Independent Actuarial Analysis of Maryland's Hospital Medical Liability Climate

Final Report

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4160 Patterson Avenue
Baltimore, MD 21215

Submitted by:
Abt Associates
6130 Executive Boulevard
Rockville, MD 20852

In Partnership with:
Milliman, Inc. (Stephen J. Koca, FCAS MAAA)

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PREFACE

The statements contained in this report do not necessarily reflect the views or policies of the HSCRC. Milliman, Inc. and Abt Associates assume responsibility for this report.

Authors

Milliman, Inc.
Stephen J. Koca, FCAS MAAA

Abt Associates
Rayan Joneydi
Louisa Buatti
Betty Fout

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The Chairmen of the Senate Budget and Taxation Committee and House Appropriations Committee's "Report on the Fiscal 2021 State Operating Budget (SB0190) and the State Capital Budget (SB0191) and Related Recommendations" (Joint Chairmen's Report) required the Health Services Cost Review Commission (HSCRC) to fund an independent actuarial analysis of Maryland's medical professional liability (MPL) market due to concerns that insurers are leaving the state.

Milliman, in partnership with Abt Associates, produced this report, which contains the required independent actuarial analysis in response to Task Order HSCRC-TO-2020-20-0263. The purpose of this report is to: 1) analyze and compare Maryland's MPL climate with other US states; 2) examine programs for reducing MPL costs in other states; 3) evaluate the impact on Maryland's MPL climate of implementing the provisions of California's Medical Injury Compensation Reform Act (MICRA) and programs in other states designed to curb MPL costs (e.g., birth injury funds); and 4) make recommendations on how to stabilize the hospital liability market in Maryland.

Overview of Maryland's Medical Liability Climate

Hospital systems generally maintain reserves or self-insure for a certain amount of financial risk ("retained risk"), and purchase insurance from MPL insurance companies for coverage of additional financial risk.[1] The additional risk not retained is referred to as "excess risk", and the insurance purchased is referred to as "excess of loss" or "excess" insurance. To give an example, suppose that a hospital has $5 million of retained risk and purchases $100 million of excess insurance coverage. If the hospital were liable for a $20 million malpractice claim, it would have to pay $5 million out of pocket and the insurance would cover the remaining $15 million.

Comparing losses paid by insurance companies filing National Association of Insurance Commissioners (NAIC) annual statements to population, Maryland is among the states with the highest losses paid by insurers reporting data to the NAIC (Figure 6).[2] The average size of a hospital professional liability loss payment between 2010 and 2020 (limited to $10 million per event in order to reduce the influence of very large claims) is 75% larger in Maryland than countrywide statistics based on internal Milliman data (Figure 7).

As a result of growing MPL loss payments in Maryland, excess insurers have been requiring Maryland hospitals to increase the amount of retained risk (Figure 3A, 3B, 3C). In 2020, the amount of excess insurance purchased by Maryland hospitals decreased (Figure 1, 2A, 2B, 2C), presumably due to a lack of availability of insurers willing to provide the levels of excess insurance coverage desired by hospitals. Further, excess insurers have taken actions to reduce their risk in Maryland by increasing premiums on the coverage they do provide (Figure 5). Increased retention of risk, decreased amounts of insurance purchased, and higher premiums for the available insurance introduces additional uncertainty and burden on hospital financial results.

This is not all unique to Maryland. The MPL excess insurance market has entered a nationwide "hard market" with increasing risk retention, premiums, and more restrictive coverage terms; however, the MPL

[1] The retained risk is typically per MPL event, with an aggregate amount retained on an annual basis (the annual aggregate retention is not commonly reached in practice).

[2] Note that NAIC insurer data represents only a portion of the MPL market. It excludes most retained risk mechanisms, offshore excess insurance, and payments made through state-administered funds (i.e., birth injury, patient compensation). States with a state-administered fund (which Maryland does not have) may be biased low relative to other states in this comparison. The ranking of states by costs may change if we were able to accurately adjust for the missing (i.e., non-NAIC) data for each state. Sections 2.2 and 3.2.4 provide further discussion.

market in Maryland appears to be particularly affected. This study collected and analyzed data directly from Maryland hospitals to understand the MPL environment in Maryland and explore whether programs existing in other states might help to stabilize Maryland's MPL market.

Maryland Hospital Survey

Data were collected directly from Maryland hospitals and health systems[3] throughout the state regarding their excess insurance programs and historical MPL claims. Excluding government-owned and psychiatric facilities, survey responses represented approximately 80% of inpatient days and 65% of annual obstetric deliveries in the State of Maryland. Survey respondents provided detail on closed (finalized) malpractice claims from 2010 through 2020. Other data sources used for this study are described in Section 2.

Impact of Implementing MICRA Provisions on Maryland's Medical Liability Climate

California's Medical Injury Compensation Reform Act was passed in 1975 and contains various reforms to tort law specifically intended to reduce MPL costs. Table 1 provides a summary comparison of key components of the Maryland and California MPL tort environments. The comparison shows multiple areas where Maryland's MPL environment results in higher risks to hospitals and malpractice insurers.

Table 1. Comparison of the Maryland and California Medical Professional Liability Tort Environment

Tort Law Component	Maryland	California
Cap on Non-Economic Damages[a]	$845,000[b]	$250,000
Attorney Fees	Unlimited	Based on sliding scale by layer of indemnity
Collateral Source Rule (CSR)[c]	CSR Applies	Exception to the CSR
Periodic Indemnity Payment[d]	Allowed	Allowed
Statute of Limitations	3 Years	3 Years

[a] Non-economic damages may include pain, emotional anguish, humiliation, reputational damage, loss of enjoyment of activities, or worsening of prior injuries (referred to as "pain and suffering" in some states).
[b] The Maryland cap on non-economic damages increases $15,000 annually; the $845,000 figure applies to MPL events occurring in 2021. The cap is set at 125% of the regular cap for cases alleging wrongful death where there are two or more beneficiaries (equal to $1,056,250 for MPL events occurring in 2021).
[c] CSR prevent damages from being reduced by amounts already recovered from a third party.
[d] Instead of a lump sum, losses are paid over time.

Using the data collected from Maryland hospitals and other secondary data sources (see Section 2), we developed a model to estimate individual MPL claim sizes under alternative tort law environments. We simulated the effect of applying the provisions of MICRA to the Maryland hospital MPL market and estimated that hospital MPL costs in Maryland would decrease by 23%, resulting from both a lower

[3] The term hospital as used throughout this report includes health systems.

average claim size and fewer claims filed.[4] Results are based on the following assumptions regarding how the provisions of MICRA would impact the costs associated with MPL insurance coverage:

1. Events that are settled or go to trial and for which a verdict is rendered would incur lower loss payments, primarily due to the exception to the CSR and the decrease in the cap on non-economic damages.
2. Given the lower indemnity payments, plaintiff attorneys may be less financially motivated to incur additional expenses such as expert witnesses to support the amounts on which these payments are based. Hence, hospitals would incur lower legal costs in defending against these arguments.
3. The number of events reported and indemnified would be expected to decrease. This results from the lower incentive for plaintiffs and plaintiff attorneys to file claims, as they would expect lower loss payments. Additionally, with attorney fees capped, as under MICRA, there would be less financial incentive for plaintiff attorneys to pursue claims.

Other Programs for Reducing MPL Costs

In addition to tort reform options like MICRA, government-created funds can help to improve the availability of MPL insurance as well as reduce MPL costs. Two such programs that exist in other states are Patient's Compensation Funds (PCF) and birth injury funds.

PCFs are state-operated funds that cap a defendant healthcare provider's per claim exposure at a state-defined amount. The fund pays any amount of a claim exceeding this threshold. Patient's compensation funds are typically financed by surcharges to the medical providers that benefit from the fund, similar to an insurance company. They do not replace the existing tort system nor do they change MPL negligence standards; PCFs guarantee the availability of MPL insurance to healthcare providers in the state. Participating healthcare providers are required to purchase private insurance coverage in an amount no less than the threshold at which the PCF coverage applies. In several cases, states have combined a PCF with certain tort reforms, such as a damage cap, to achieve MPL cost reduction goals.

