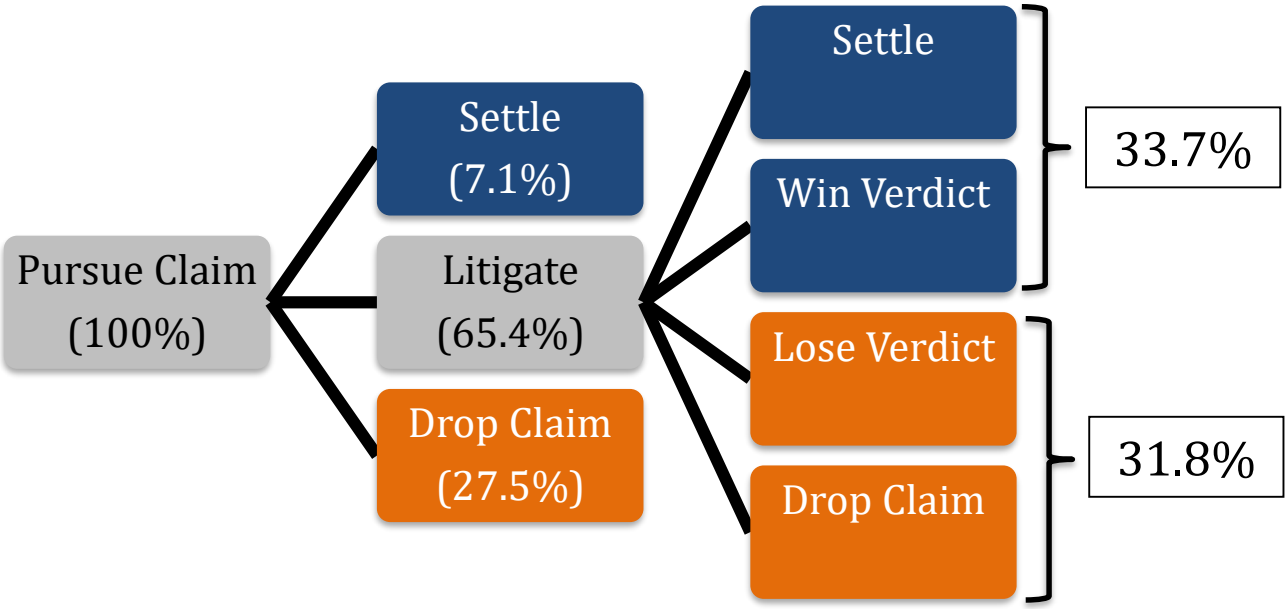
Institute,[98] we obtained information on healthcare infrastructure and population demographics from the Area Health Resource Files. We collected information on the number of operating rooms per capita and the number of surgical operations per capita. We also collected population information at the state level, including the percentage of the population that identifies as white, black, and Hispanic; the percentage of the population over 65; the unemployment rate; the poverty rate; median household income; and population density.

B. Suing Physicians

Once a patient decides to pursue a claim, she notifies the physician of her claim, and the physician notifies the malpractice insurer. At this point, the claim becomes observable in our dataset, and Figure 2 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. Orange cells represent outcomes in which the claimant receives no payment, blue cells represent outcomes in which the claimant receives a payment, and gray cells indicate situations in which the payment outcome has not yet been determined.

[98] *See Understanding of the Efficiency and Effectiveness of the Health Care System*, THE DARTMOUTH ATLAS OF HEALTH CARE, http://www.dartmouthatlas.org/; Per Capita Health Care Spending on Diabetes: 2009-2013, Health Care Cost Institute (2015), http://www.healthcostinstitute.org/files/HCCI%20Diabetes%20Issue%20Brief%205-7-15.pdf.

Figure 2: Medical Malpractice Litigation Outcomes



Note: A total of 3,417 claims were filed between 2004 and 2011. Each percentage represents the percentage of all claims that resulted in a particular outcome. Blue cells represent outcomes where a patient received a positive payment. Orange cells represent outcomes where a patient received no payment. Gray 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 that 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 without a lawsuit being filed. Only 7.1% of claims are settled with a positive payment prior to a lawsuit being filed. 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 for some amount. 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 non-payments as 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 section details our empirical analysis of apology laws, and that analysis does elucidate the effect of apology laws.

III. EMPIRICAL ANALYSIS

Based on the unique 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 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, and 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.[99] If physicians and patients possess full information, apology laws can facilitate apologies, which can in turn assuage anger and decrease patients' propensity to sue.[100] If physicians possess private information, apology laws can facilitate apologies which serve as signals of malpractice, bolstering patients' beliefs that a claim is likely to be successful and encouraging them to file more claims. In our empirical analysis of apology laws, we cannot directly observe the presence of asymmetric information.[101] However, throughout our analysis, we differentiate between physicians rated for surgery and physicians not rated for surgery.

Asymmetric information is more likely to be present in malpractice claims involving non-surgeons than those involving surgeons. Surgeons generally interact with and treat patients in a discrete event, i.e., the surgery they are performing plus any pre-operative and post-operative 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, non-surgeons generally treat their patients over the course of years or may interact with patients a number of times when attempting to resolve an injury or illness. Thus, observing the malpractice of non-surgeon physicians may be more difficult. For example, if a physician fails to refer a patient for specialty or sub-specialty care or improperly diagnosis the patient—two common bases for malpractice actions against non-surgeons—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 across surgeons and non-surgeons, we exploit the difference between these types of physicians in our empirical analysis and estimate whether apology laws affect surgeons and non-surgeons differently.

Returning to the three competing theories of apology laws discussed above, these generate three testable hypotheses. The "intended effects" hypothesis, which implicitly relies on the absence of asymmetric information, predicts that apology

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[99] Ho & Liu, *Does Sorry Work*, *supra* note 8.
[100] *Id*.
[101] *Id*.

laws will reduce both the frequency and size of malpractice claims. If this hypothesis is correct, then we should estimate a negative effect of apology laws on the size and frequency of claims, with no differential effect between surgeons and non-surgeons. 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 and that this increase will be larger for non-surgeons since the problem of asymmetric information is more acute for these physicians. Finally, the "no effects" hypothesis predicts that apology laws will have no effect on either surgeons or non-surgeons.