Birth injury funds were created by Florida and Virginia in the late 1980s to keep infant neurological cases out of the court system. These funds operate on a "no fault" basis, meaning that injured parties do not need to prove the existence of medical negligence through the tort system to receive benefits from the fund. Entrance to the fund and its benefits are dependent on the child's injury(ies) meeting the definition of a qualifying birth injury. Funding for these benefits is based on fees or assessments levied on medical providers and/or liability insurance providers in the state. Operated effectively, these funds should result in reduced legal fees and improved timelines for reimbursement of relevant medical care. The birth injury funds in Florida and Virginia are the sole remedy for those with qualifying injuries; i.e., the families may not additionally benefit from a malpractice lawsuit.

An alternative birth injury fund is currently active in New York. Three primary features distinguish the New York fund: 1) the claims are brought using the tort system instead of through an independent administrative system; 2) the fund has a broader definition of a valid qualifying injury; and 3) the fund is financed through a state budget allocation.

While a rare event, claims related to permanent and significant birth injuries are the most expensive in Maryland, representing 3% of overall claims but 28% of total loss payments in the 2010 through 2020 period (18% of loss payments when reviewing losses limited to $10 million per event). These claims

[4] Physician MPL costs would be expected to decrease as well but to a lesser extent due to physician policy limits (typically at $1 million per event). These insurance policy limits often serve as de facto damage limits, thereby limiting damages paid on behalf of physicians.

represent 25% of Maryland claims exceeding a $10 million loss payment. When accompanied with a loss payment, these claims also have greater average defense expenses incurred than other injury types (see Section 13 Technical Exhibits, Exhibit 11 through 15). Providing a separate funding source for these potentially large claims through a birth injury fund would reduce the uncertainty inherent with hospital MPL risk retention. Since these claims make up a disproportionate amount of loss payments from excess insurers, a birth injury fund should also reduce the costs of excess insurance.

Recommendations for Stabilizing the Hospital Liability Market in Maryland

We estimate that implementing the provisions of California's MICRA would significantly reduce overall MPL costs in Maryland. The impacts of these tort reforms are broad and elements of them would touch on most MPL cases that currently go through the tort system. We estimate that an implementation of MICRA provisions would both reduce the size of losses and reduce the number of MPL claims in Maryland, primarily due to the exception to the CSR and the decrease in cap on non-economic damages. However, care would need to be exercised in drafting any such legislation as seemingly minor exceptions can have a material impact on the overall effectiveness of the legislation to reduce costs (see Section 6). In addition, various other states have experienced repeals, judicial or otherwise, of MPL tort reform provisions including damage caps.

Birth injury funds have been discussed in recent Maryland legislative sessions, with hearings on bills similar to the Virginia/Florida model (2019 session SB 869, HB 1320) and the New York model (2020 session SB 879, HB 1563). While only targeting a small subset of MPL claims, the reduction in cost to the tort system can be significant due to the average size of birth injury claims. Targeted legislation for these claims would decrease the uncertainty of MPL risk perhaps even more significantly than overall costs, as very large claims would be less likely to be litigated through the tort system. These cases typically involve substantial amounts of future medical care, something that MICRA reforms would not significantly reduce. Similar to any potential tort reform legislation, care would need to be exercised in determining qualifying injuries for the fund, funding sources, and parameters of the benefits to claimants. The risk of these claims would be transferred to the fund and, given the potential for substantial future care, small variance in the number of qualifying injuries could result in large changes in the required funding. This risk would be greatest in the early years of the fund as there would not be any Maryland-specific data on past fund utilization to estimate the amount of funding required.

Given the uncertainty surrounding the application of tort reform legislation and how birth injury funds might affect the number of claimants, we would expect the insurance market to react cautiously until issues are resolved in the courts and/or there is sufficient Maryland experience demonstrating reduced costs. A variety of factors influence a given insurer's risk appetite and willingness to write coverage in a particular venue. As a result, direct cost reductions, increased availability of hospital excess insurance and/or reduced uncertainty of MPL risk on hospital financials may not be immediate and are not guaranteed if provisions of the MICRA tort reform were to be enacted or if a birth injury fund were created.

In conclusion, we estimate that enacting provisions of MICRA tort reform and/or a birth injury fund would reduce MPL costs in the long-term and stabilize the hospital medical professional liability market in Maryland. Due to its broader nature, the provisions of MICRA may potentially lead to a greater reduction of MPL costs than a birth injury fund. However, due to the longer-term nature of tort reform playing out in the courts, we expect a birth injury fund would recognize MPL cost savings sooner.

Potential Areas for Future Research

Our quantitative model evaluates the impact on Maryland's MPL costs of implementing the existing provisions of California's MICRA, as requested by the Task Order HSCRC-TO-2020-20-0263. If needed, our model could be used to conduct additional analyses (beyond the scope of this report) to estimate the

impact of alternative provisions (e.g., different caps on non-economic damages or a cap on total damages[5]) and compare their relative effectiveness in reducing MPL costs in Maryland.

We have also provided a high-level summary of programs in other states designed to curb MPL costs, notably birth injury funds. Future research could evaluate the quantitative impact on MPL costs of implementing a birth injury fund in Maryland and compare the relative impact of implementing different types of birth injury funds. This would require specified parameters of the birth injury fund (e.g., qualifying injuries, benefits to be paid, etc.) and further data from Maryland hospitals on birth injury claims and obstetric deliveries that were not included in the hospital survey used in this report (see Section 2).

[5] A cap on both economic and non-economic damages would be more restrictive and would presumably reduce MPL costs more significantly than a cap on non-economic damages only.

1. Introduction

Hospital malpractice costs are a concern for various stakeholders in the Maryland healthcare system. In the 2020 Legislative Session, the legislature considered various bills related to the topic, including SB 879, HB 1563, SB 187, and HB 684 (see Section 2), and held several hearings to hear arguments from those on both sides of the issue. The parties involved were not able to agree on a solution before the abbreviated Legislative Session came to an end. Instead, the Joint Chairmen's Report required that the HSCRC oversee an independent actuarial analysis that includes:

1. The cost of hospital self-insurance programs including the availability, adequacy, and affordability of hospital reinsurance in Maryland.
2. An examination of hospital reinsurance climates in other states and the ability of states to maintain adequate access to hospital reinsurers.
3. The impact on Maryland's medical liability climate of implementing each of the provisions of California's Medical Injury Compensation Reform Act.
4. Recommendations on how to stabilize the hospital liability market in the state to ensure both continued access to essential services and success under Maryland's Total Cost of Care (TCOC) Model.

Milliman, in partnership with Abt Associates, produced this report in response to the Task Order HSCRC-TO-2020-20-0263. The scope of this analysis was determined by the four points above outlined in the Joint Chairmen's Report. In addition, as requested by the HSCRC in the Task Order, we compared Maryland's MPL environment to other relevant states (to include surrounding states Washington DC, Delaware, Virginia, and Pennsylvania, and other states with MPL cost-reducing programs such as Florida, New York, California, Oregon, Texas, Connecticut, and Massachusetts). We also discuss how implementing the provisions of programs in other states designed to curb MPL costs (notably birth injury funds) may impact costs in Maryland.

2. Data Sources

We used several publicly available and proprietary data sources to compare the medical professional liability environment in Maryland with that in other states and to support assumptions in our modeling of the impact of potential tort reform mechanisms. Some of these sources are based primarily on the physician and other individual medical provider (e.g., Nurse Practitioner, Physician Assistant, etc.) professional liability market[6] because public data is more readily available for these types of providers. Below, we discuss these data sources and their use in our analyses.