In this study, we do not observe whether apology laws increase apologies by physicians. However, we assume, consistent with prior work based on large datasets, that these laws do, in fact, facilitate apologies.[102] 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—the state which most recently passed an apology law—issued a press release announcing the passage of the state's new apology law almost immediately after the law was passed.[103] Additionally, the passage of this law was covered by popular press outlets.[104] 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 Ho and Liu,[105] 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 Ho and Liu identify as being the result of the well-documented shortcomings of the National Practitioner Data Bank.[106] First, that dataset includes only positive payments made to patients. Thus, if a patient drops her claim before receiving a payment or loses in court, the National Practitioner Data Bank does not include this case. Analysis of our data indicates that excluding claims that involved no payment to a claimant results in excluding over half of all malpractice claims. The absence of cases involving no payment prevents Ho and Liu from examining the probability a physician is a party to a malpractice case and the legal costs associated with it.[107] Second, while the National Practitioner Data Bank 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

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[102] *See* Ho & Liu, *Does Sorry Work*, *supra* note 8, 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.").

[103] Press Release, Pennsylvania Medical Society, Lawyers and Doctors come together and Agree It's Ok to Say "I'm sorry", (Oct. 23, 2013), https://www.pamedsoc.org/about-pamed/news-room/Apology%20Signing.

[104] Andis Robeznieks, *New Pa. law encourages doc apologies*, MODERN HEALTHCARE (Oct. 23, 2013), www.modernhealthcare.com/article/20131023/MODERNPHYSICIAN/310239974.

[105] Ho & Liu, *Does Sorry Work*, *supra* note 8; Ho & Liu, *What's an Apology Worth*, *supra* note 16.

[106] Ho & Liu, *Does Sorry Work*, *supra* note 8.

[107] *Id.*; Ho & Liu, *What's an Apology Worth*, *supra* note 16.

requirements.[108] Third, unlike our dataset, the National Practitioner Data Bank does not include actual payments made to plaintiffs. Instead, it reports only ranges into which a given payment falls (e.g., between $5,000 and $10,000). Finally, while the National Practitioner Data Bank includes information on the nature of a patient's injury, it does not indicate the physician's specialty.[109] Our data contain only one specialty, which limits the confounding effects of examining many specialties at once. Nor does the National Practitioner Data Bank indicate whether the insured physician is rated for surgery, which we will find to be a key physician characteristic.

Examining insurer data, we are able to extend the analysis of Ho and Liu to directly examine the probability a physician faces a malpractice claim. We are also able to estimate the probability that a given claim results in a lawsuit. Based on payment information contained in our data, we are able to estimate the effect of apology laws on the actual payments 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 and build upon their earlier analyses.

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 (protected by apology laws) and control (unprotected) groups 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 rely on a laboratory experiment, 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 potential confounding factors as possible in order to isolate the effect of apology laws.

The fact that some states passed apology laws while others did not provides readily available treatment (physicians in states with apology laws) and control (physicians in states without apology laws) groups. However, while the staggered

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[108] Chandra et al., *supra* note 96.

[109] *But see* David M. Studdert et al., *Prevalence and Characteristics of Physicians Prone to Malpractice Claims*. 374 N. ENG. J. MED. 354, 356 (2016) (noting that specialty information is available on a very limited basis by special permission).

passage of apology laws across different states provides useful "treatment" and "control" groups, the passage of these apology laws is almost certainly not random; 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 comparing physicians in states that passed these laws 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 for many different reasons. It would not be possible to disentangle the impact of all of these factors—many of which are hidden from even the best data sources—from the impact of apology laws on malpractice litigation. Another way to analyze apology laws involves comparing litigation outcomes in states with these laws to outcomes in states without these laws. However, this approach, too, would not yield evidence of a causal relationship because states with and without apology laws vary on many other dimensions (e.g., different judiciaries, different hospital regulations, different health care norms, etc.) that would confound any estimate of the effect of apology laws.

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 an apology law may also differ systematically in other ways from the group of physicians who are not subject to an apology law. 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. 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." 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.

As a hypothetical example, consider Kentucky and West Virginia. West Virginia's apology law became effective in 2005, 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. Suppose that the numbers of malpractice claims per 100 physicians in Kentucky and West Virginia in 2004 are 5 and 10, respectively. In 2005, these rates are 25 and 20, respectively. A simple before and after comparison in West Virginia would suggest that apology laws were responsible for an increase of 10 claims. 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. However, neither of these calculations isolates the effect of apology laws. To do that, we would calculate a simple difference in differences. First, we 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 and those factors that change over time, it isolates the role of apology laws in malpractice litigation. When estimating our primary empirical models, we 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. Though our primary models are more complex, the hypothetical example here illustrates the essence of the models discussed below.

Throughout our analysis, we estimate ordinary least squares ("OLS") regression models.[110] Our analysis of the effect 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 faces 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 non-suit claim, and (3) a lawsuit.[111] We then we extend this analysis to consider the probability that, conditional on a claim being asserted, different litigation outcomes occur. In these models, the dependent variable is an indicator for: (1) whether a claim eventually 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 lawsuit.

In the second phase of our analysis, we examine the effect of apology laws on the magnitude (severity) of malpractice payments. The dependent variable in these models is the natural logarithm of different measures of litigation costs.[112] We begin by examining indemnity costs, which simply represents the amount of money paid by the insurer to the claimant to resolve the claim. We then examine ALAE, which is effectively the cost to the insurer for defending the claim. Finally, we examine total costs—the sum of indemnity costs and ALAE.

In both parts of our analysis, the independent variables of interest are an indicator that takes the value one 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 non-surgeons differently, which in turn allows us to test whether asymmetric information plays a role in how apology laws work. In addition to the apology law and surgeon variables, the empirical models include a series of control variables to account for other factors that may influence the

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[110] The full specifications of each of our models as well as detailed results from these regression models are available in the Technical Appendix.

[111] An indicator variable equals one if the specified outcome occurred and zero otherwise. Dependent variables of this type allow us to examine the probability of a specified outcome occurring, and models with this structure are generally referred to as linear probability models.