2.1. Maryland Hospital Survey

We surveyed Maryland hospitals to request information about their risk programs and historical, closed medical professional liability claims. The intent of the survey was to gather comprehensive historical and current data that are directly relevant to assessing the hospital liability climate in the state. In designing the survey, we attempted to balance the need to minimize facility burden during the COVID-19 pandemic while accommodating legislative deadlines. The survey instrument is provided in Section 12.

HSCRC sent the survey to all Maryland hospitals on December 9, 2020. Hospitals responded to the survey between December 15 and December 23, 2020. Excluding government-owned and psychiatric facilities, survey responses represented approximately 80% of inpatient days and 65% of annual obstetric deliveries in the state of Maryland. Survey respondents provided detail on closed (finalized) malpractice claims from 2010 through 2020. The data included over 2,500 claims with nearly $1.9 billion in loss payments made to claimants and $235 million of allocated loss adjustment expense (ALAE[7]) payments. An additional 1,700 claims had zero loss payments but $61 million of ALAE. In addition, respondents provided information on their retained MPL risk and excess insurance for the 2010 through 2020 period.

2.2. NAIC Insurance Company Annual Statements

Each insurance company regulated by a state insurance department that belongs to the National Association of Insurance Commissioners (NAIC) is required to file a publicly available Annual Statement that includes various data in a prescribed format by line of business. Aggregated data across these insurer reports can be reviewed for trends and provide important market data. This data shows approximately $300 million in direct written premium for the medical professional liability line of business in Maryland during 2019. The annual report filed by the Maryland Insurance Administration on the "Availability and Affordability of Health Care Professional Liability Insurance" (latest version dated September 1, 2020) largely relies on these insurance company reports.

However, these insurer reports provide an incomplete picture of the market because hospitals typically retain a significant portion of their risk via trusts or captive insurance companies, which are not required to submit data to the NAIC (i.e., "self-insurance"). Further, the non-domestic[8] reinsurers of these captive insurance companies may similarly not be submitting data on these risks to the NAIC coded in the medical professional liability line of business. We estimate the self-insured market is between one to two times the amount of risk as what is reflected on NAIC Annual Statements in the United States.[9] We

[6] For the remainder of this report, references to the physician medical professional liability market should be understood to be inclusive of other individual medical providers unless specifically stated otherwise.

[7] ALAE represents defense and litigation related expenses.

[8] We are broadly defining non-domestic insurance companies as those not reporting data to the NAIC.

[9] We are broadly defining the self-insured market to refer to anything not included on NAIC Annual Statements. Based on the Maryland Hospital Survey data provided for this study, we estimate the size of the self-insured market in Maryland to be within this range.

believe the MPL risks not reflected on NAIC Annual Statements are disproportionately from hospitals as opposed to individual physicians.

2.3. National Practitioner Data Bank (NPDB)

The NPDB is a "confidential information clearinghouse created by Congress to improve healthcare quality, protect the public, and reduce health care fraud and abuse."[10] The NPDB provides a public use data file[11] with de-identified MPL claims paid on behalf of physicians and other health care providers. The data file can be useful in assessing the number and rounded amount of paid claims against physicians and other individual health care providers by state. We have relied in part on data from the NPDB public use data file to determine the potential decrease in frequency resulting from a decrease in the cap on damages.

2.4. Reports from Other State Insurance Department or Patient's Compensation Funds

We examined MPL data sets from Texas and Louisiana to support our modeling assumptions and tort reform impact analyses, including the distribution of economic versus non-economic losses and medical versus non-medical loss payments.

Through 2012, Texas maintained a long-standing publicly available database of MPL claims. Although modified in 2013, for many years Texas Insurance Code Sections 38.153 to 38.163 required insurers to report closed claims to the Texas Department of Insurance. A report was required to be filed if the covered indemnity payment was $25,000 or more. Data fields available from the Texas data include the paid indemnity, paid defense costs, and closed date for each MPL claim in the database. We relied on this dataset to derive indications of the distributions of economic and non-economic indemnity and the relationship between them.

The Louisiana Patient's Compensation Fund ("Louisiana PCF") is the only publicly available data source of which we are aware that distinguishes medical and non-medical payments on MPL claims.

While the use of datasets external to Maryland increases uncertainty in our modeling, we believe them to be the most appropriate available sources to rely on for certain assumptions. We did not receive sufficient information from the Maryland Hospital Survey to rely on Maryland specific data for these assumptions. Claims databases, which hospitals used to respond to the Maryland Hospital Survey, typically do not contain detail on economic versus non-economic damages or medical versus non-medical loss payments.

2.5. American Hospital Association (AHA), Association of American Medical Colleges (AAMC), and American Medical Association (AMA) data on Healthcare Utilization and Physician Characteristics

AHA Hospital Statistics, Multiple Editions. The AHA conducts an annual survey of hospitals in the United States. The data include current and historical data on utilization, personnel, revenue, expenses, managed care contracts, community health indicators, and physician models.

AAMC's State Physician Workforce Data Report, Multiple Editions. The AAMC's *State Physician Workforce Data Report* provides the number of active physicians by state and year, along with other information. We relied on this information together with the data from the NPDB to estimate relative claim frequency by state.

[10] https://www.npdb.hrsa.gov/resources/aboutLegsAndRegs.jsp

[11] "National Practitioner Data Bank Public Use Data File, December 31, 2019, U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions, Division of Practitioner Data Banks."

AMA's Physician Characteristics and Distribution in the US, Multiple Editions. We relied on the AMA's publication *Physician Characteristics and Distribution in the US* in conjunction with the AAMC data in order to estimate the number of active physicians by state for years prior to 2014.

AHA, AAMC, and AMA healthcare utilization and physician characteristic data were utilized in both our review of Maryland's hospital medical liability climate and in our modeling of tort reform impacts.

2.6. Other Data Sources

Other data sources used in the preparation of this report are listed below:

- Maryland Insurance Administration Report on the "Availability & Affordability of Health Care Professional Liability Insurance", 2020 version (https://insurance.maryland.gov/Consumer/Appeals%20and%20Grievances%20Reports/2020-Report-on-the-Availability-and-Affordability-of-Healthcare-Professional-Liability-Insurance-MSAR-2976.pdf)
- Meeting with Maryland Hospital Association members (12/29/2020)
- The January 29, 2020 hearing for SB 187 (http://mgaleg.maryland.gov/mgawebsite/Committees/Media/false?cmte=jpr&ys=2020RS&clip=JPR_1_29_2020_meeting_1)
- The February 19, 2020 hearing for HB 684 (http://mgaleg.maryland.gov/mgawebsite/Committees/Media/false?cmte=jud&ys=2020RS&clip=JUD_2_19_2020_meeting_2)
- The March 5, 2020 hearing for SB 879 (http://mgaleg.maryland.gov/mgawebsite/Committees/Media/false?cmte=fin&ys=2020RS&clip=FIN_3_5_2020_meeting_1)
- The March 9, 2020 hearing for HB 1563 (http://mgaleg.maryland.gov/mgawebsite/Committees/Media/false?cmte=jud&ys=2020RS&clip=JUD_3_9_2020_meeting_1)
- State Health Access Data Assistance Center data regarding health insurance profile of Maryland population (http://statehealthcompare.shadac.org/table/11/health-insurance-coverage-type-by-total#22/5,4,1,10,86,9,8,6/25/21,22)
- Milliman internal medical professional liability benchmarking database
- Publicly available benchmarking reports prepared by various other organizations (insurance companies, insurance brokers, and other actuarial consulting firms).
- Iowa Insurance Division Medical Malpractice Annual Reports, Multiple Editions (https://iid.iowa.gov/documents/2019-medical-malpractice-report)
- Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico, U.S. Census Bureau, Population Division (https://www2.census.gov/programs-surveys/popest/tables/2010-2019/state/totals/nst-est2019-01.xlsx)
- The Kaiser Family Foundation Employer Health Benefits 2019 Annual Survey (http://files.kff.org/attachment/Report-Employer-Health-Benefits-Annual-Survey-2019)
- HealthCare.gov Out-of-Pocket Maximum/Limit (https://www.healthcare.gov/glossary/out-of-pocket-maximum-limit/)

3. Overview of Maryland's Medical Liability Climate

3.1. Damages in Medical Liability Cases

3.1.1 Economic vs. Non-Economic Damages

Damages awarded to a patient injured from a medical liability event can be separated into economic and non-economic components.[12] Economic damages compensate the injured party for the financial impact of the injury. These damages are directly estimable and include items such as lost wages and medical expenses. Non-economic damages include items such as pain and suffering, and loss of consortium. Non-economic damages are more difficult to quantify as there are no specific monetary amounts from which to calculate. The sum of these damage components is the total amount awarded to the injured party, less attorney fees.