[112] All of the litigation cost variables exhibit substantial right skews. It is standard practice in the literature to take the natural logarithm of a variable to transform it from a skewed distribution to a more normal distribution. *See, e.g.*, Michael Frakes, *The Surprising Relevance of Medical Malpractice Law*, 82 CHI. L. REV. 317, 368 (2015); *see also* Shahar Dillbary et al., *Regulatory Avoidance and Suicide: An Empirical Analysis*, 92 IND. L.J. 24, 26–27 n.124 (forthcoming 2018).

outcomes of interest. We include control variables for all of the health care infrastructure and population demographics discussed above.[113] We also include an indicator variable to control for whether a state had enacted a noneconomic damages cap,[114] and we include the number of specialist physicians practicing in the state. In the models that include only malpractice claims that were actually asserted, we further include controls for the type of injury suffered by the claimant.[115] 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.

C. Results and Discussion

1. The Effect of Apology Laws on Claim Probabilities

Table 2 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 for the apology law and no apology law regimes. On average, about 1.4% of physicians have claims filed against them each year that never involve lawsuits, i.e., non-suit claims. About 2.6% of physicians have lawsuits filed against them each year. Fewer non-suit claims are filed in states without apology laws, and fewer lawsuits are 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 of a physician facing any malpractice claim, facing a non-suit claim, and facing a lawsuit. These models include 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 effects of apology laws here.[116]

Table 2: Summary Statistics for the Number of Malpractice Disputes

	All Claims		Non-suit Claims		Lawsuits	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
All	0.040	0.197	0.014	0.118	0.026	0.160
Apology Law	0.041	0.198	0.018	0.133	0.023	0.149
No Apology Law	0.040	0.195	0.008	0.087	0.032	0.176

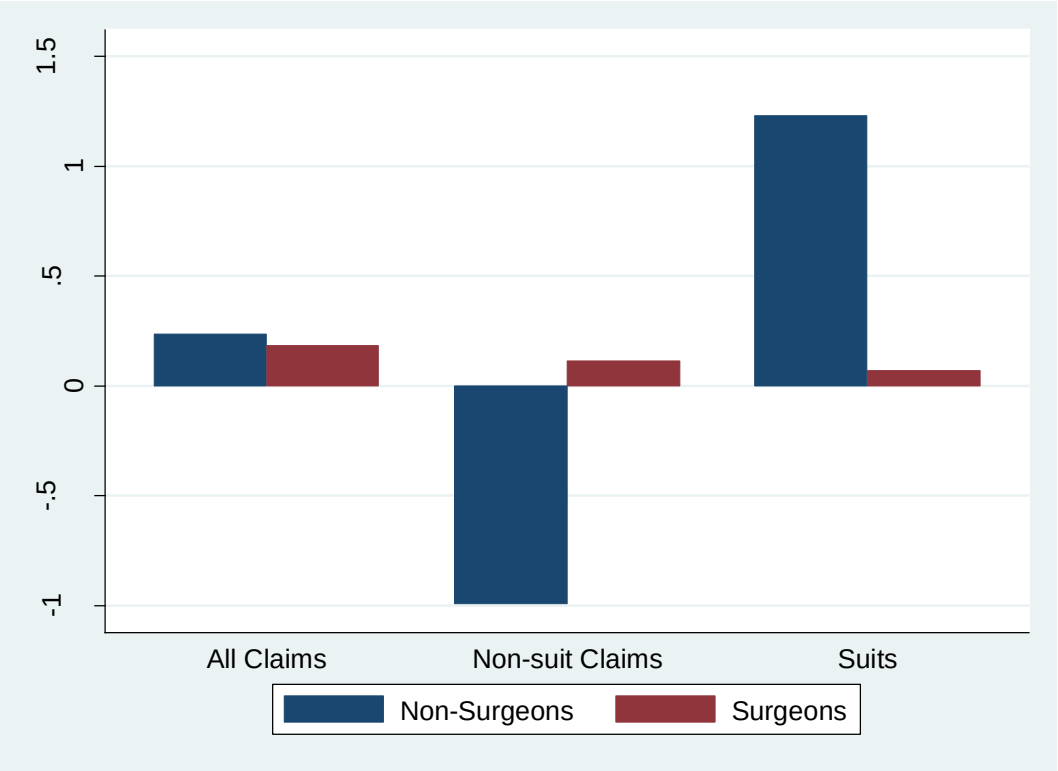
Notes: The mean represents the average number of physicians who experience a given malpractice dispute each year.

[113] *See supra* Part II.A.
[114] We do not include controls for other tort reforms, and this is discussed further in the Technical Appendix.
[115] This is discussed in detail in the Technical Appendix.
[116] Full regression results are available in the Technical Appendix.

Figure 3 reports the effects of apology laws on the probability of facing different types of malpractice claims, including any type of claim, a non-suit 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 non-surgeons and surgeons. In general, apology laws have little effect on the probability that physicians face any type of malpractice claim.[117] Moreover, surgeons see little change in their likelihood of facing either non-suit claims or lawsuits as a result of apology laws. Non-surgeons, 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 non-suit claim by 1 percentage point for non-surgeons, which is substantial given that only about 1.4% of physicians experience non-suit claims each year. Conversely, apology laws increase the probability of a lawsuit by 1.2 percentage points for non-surgeons. 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 non-surgeon physicians, increasing the share of claims involving a lawsuit and decreasing the share of non-suit claims.

[117] As noted in the Technical Appendix, apology laws have no statistically significant effect on the probability that either surgeons or non-surgeons face any type of claim.

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



Notes: N = 74,440. Each set of bars represents the percentage point change in the probability of facing a specific type of malpractice dispute. The average probability of facing any claim for physicians in our dataset is 0.4. The average probability of facing a non-suit claim and lawsuit are 0.14 and 0.26, respectively. The regression results from which the information for this figure is derived are reported in Table A1 of the Technical Appendix.

In general, the 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 experience either a non-suit claim or a lawsuit but do affect the mix of claims experienced by non-surgeons. Apology laws reduce the probability that a non-surgeon will have a non-suit claim filed against her. However, this reduction in the probability of a non-suit claim is more than offset by the increased probability of a lawsuit. Overall, apology laws do not reduce the malpractice risk faced by any physicians in this specialty and increase the risk of lawsuits for non-surgeons.