3.1.2 Physician vs. Hospital Risk

Total damages are the amount paid to a patient because of an alleged act of negligence while the patient was in the care of a physician and/or hospital. Physicians purchase insurance coverage in Maryland that typically covers $1 million in damages per event. These insurance policy limits often serve as de facto damage limits, thereby limiting damages paid on behalf of physicians. Hospitals, on the other hand, are perceived to have greater resources to pay damage claims. As a result, claims made against hospitals tend to pay larger damage settlements than claims made against physicians.

Hospitals, like physicians, purchase insurance to cover their risk of paying damages as a result of medical negligence. Hospital systems generally self-insure for a certain amount of financial risk ("retained risk") and purchase insurance from MPL insurance companies for coverage of additional financial risk ("excess risk"). Importantly, regardless of whether the hospital retains a small or large portion of the damages, the damages are paid to the patient/plaintiff by the hospital and/or their insurance.

Physician employment complicates the relationship between hospital and physician medical liability risk. Physicians are increasingly becoming more closely affiliated with hospitals and more often are insured through the hospitals' self-insurance (and related reinsurance) mechanism rather than the commercial market. This joining of risk under a single insurance mechanism may have the effect of reducing the number of independent defendants spending on defense counsel, but the concentration of risk can also result in increased payouts for the hospital.

3.2. Maryland Medical Liability Environment

3.2.1 Maryland Hospital Excess Insurance by Various Metrics

In addition to the retained risk mechanisms, hospitals purchase excess MPL insurance (reinsurance) coverage. A variety of companies around the world provide excess insurance coverage. This excess insurance provides important financial protections for hospitals.

The amount of excess insurance requested by a hospital depends on the risk perceived by the hospital's management. The results of the Maryland Hospital Survey, perhaps not surprisingly, indicate that the larger the hospital (based on number of annual inpatient days, surgeries, births, etc.), the more risk the entity retains, and the more excess insurance coverage the entity requests from the market. The two main categories of hospital utilization that are linked to the amount of excess insurance purchased are outpatient visits and births. As the most common type of healthcare utilization, outpatient visits depict the amount of care being provided (i.e., it is a proxy for the size of the hospital). Births, on the other hand, are an important factor not because of how common they are (there were nearly 190 outpatient visits per birth in Maryland hospitals in 2019), but because of the MPL risk that births pose to hospitals. Internal and

[12] Punitive damages also exist but are rare and typically not a part of MPL cases.

external benchmarks suggest that an average birth has 100-to-150 times the MPL risk of an average outpatient visit.

Hospitals in Maryland, like other states, have access to several excess insurance providers. The results of the survey of hospitals indicate that at least 15 separate insurance company groups have sold medical professional liability excess coverage to hospitals in Maryland since 2010 (see Figure 1).[13] While certain carriers appear to have curtailed or reduced writing in Maryland, there have also been market entrants over the period. The total excess capacity purchased by survey respondents increased through policy year 2019. However, total insurance capacity purchased decreased in 2020 (see Figure 1, 2A, 2B, 2C). Based on commentary from survey respondents, the decrease in 2020 was due to market pressures as opposed to a desire to reduce insurance coverage.

In multiple examples, survey respondents have added excess insurance providers in order to cover excess layer(s) previously insured by a single provider. This situation is growing more common and it appears some excess insurance providers are not willing to take on the same level of risk that they had in the past. Hospitals are being forced to increase their retention of risk and/or the premiums paid for their insurance (often both) to a level that will draw new excess insurance providers into their program.

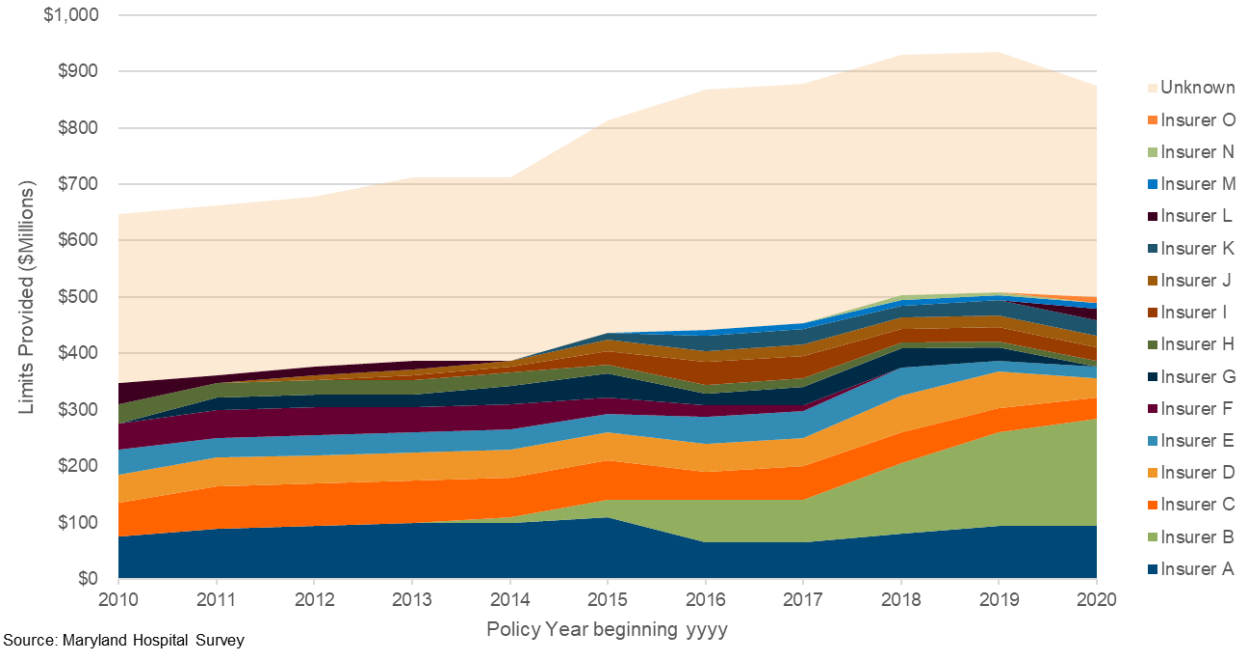
A specific example provides insight into the excess insurance provider's decision-making. One large global excess insurance provider informed one of the surveyed hospitals that they had decided to decline all new business from Baltimore City and County unless the hospital retained at least $25 million per claim. This had previously been a distinction only reached by Chicago, New York City, and Philadelphia. These areas are known to have some of the highest MPL cost environments in the country and Baltimore, it seems, has recently been added to the list.

Based on survey data where the excess carriers were identified, a significant portion of excess insurance limit capacity (nearly 60%[14]) is currently provided to Maryland hospitals by just two insurance groups (Figure 1). One of these carriers has been writing excess liability insurance in Maryland for many years, while the other is newer but has rapidly increased its presence and grown to become the insurance group with the most significant exposure in the Maryland market. The market in 2020 is more concentrated than it has been throughout the survey period; Maryland hospitals would likely struggle to maintain existing insurance levels if either of these two insurance groups were to decrease their participation in the market.