These results are generally consistent with the presence of asymmetric information since apology laws do not 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. Non-surgeons see their probability of facing a lawsuit increase as a result of apology laws, while surgeons do not see a similar increase. Assuming it is easier to detect the malpractice of a surgeon than a non-surgeon (which is likely given that surgical errors are more obvious to patients than non-surgical errors like misdiagnosis or failure to refer), the increase in the probability of a lawsuit for non-

surgeons and the absence of an increase for surgeons is consistent with apology laws encouraging apologies that contain a signal 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.

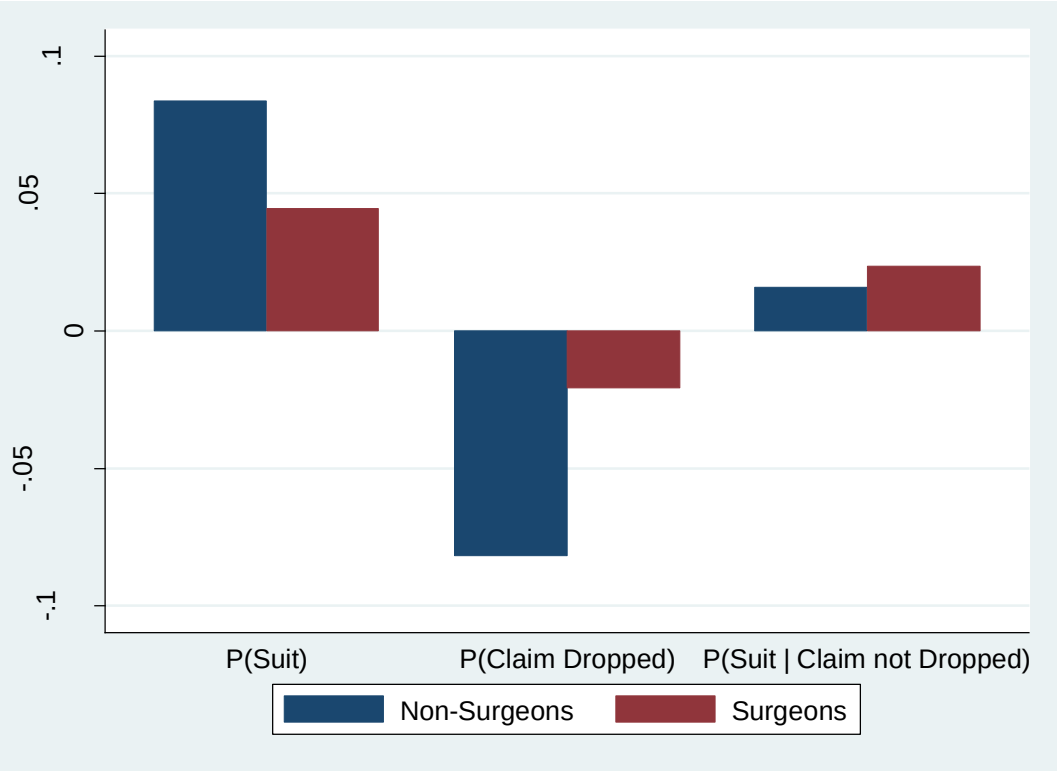
To further explore whether patients substitute formal lawsuits for non-suit claims as a result of apology laws, we limit our analysis to the 3,417 claims that were actually filed. Focusing on this limited sample, we estimate the effect of apology laws on different litigation outcomes, including whether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

Figure 4 reports results from our analysis of litigation outcomes. The first set of bars represents the effect of apology laws on the probability that a claim against a physician becomes a lawsuit. In general, non-surgeons see the probability of a claim leading to a lawsuit increase as a result of apology laws by 8.4 percentage points—an approximately 13% increase relative to the national average. Surgeons see a much smaller increase.[118] The next set of bars captures the effect of apology laws on the probability that a claim is dropped after it is asserted. For non-surgeons, the probability that a claim is dropped decreases in the presence of apology laws by 8.2 percentage points—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 a claimant pursues a lawsuit, conditional on not dropping her claim. In general, apology laws do not have a substantial effect on this probability for surgeons or non-surgeons, 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 support the unintended effects hypothesis and suggest the presence of asymmetric information. While these laws have little effect on surgeons, they increase the probability that a claim filed against a non-surgeon will involve a lawsuit, suggesting that apology laws push claimants into the courtroom. Similarly, fewer claims against non-surgeons are dropped, which is consistent with apologies from physicians signaling the occurrence of malpractice to patients and encouraging them to press their claims when they otherwise would not have.

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

Figure 4: Effect of Apology Laws on Litigation Outcomes



Notes: 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 A2 of the Technical Appendix.

2. The Effect of Apology Laws on Malpractice Payments

We now turn to the second component of malpractice risk—the magnitude of the loss from a claim. Table 3 reports summary statistics for indemnity payments and defense costs (i.e., ALAE) for the entire sample of claims. Focusing on Panel A, which reports statistics for all claims, the average indemnity payment was over $73,000, while the average positive payment was over $180,000.[119] Interestingly, the average ALAE is less than $1,000 higher for claims that result in a payment to the claimant relative to all claims, suggesting that the cost of defending a claim does not depend heavily on whether a claimant is ultimately successful. Both average indemnity payments and defense costs are higher in states without an apology law. Focusing on Panels B and C, average indemnity payments and defense costs are substantially higher for lawsuits than for non-suit claims. The average indemnity payment for non-suit claims is higher in states with an apology law. For lawsuits, however, the average indemnity payment is higher in states without an apology law.

[119] Here, and throughout the rest of the analysis, all payments and costs are reported in 2011 dollars.

Table 3: Summary Statistics for Indemnity Payments and Defense Costs

	All Payments			Nonzero Payments		
	N	Mean	Std Dev	N	Mean	Std Dev
Panel A: All Claims						
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
ALAE	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
Panel B: Non-suit Claims						
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
ALAE	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
Panel C: Lawsuits						
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
ALAE	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

Notes: Statistics in the first three columns represent all claims. Statistics in the last three columns are conditional on the indemnity payment being nonzero. All payments are reported in 2011 dollars.

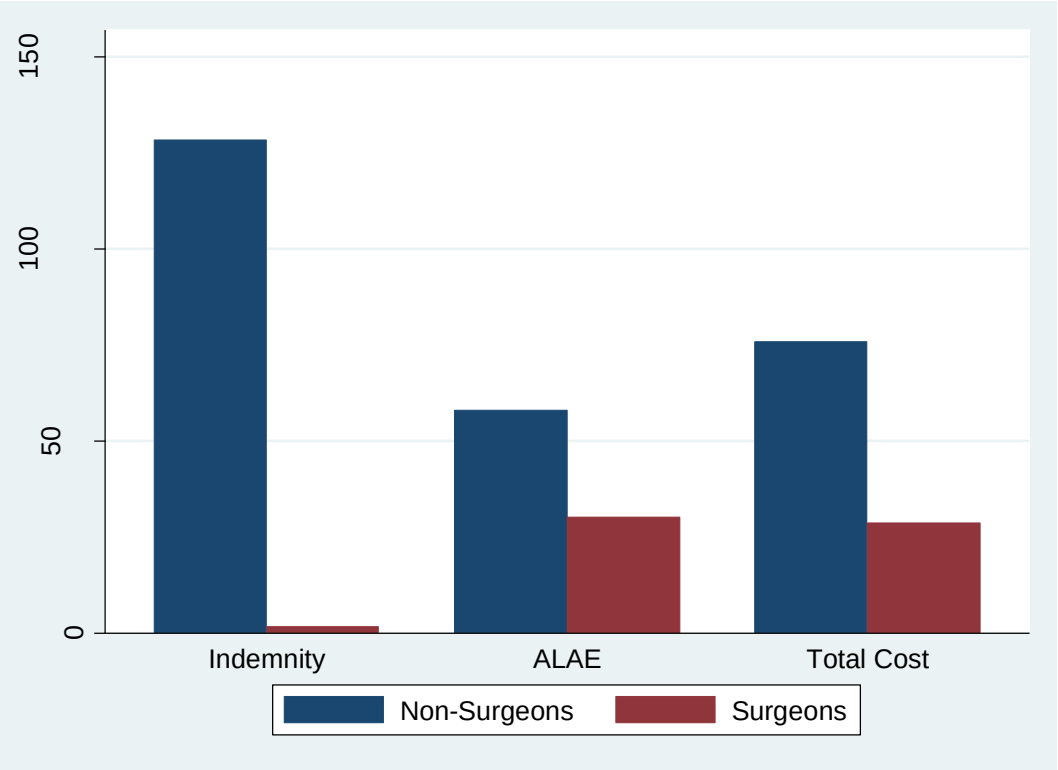
To test the causal relationship between apology laws and the magnitude of indemnity payments and defense costs, we again estimate difference-in-differences models.[120] We focus on three separate outcomes when exploring the effect of apology laws on the magnitude of malpractice claims: indemnity payments, ALAE, and total costs (i.e., indemnity plus ALAE). When estimating our empirical models,

[120] The details of these models are discussed in the Technical Appendix.

we include all claims. 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.[121]

Figure 5 reports the effects of apology laws across three different payment types (all of which are conditional on a claim being asserted). Across all three payment types, physicians must pay out more following the passage of an apology law, and the increase in payouts is always higher for non-surgeons than surgeons.[122] While apology laws increase both ALAE 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 non-surgeons make more than double following the passage of an apology law.

Figure 5: Effect of Apology Laws on Malpractice Payments



Notes: 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 for this figure is derived are reported in Table A3 of the Technical Appendix.

Overall, the estimated effects are not consistent with the intended effects of apology laws, but they are consistent with the presence of asymmetric information. The fact that non-surgeons 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 non-surgeon. As with the first

[121] This is discussed further in the Technical Appendix.

[122] However, as shown in the Technical Appendix, the effects of apology laws are statistically significant only for indemnity payments.

phase of our analysis, all of the results in the second phase suggest that apology laws fail to achieve their stated goal of reducing medical malpractice liability risk.

V. POLICY IMPLICATIONS

A. The State of the Evidence on Apology Laws

Overall, the evidence suggests that apology laws do not reduce physicians' malpractice risk. In general, unless a physician regularly performs surgery, she will see both the probability of facing a lawsuit and the payment she can expect to make as part of a claim increase. While non-surgeons do see a decrease in the probability of facing a non-suit claim, the evidence suggests that claimants are simply substituting formal lawsuits for non-suit claims, which is problematic given that lawsuits cost, on average, over five times as much to defend. 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 as part of a claim, they do not benefit from apology laws, as their malpractice risk remains relatively flat in the apology law and no apology law situations. The results are consistent with the unintended effects hypothesis discussed above. A potential determinant of these relationships is the presence of asymmetric information whereby apologies contain signals of malpractice that encourage patients to pursue lawsuits and larger indemnity payments. Future work may consider the effect of apology laws on other specialties that perform surgeries at different rates to further explore the presence of asymmetric information.[123]

Our evidence has both some parallels as well as some differences with prior work on apology laws. In particular, Ho and Liu find that apology laws consistently increase the frequency of malpractice claims with positive payouts by about 15%, consistent with the results here.[124] They further find 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 injury types.[125] We find results generally consistent with these effects.

While our probability results are consistent with Ho and Liu's frequency results, they find additional evidence from a state-level analysis that suggests the net effect of apology laws is zero (or possibly negative) in the long run, i.e., years after an apology law is passed.[126] Examining the probability of a physician being subject to a claim directly, we find evidence that apology laws simply increase the probability of lawsuits for non-surgeons in general and no evidence that this effect dissipates over time.[127] With respect to claim payouts, Ho and Liu find consistent

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[123] 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.

[124] Ho & Liu, *Does Sorry Work*, *supra* note 8, at 156.

[125] *Id*. at 157–162.

[126] *Id*. at 157–59.

[127] Repeating the state level analysis performed by Ho & Liu, *Does Sorry Work*, *supra* note 8, at 157–59, we find no statistically significant results.

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.[128] However, the results here suggest that, while surgeons experience little effect of apology laws, claim payouts actually increase for non-surgeons. Similarly, we find no statistically significant evidence that claim payouts vary by injury type. The contrast in these results suggests that excluding claims involving no payment to a patient may not provide a complete picture of the effect 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 risk.[129] 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 risk.