[13] Excess liability insurance is typically purchased on a health system-wide basis. Thus, a portion of the insurance limits purchased by some survey respondents also provide protection for exposure outside of Maryland.

[14] Based on the Maryland Hospital Survey and excluding cases where the specific insurer names were not provided, noted as "Unknown" in Figure 1. It is likely that those not reporting insurer names, use, at least to some degree, the same major insurers (A and B) as those who did report because these two insurers appeared on a large share of the populated reports.

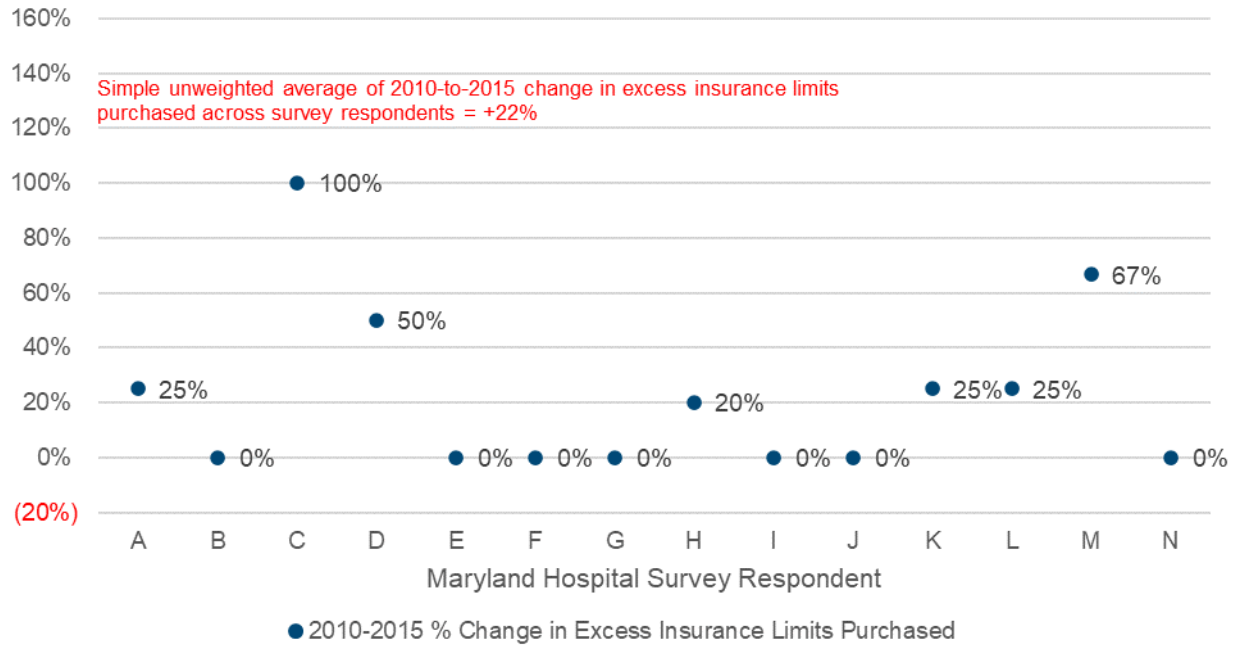
Figure 1. Excess Insurance Limits Provided to Maryland Hospitals



Source: Maryland Hospital Survey

Unknown: cases where the specific insurer names were not provided.

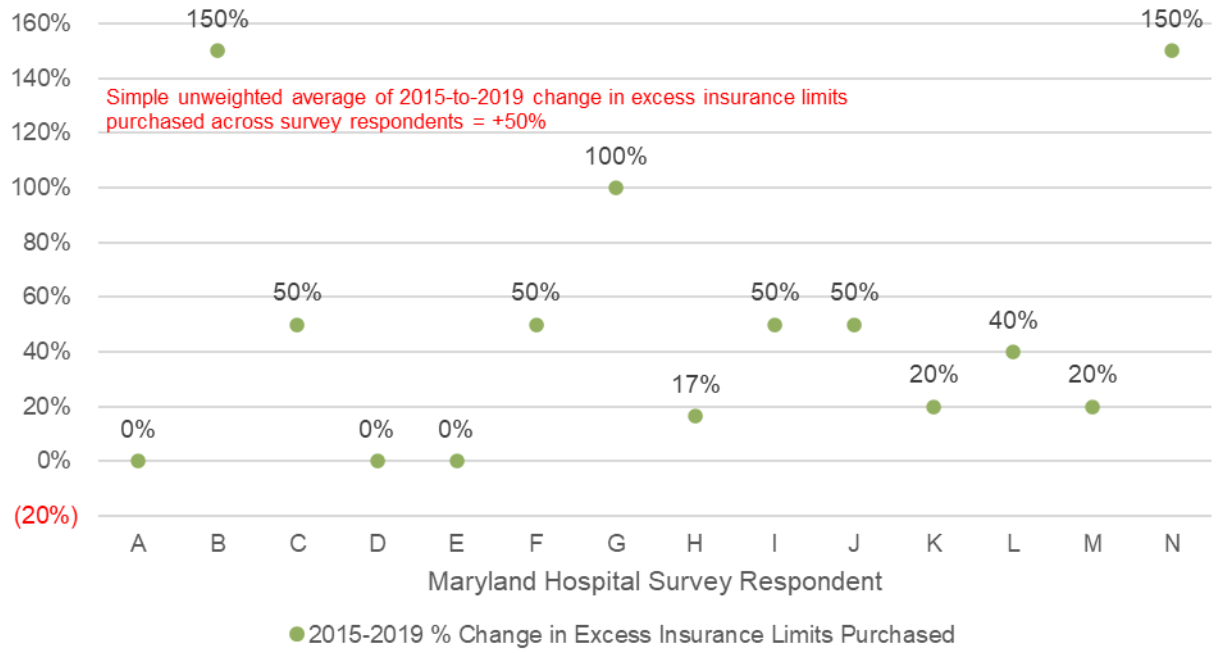
Figure 2A. Percent Change in Excess Insurance Limits Purchased between 2010 and 2015



Source: Maryland Hospital Survey

Note: survey respondents are summarized by system rather than individual facility.

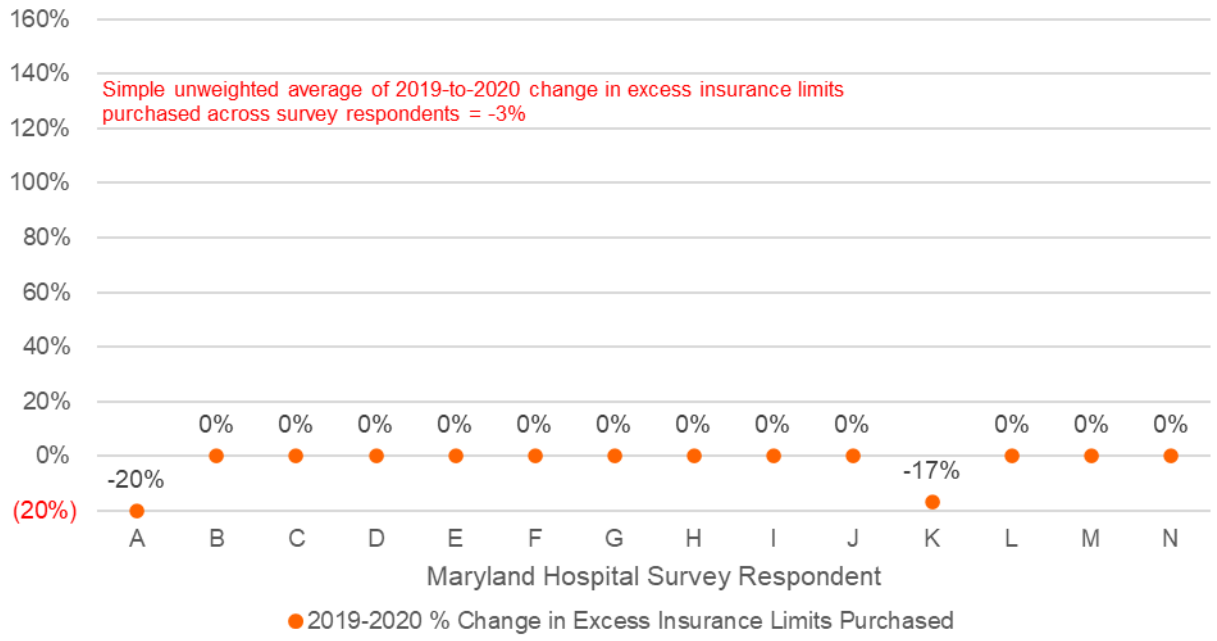
Figure 2B. Percent Change in Excess Insurance Limits Purchased between 2015 and 2019