B. Why Are Apology Laws Not Enough?

The contrast in results from hospital-specific apology and disclosure programs and from apology laws begs the question: what separates the two? The answer almost certainly lies in training. Physicians in the programs that have been studied likely benefit from being trained when to apologize and what to say when apologizing as part of a specific physician disclosure program. The importance of this training is illustrated by an Ohio case involving that state's apology law. In *Davis v. Wooster Orthopaedics & Sports Medicine*, an orthopedic surgeon who had caused the death of patient following surgery stated that "he had nicked an artery and that he took full responsibility for it."[130] The Ohio appellate court explained that, although the physician contended that this admission fell within the ambit of Ohio's apology law,[131] it constituted an admission of fault and not simply a statement of condolence.[132] Thus, the court held that, though the physician believed his statements were protected, they were nevertheless admissible evidence under Ohio's apology law.[133]

Similarly, in *Lawrence v. MountainStar Healthcare*, a Utah appellate court addressed a situation where various individuals made a number of statements to a patient injured as a result of an incorrectly administered drug.[134] The 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

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[128] *Id*.; Ho & Liu, *What's an Apology Worth*, *supra* note 16, at 188–94.
[129] *See, e.g.*, Kraman & Hamm, *supra* note 53; Boothman et al, *supra* note 57; Kachalia et al., *supra* note 20; Adams et al., *supra* note 58.
[130] 952 N.E.2d 1216, 1218 (2011).
[131] Unlike other states with similar laws, Ohio's apology law does not specifically exempt admissions of fault from the protection afforded by the law. *See* OHIO REV. CODE ANN. § 2317.43.
[132] Wooster, 952 N.E.2d at 1218–22.
[133] *Id*.
[134] 320 P.3d 1037, 1041–45 (2014).

was at fault were not protected.[135] This case, along with the Ohio case, illustrates the importance of knowing what to say and when to say it, and apology laws provide training 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 that malpractice has occurred to the patient). 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 better means to achieve the goals of apology laws, as these laws may promote apologies but do not provide physicians with any instructions on how to communicate with patients.[136]

Beyond not providing physicians with a guide on how to apologize, apology laws may also suffer from poor statutory design. Anna C. Mastroianni and colleagues explain 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.[137] If an apology law protects only statements of sympathy, physicians may not be able to fully explain the nature of a particular medical error. If this is the case, then patients may not perceive an apology as sincere, which may provoke rather than assuage anger. The critique offered by Mastroianni and others is consistent with Robbennolt's experimental evidence on apologies.[138] Robbennolt finds that a full apology can assuage individuals' anger and make them more amendable to settlement, but the effect of partial apologies—the type protected by the laws we consider here—is not as strong.[139]

Even if there is a marginal decrease in an individual's anger following an apology, expressions of sympathy may encourage patients to search for information and 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, and this observation is consistent with our results.[140]

The Mastroianni critique of apology laws dovetails with the research conducted by Erin O'Hara O'Connor. 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

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[135] *Id*. at 1046–51.

[136] Beyond not providing training on how to apologize, apology programs at specific hospitals or other institutions often include an early settlement offer, which physicians apologizing outside of these programs may not provide. This early settlement offer may be the key to discouraging lawsuits, especially if apologies themselves contain a signal that malpractice has occurred.

[137] Anna C. Mastroianni et al., *The Flaws in State 'Apology' and 'Disclosure' Laws Dilute Their Intended Impact on Malpractice Suits*, 29 HEALTH AFF. 1611, 1614 (2010).

[138] Robbennolt, *supra* note 1; Robbennolt, *supra* note 3.

[139] Robbennolt, *supra* note 1; Robbennolt, *supra* note 3.

[140] Mastroianni et al., *supra* note 137.

repair the damages in some way."[141] Apology laws fail to provide protection for all but the second component, i.e., the other components would be admissible as evidence of a physician's liability. The defects in the statutory structure identified by the Mastroianni group and highlighted by O'Connor's research may be exacerbated if physicians follow the general trend toward greater patient communication 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 evaluations suggest that apology laws are flawed and fail to achieve their stated goal of reducing medical malpractice liability risk. However, this result begs an important question. If apology laws increase malpractice risk and, on balance, are not in their 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 has been positive. An advocacy organization has even been established with the specific goal of promoting apologies in the medical malpractice context.[142] Physicians may be familiar with this new culture of apologies and may rush to apologize following an error without completely understanding the risks and complexities of apologizing in the wake of an error. Moreover, many physicians are not involved in multiple malpractice actions, 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

Despite their goals of reducing the risk of medical malpractice liability and facilitating settlement, none of the evidence presented above suggests that apology laws do so. Moreover, for physicians who do not perform surgery, apology laws have the perverse effect of both increasing the probability that these physicians face lawsuits and the size of the payments they must make to resolve claims. Given the failure of apology laws to have their intended effect 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 these laws, given their specific inability to achieve their stated purpose. Our results do not indicate any increase in medical malpractice liability risk that would result from this course of action.[143] However, it is important to place our empirical results in a broader

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

[142] *See* SORRY WORKS!, sorryworks.net (last visited Jan. 2, 2018).

[143] *Cf.* Arbel and Kaplan, *supra* note 9, 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.").

context. While the results undermine the conclusion that apology laws are effective at accomplishing the liability cost reduction task 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,[144] and the specific inability of apology laws to reduce litigation against physicians does not change this fact. Erin O'Hara O'Conor has traced the role of apologies in primate and human behavior using an evolutionary approach,[145] concluding that apologies play an important role in society that is not likely to disappear in the future.[146] Thus, while apology laws are not effective in 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."[147] If apology laws—even unintentionally—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.[148]

Next, if state lawmakers remain committed to the goals of apology laws but want a more effective means of accomplishing these goals, they may turn to more traditional, hospital-specific apology programs that provide physicians with training regarding the effective utilization of apologies. 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, 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

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[144] Daicoff, *supra* note 2, at 144–49; TAVUCHIS, *supra* note 32, at 13.

[145] O'Hara O'Connor, *supra* note 141, at 1964 ("Humans often de-escalate conflicts with conciliatory gestures, and evidence indicates that other highly evolved social species also use conciliatory gestures.").

[146] *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.").

[147] *Id*.

[148] Additionally, state lawmakers must consider the evidence that apology laws promote the increased practice of defensive medicine and increase mortality rates among patients suffering from heart attacks when deciding on the future of apology laws. McMichael, *supra* note 22, at 48-55.

available to initiate these programs. Conveniently, hospitals need not start from scratch in developing their own programs, as the Agency for Healthcare Research and Quality ("AHRQ") has developed the Communication and Optimal Resolution ("CANDOR") Toolkit.[149] CANDOR offers health care organizations training to "[e]ngage patients and families in disclosure communication following adverse events," and was developed through expert analysis and a multi-million dollar grant initiative.[150] While other programs may be available, the CANDOR program would likely impose a relatively small financial burden on states which both remain committed to the goals of apology laws and achieving those goals via the apology-reconciliation framework.[151]

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 able to glean information 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 can 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,"[152] attorneys routinely advised their physician clients not to apologize. Though this advice has been criticized,[153] our results suggest that the attorneys offering it were "right all along." Apologies can be dangerous for physicians, even when they are 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 in an apology-law state, other evidence is not, and an apology may be a red flag to begin searching for this evidence.

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[149] *Communication and Optimal Resolution (CANDOR) Toolkit*, AHRQ, https://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/candor/introduction.html (last visited Jan. 2, 2018).

[150] *Id.*

[151] For states that want to achieve the goals of apology laws but are not committed to using apologies to do so, traditional tort reform remains an option. However, certain reforms have been more successful than apology laws in reducing malpractice litigation, not all reforms are created equally. *See* MELLO & KACHALIA, *supra* note 11, at 1-90 (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 and Kaplan, *supra* note 9, (discussing this opposition and its nonexistence with respect to apology laws).

[152] Arbel and Kaplan, *supra* note 9, at 1204.

[153] Chandler Farmer, *Striking a Balance: A Proposed Amendment to the Federal Rules of Evidence Excluding Partial Apologie*s, 2 BELMONT L. REV. 243, 249 (2015).

CONCLUSION

While touted as a tort reform that might limit medical malpractice risks, apology laws differ from other tort reforms that are narrower in that they only either limit liability or limit damages. Of course, apology laws also impose limits, which in this instance pertain to whether the apology can be introduced as evidence. However, 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 information indicating that the physician has made a medical error. This information may boost the patient's estimate of the likely success of a claim and may also bolster the patient's resolve in pursing the claim. In the case of 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 litigation around medical malpractice, and over 70% of the people in the United States currently live in a state with an apology law. Despite their status as one of the most popular tort reforms in the country, however, relatively little evidence on the role of these laws in medical malpractice litigation exists. 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 effect 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, non-surgeons see the chances of facing a lawsuit as well as the size of the payments they must make to resolve claims increase. These effects are consistent with an asymmetric information relationship between non-surgeons and their patients. In general, we find little evidence to suggest that states should continue with apology laws as mechanisms for reducing litigation. Indeed, from the physician perspective—ostensibly, the intended beneficiaries of these laws—apology laws substantially derogate their position by increasing malpractice liability risk. Overall, the evidence suggests that apology laws are simply not enough.

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TECHNICAL APPENDIX

To Accompany

Sorry Is Never Enough:
The Effect of State Apology Laws on Medical Malpractice Liability Risk

Note to Editors: This Technical Appendix may be included with the published version of our Article at your discretion. It may be published in its entirety, or only those parts that the editors believe would be most helpful to the reader may be published. In the alternative, the Technical Appendix may be made available on the journal's website, or the authors can publish it on their websites.

TECHNICAL APPENDIX: EMPIRICAL SPECIFICATIONS AND REGRESSION RESULTS

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:

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

In this specification, *i* indexes physicians, *s* indexes states, and *t* indexes time. *I(Y)* is an indicator variable that takes the value one if physician *i* practicing in state *s* experienced a claim in year *t*. In later specifications, *I(Y)* is an indicator for whether a physician experienced a non-suit claim and for whether a physician had a lawsuit filed against her.

The variable *apology law* 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. The *surgical* variable is an indicator for whether a physician ever possessed a malpractice policy that rated her for surgery. We also include an interaction between the surgical and apology law indicator variables to examine whether apology laws affect surgeons differently than other physicians as discussed in the main text.

The vector *X* includes control variables for all of the healthcare infrastructure and population demographics discussed in the main text as well as the total number of specialist physicians practicing in the state. The variables in this vector serve as proxies for healthcare infrastructure and treatment intensity, which prior work has shown varies substantially across the country.[1] This vector also includes an indicator for whether a state had enacted a noneconomic damages cap. We do not control for other tort reforms. In general, the last wave of damages-centric tort reforms occurred between 2001 and 2005.[2] Because our analysis includes only 2004 through 2011, state fixed effects control for other tort reforms. And we include state, δ, and time, τ, 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 noted by Ai, Norton and others, the marginal effect of a change in two interacted 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.[3] Ho and Liu follow a similar approach.[4]

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[1] *Understanding of the Efficiency and Effectiveness of the Health Care System*, THE DARTMOUTH ATLAS OF HEALTH CARE, http://www.dartmouthatlas.org/; Per Capita Health Care Spending on Diabetes: 2009-2013, Health Care Cost Institute (2015), http://www.healthcostinstitute.org/files/HCCI%20Diabetes%20Issue%20Brief%205-7-15.pdf.

[2] David A. Hyman, Charles Silver, Bernard Black, & Myungho Paik, *Does tort reform affect physician supply? Evidence from Texas*, 42 INTERNAT'L REV. L. ECON. 203 (2015).

[3] Chunrong Ai & Edward C. Norton, Interaction terms in logit and probit models, 80 Econ. Letters 123 (2003); Edward C. Norton; Hua Wang, & Chunrong Ai, *Computing interaction effects and standard errors in logit and probit models*, 4 STATA J. 154 (2004).

[4] Benjamin Ho and Elaine Liu, *What's an Apology Worth? Decomposing the Effect of Apologies on Medical Malpractice Payments Using State Apology Laws*, 8 J. EMPIRICAL L. STUD. 179 (2011) [hereinafter Ho & Liu, *What's an Apology Worth*].