Source: Maryland Hospital Survey

Note: survey respondents are summarized by system rather than individual facility.

Figure 2C. Percent Change in Excess Insurance Limits Purchased between 2019 and 2020



Source: Maryland Hospital Survey

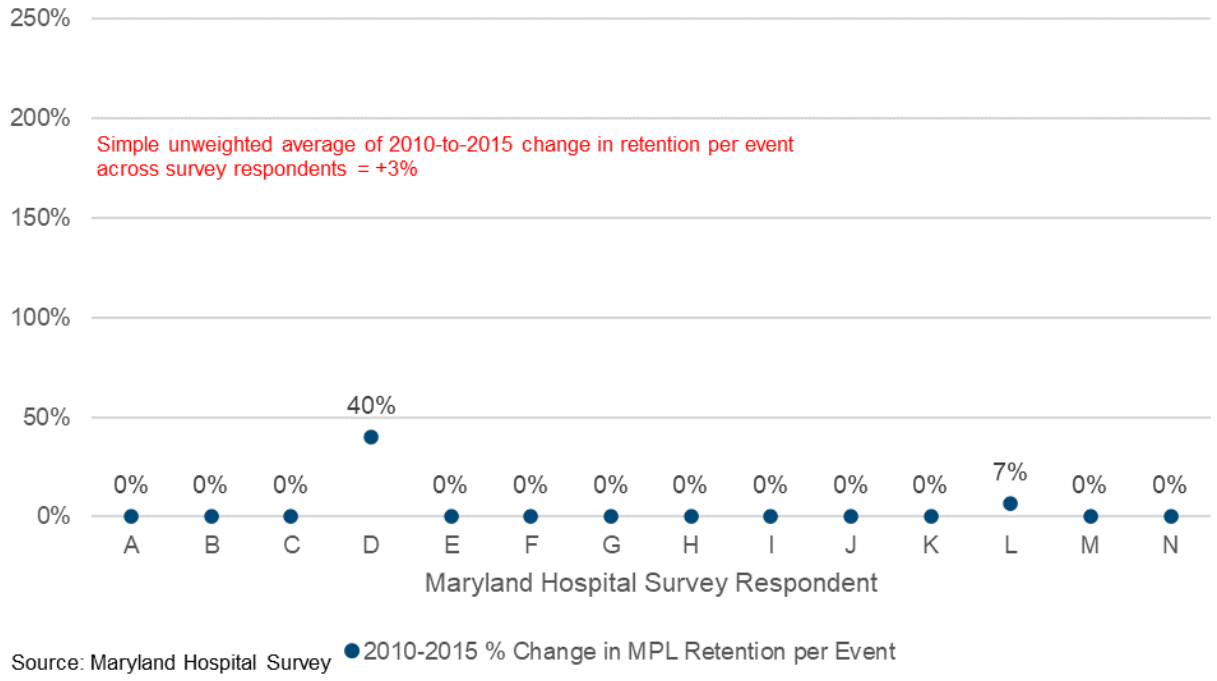
Note: survey respondents are summarized by system rather than individual facility.

3.2.2 Premiums

Maryland's hospitals are being required by excess insurers to retain more risk (Figure 3A, 3B, 3C) and hospitals are asking excess insurers to cover higher levels of damages (Figure 1, 2A, 2B, 2C). The relationship between hospitals and their excess insurers are, however, one-sided. The excess insurers are often nationwide or even global entities that can write policies only at specific premium levels, write them under specific conditions, or decline writing them altogether. Due to their diverse geographic reach, they can often set the tone of the relationship or simply decline to provide excess insurance coverage.

In a healthy and competitive excess insurance market, other excess insurers may limit the one-sided nature of this relationship by offering better or cheaper coverage than the incumbent insurer. The current excess insurance market, however, appears less competitive in recent years than it had been earlier in the survey period. Nearly every hospital that responded to our survey indicated an increase in their per event MPL risk retention in the last five years (Figure 3B, 3C). In addition, hospitals have been working to increase the amount of excess insurance coverage above the retention. The year 2020 appears to be an inflection point in which there were not enough excess insurers willing to write policies for the hospitals, causing a decrease in overall insurance coverage for the first time in at least ten years (Figure 1, 2C).

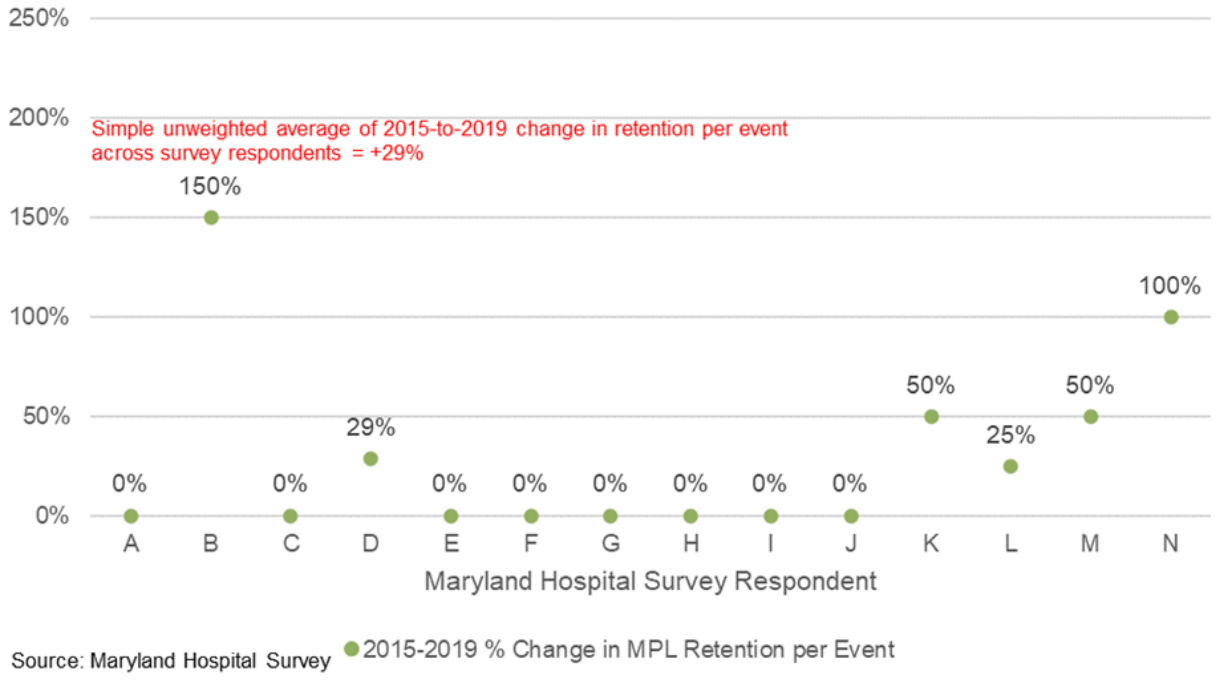
Figure 3A. Percent Change in Retained MPL Risk per Event between 2010 and 2015



Source: Maryland Hospital Survey

Note: survey respondents are summarized by system rather than individual facility.

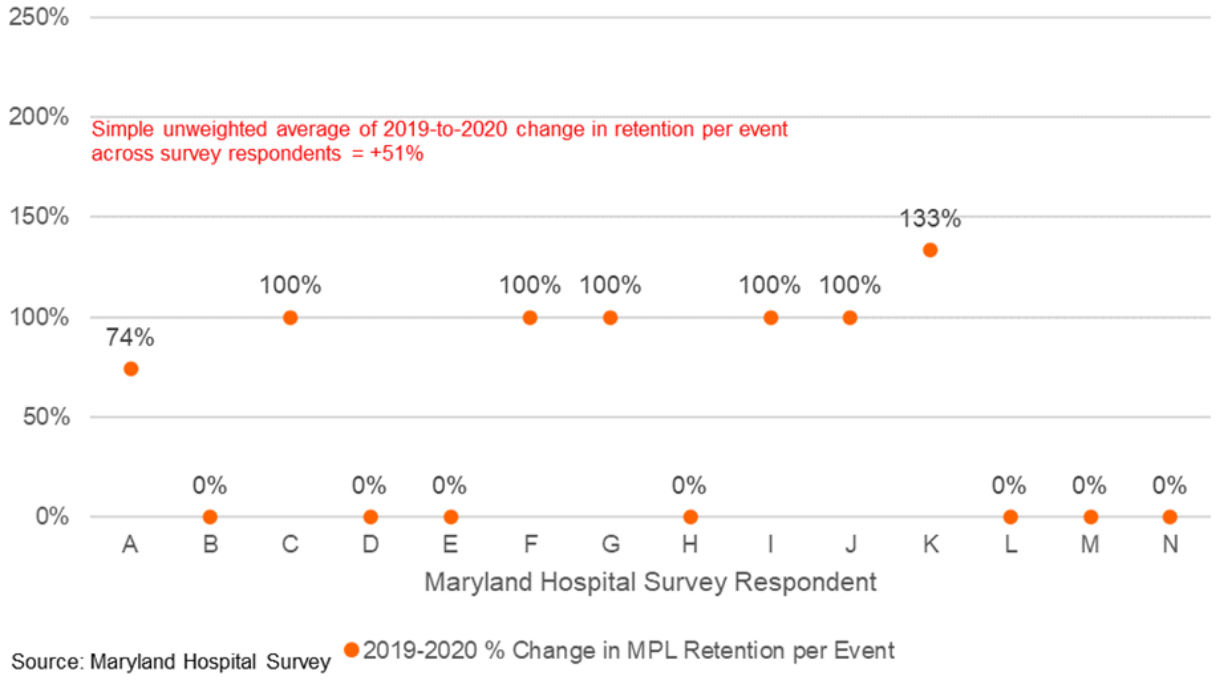
Figure 3B. Percent Change in Retained MPL Risk per Event between 2015 and 2019



Source: Maryland Hospital Survey

Note: survey respondents are summarized by system rather than individual facility.

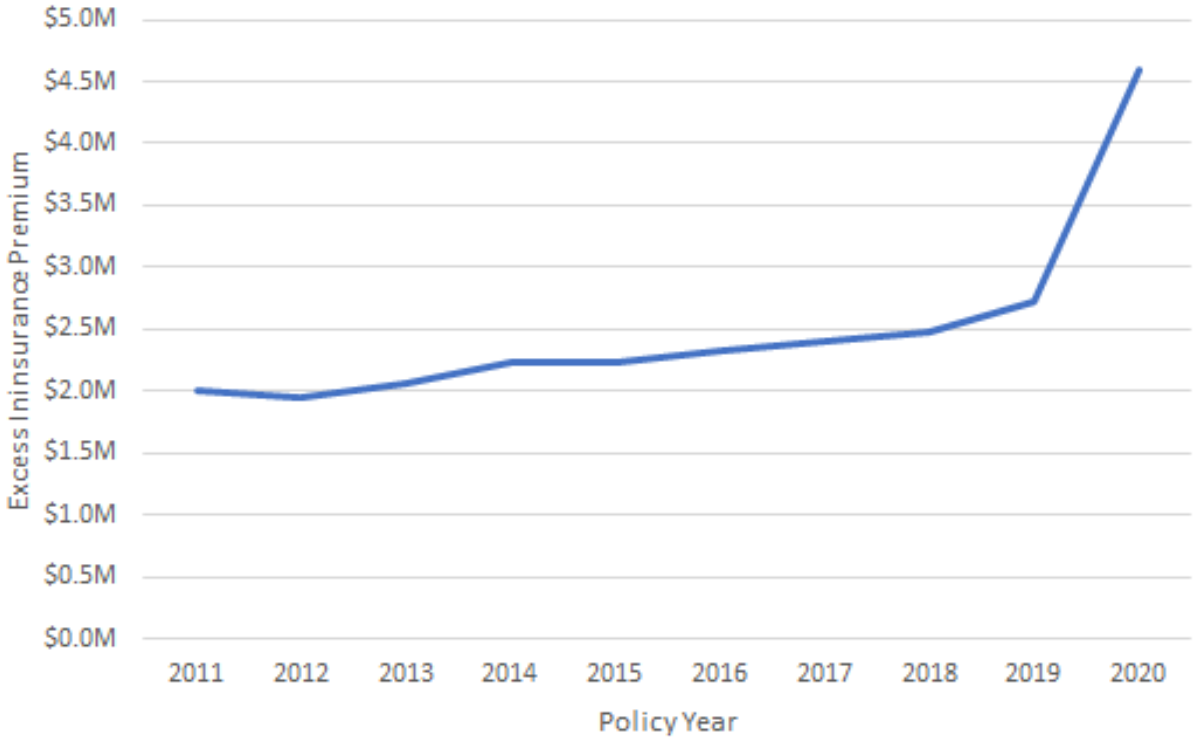
Figure 3C. Percent Change in Retained MPL Risk per Event between 2019 and 2020



Source: Maryland Hospital Survey

Note: survey respondents are summarized by system rather than individual facility.

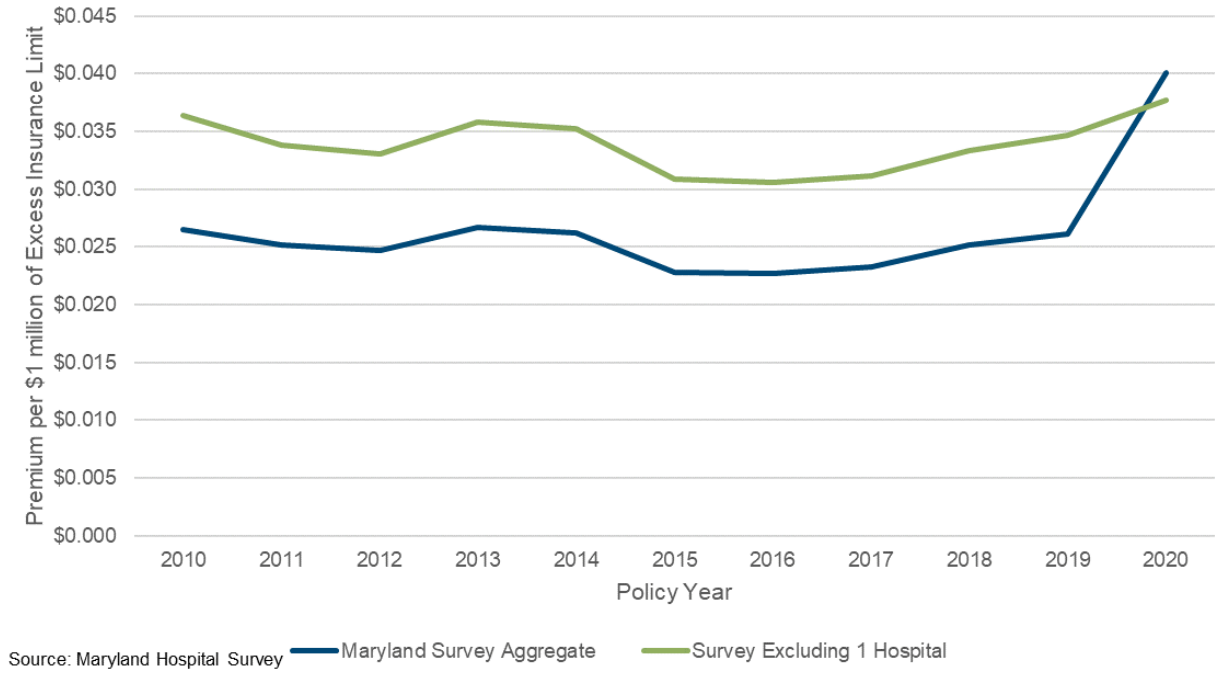
Figure 4. Excess Insurance Premium (Average per System, Weighted by 2019 Inpatient Days)