We begin by estimating the effect of apology laws on whether a physician was a party to a malpractice dispute in a given year. Table A1 reports results from LPMs with three different dependent variables. The first column reports results with an indicator for whether a physician had any claim filed against her in a given year. Apology laws do not have a statistically significant effect on the probability that a physician experiences a malpractice claim of any kind. Column (2) reports the results of an LPM with an indicator for whether a physician experienced a non-suit claim as the dependent variable. Apology laws have different effects on the probabilities that surgeons and non-surgeons have non-suit claims asserted against them. For non-surgeons, apology laws decrease the probability of a non-suit claim by 1 percentage point, which is substantial given that only about 1.4% of physicians experience non-suit claims each year. For surgeons, apology laws result in a small, and statistically insignificant, increase of about 0.1 percentage points in the probability of a non-suit claim.[5]

Column (3) of Table A1 reports the results of an LPM with an indicator for whether a physician was 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 non-surgeons, 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 average. 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 non-surgeon physicians.

To further explore whether patients substitute formal lawsuits for non-suit 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:

$$(2) \qquad I(Y)_{ist} = \beta_1(apology\ law)_{st} + \beta_2(apology\ law)_{st} \times (surgical)_{st} + \beta_3 surgical_{ist} + X'_{st} + W'_{st} + \delta_s + \tau_t + \varepsilon_{ist}.$$

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 both a claim being filed and the claim not being dropped. The variables *apology law* and *surgical* are as defined above. The vector *X* contains the same control variables discussed above. The vector *W* 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 (NAIC). Each injury is classified as one of the following: emotional, insignificant, minor temporary, major temporary, minor permanent, significant permanent, major permanent, grave, or death. The vector *W* includes indicators for each type of injury with death as the omitted category. As before, δ and τ are state and time fixed effects, respectively.

Table A2 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. Non-surgeons see the probability of a claim leading to a lawsuit increase as a result of apology laws by 8.4 percentage points—an approximately 13% increase relative to the national average. Neither the coefficient on the interaction between the apology law

[5] 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.

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 non-surgeons, the probability that a claim is dropped decreases in the presence of apology laws by 8.2 percentage points (significant at the 0.10 level)—an approximately 30% decrease relative to the national average. 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 pursues a lawsuit conditional on not dropping her 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:

$$(3)\ \mathrm{Y}_{ist} = \beta_1(apology\ law)_{st} + \beta_2(apology\ law)_{st} \times (surgical)_{st} + \beta_3 surgical_{ist} + X'_{st} + W'_{st} + \delta_s + \tau_t + \varepsilon_{ist}.$$

In this equation, the dependent variable, *Y*, is the natural logarithm of the indemnity payment, the natural logarithm of defense costs, or the natural logarithm of total costs (indemnity plus ALAE).[6] All of the variables and vectors in this specification are as described above. Each specification includes state, δ, and year, τ, 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, Angrist and Pischke argue that even in the presence of zeros, the marginal effects estimated by ordinary least squares (OLS) are approximately correct.[7]

Column (1) of Table A3 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 asymmetric information. If patients can better determine the extent of injuries caused by surgeons than those caused by non-surgeons, then apologies, serving as signals of malpractice, should increase the average indemnity payment made by non-surgeons to a greater extent than the average indemnity payment made by surgeons.

Column (2) of Table A3 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 effects—reducing the costs expended as part of malpractice disputes.

[6] Prior to taking the natural logarithm, we add 1 to all indemnity payments and defense costs.
[7] JOSHUA ANGRIST & JORN-STEFFEN PISCHKE, MOSTLY HARMLESS ECONOMETRICS (2009).

Table A1: Linear Probability Model Results for the Effect of Apology Laws on the Probability of Malpractice Disputes

Variables	(1) I(claim)	(2) I(non-suit claim)	(3) I(suit)
Apology Law	0.002	-0.010***	0.012***
	(0.005)	(0.003)	(0.004)
(Apology Law)x(Surgical)	-0.001	0.011***	-0.012**
	(0.005)	(0.003)	(0.005)
Surgical	0.037***	0.007***	0.031***
	(0.003)	(0.002)	(0.004)
Observations	74,440	74,440	74,440
R-squared	0.010	0.010	0.008

Notes: These regression results are partially reported in Figure 3 in the main text. The dependent variables are, respectively, indicators for whether a physician experienced any claim, a non-suit 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 65, the percentage white, the percentage black, the percentage Hispanic, the percentage of the state population 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 A2: Linear Probability Model Results for the Effect of Apology Laws on the Probability of Litigation Outcomes Conditional on a Claim Being Asserted

Variables	(1) I(suit)	(2) I(claim dropped)	(3) I(suit | claim not dropped)
Apology Law	0.084**	-0.082*	0.016
	(0.039)	(0.045)	(0.035)
(Apology Law)x(Surgical)	-0.039	0.061	0.008
	(0.032)	(0.041)	(0.029)
Surgical	-0.022	0.004	-0.021*
	(0.025)	(0.029)	(0.012)
Observations	3,417	3,417	2,479
R-squared	0.202	0.160	0.152

Notes: The dependent variable in column (1) is an indicator for whether a lawsuit was filed. In column (2), the dependent variable is an indicator for whether the claimant dropped her claim. In column (3), the dependent variable is an indicator for whether a lawsuit was filed conditional on a 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 65, the percentage white, the percentage black, the percentage Hispanic, the percentage of the state population 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 A3: OLS Results for the Effect of Apology Laws on Malpractice Payments Conditional on a Claim Being Asserted

Variables	(1) log(Indemnity)	(2) log(ALAE)	(3) log(Total Cost)
Apology Law	1.283*	0.580	0.759
	(0.692)	(0.406)	(0.463)
(Apology Law)x(Surgical)	-1.267**	-0.279	-0.473
	(0.521)	(0.359)	(0.428)
Surgical	1.809***	1.045***	1.194***
	(0.375)	(0.226)	(0.297)
Observations	3,417	3,417	3,417
R-squared	0.126	0.154	0.169

Notes: 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 65, the percentage white, the percentage black, the percentage Hispanic, the percentage of the state population 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