Source: Maryland Hospital Survey

These higher levels of coverage have a cost paid by hospitals in premium. As shown in Figure 4, excess insurance premium has increased significantly since 2011. A portion of these increases may be expected with the growth of hospital exposure (e.g., physicians included in the self-insurance program) and increased insurance capacity provided. However, the amount of risk retained by the hospitals has increased in recent years (i.e., insurer liability starts after a higher amount has been paid by the hospital out of pocket). Moreover, any additional insurance limits purchased are in excess insurance layers above what is already insured. That is, in the event of a loss, the hospital retention and existing layers of insurance would need to be exhausted first before the new layers of insurance make a payment. Thus, new higher layers of insurance should be available at a lower average premium. These factors should help control the overall average premium per $1 million of coverage provided, commonly referred to as the "rate on-line." Instead, survey respondents had a sharp increase in the rate on-line in 2020 (Figure 5). We note the sharp increase in rate on-line in 2020 is due to one system that had particularly significant increases in excess premium. Excluding this system from the averages would show an average annual increase in this statistic of 7% across the latest three policy years; the comparable increase including this hospital is 20%.

Figure 5. Excess Insurance Rate On-Line



Additionally, according to the survey, the damages covered by excess insurance policies are more restrictive than in the past due to various exclusions or coverage adjustments relating to:

1. Opioid risk
2. Cyber risk
3. Batch claims
4. Sexual molestation
5. COVID-19 coverage
6. Defense costs being included within the coverage limit

3.2.3 Maryland Hospital Retained Risk Mechanisms

Hospitals in Maryland, like hospitals throughout the country, rely on risk retention mechanisms for a variety of reasons, including:

1. Cost savings
2. Centralized risk management
3. Customized insurance coverages

Three of the most common risk retention mechanisms are captives, trusts, and risk retention groups. In fact, the Maryland Hospital Survey indicates that these three mechanisms account for the entirety of the Maryland market, with captives as the most common mechanism. There has been little to no change in this distribution in recent years. These mechanisms, in theory, allow hospitals to retain risk up to a level that they consider appropriate.

3.2.4 Comparing MPL in Maryland vs. Other US States

Increased employment of physicians by hospitals is one reason for the increase in Maryland premium (and overall risk). Survey results show that full time equivalent physicians insured by the hospital's self-insurance mechanisms increased by 33% from 2011-2020. This trend towards physician employment has been occurring for some time and is not unique to Maryland. On the other hand, hospital utilization is declining in Maryland relative to the rest of the country. The following table summarizes the change in various hospital utilization categories from 2013-2019 (years selected based on available data).

Table 2. Percent Change in Healthcare Utilization between 2013 and 2019

Category	Maryland	United States (excl. Maryland)
Inpatient Days	(4.2)%	0.6%
Total Beds	(7.7)%	(2.0)%
Births	(5.6)%	(4.9)%
ER Visits	(10.9)%	7.6%
Surgeries	(6.8)%	8.9%
Outpatient Visits	7.9%	14.1%

Source: AHA healthcare utilization data

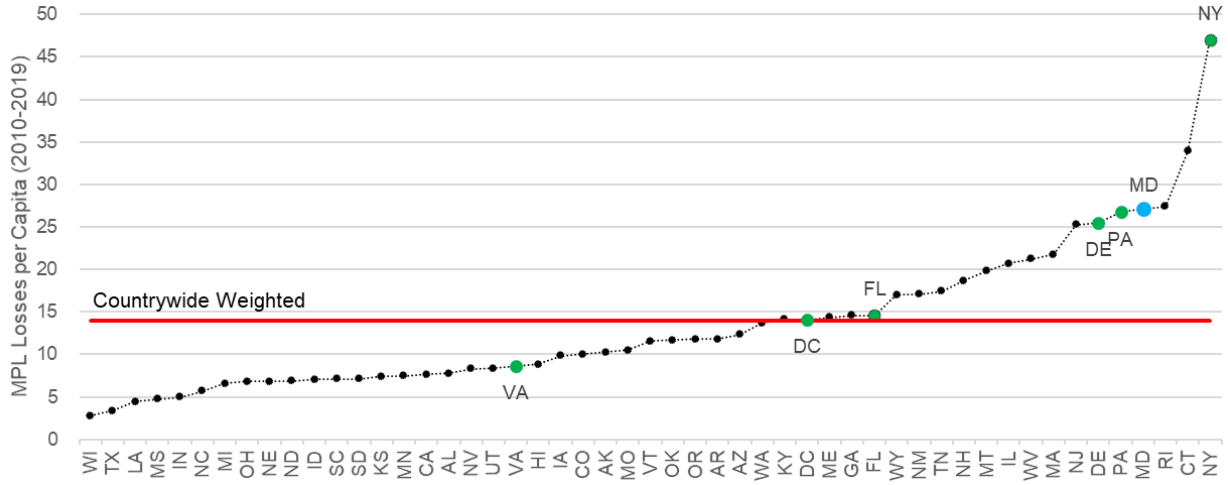
These differences may be due to population change over this period (cumulative 2.1% growth for Maryland versus 3.9% for the rest of the United States) as well as Maryland's unique all-payer rate-setting system for hospital services. Since 2014, Maryland has implemented a state-wide hospital global budget payment program with the goal of controlling hospital use and spending.[15] Further analysis would be needed on the causes of decreased utilization in Maryland to understand the impact it would have on MPL risk (this type of analysis goes beyond the scope of this report).

Although we do not have as detailed data on excess insurance costs or excess layers in other states, we have data on retention levels. Milliman internal benchmarking data suggests that per-claim retention levels have been rising around the country, but at a measured pace. As noted in the prior section, surveyed Maryland hospitals have had a significant increase in retention in recent years (see Figure 3A, 3B, 3C).

We can also make certain comparisons to other states based on publicly available data. One such metric is MPL cost per capita. The numerator of this metric, MPL costs, are summarized from NAIC Insurance Company Annual Statement data and are calculated as the total of all direct losses paid as reported in the Annual Statement Exhibit Supplement A to Schedule T. Paid losses were used in lieu of collected premium to avoid pricing (e.g., profit margin or dividend) differences that may exist between states. The denominator, population, was retrieved from Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico, U.S. Census Bureau, Population Division. Figure 6 shows the total MPL paid losses per person in each state over the last ten years.

[15] https://innovation.cms.gov/innovation-models/maryland-all-payer-model

Figure 6. Total MPL Costs Per Capita between 2010 and 2019 (NAIC Insurer Data Only)



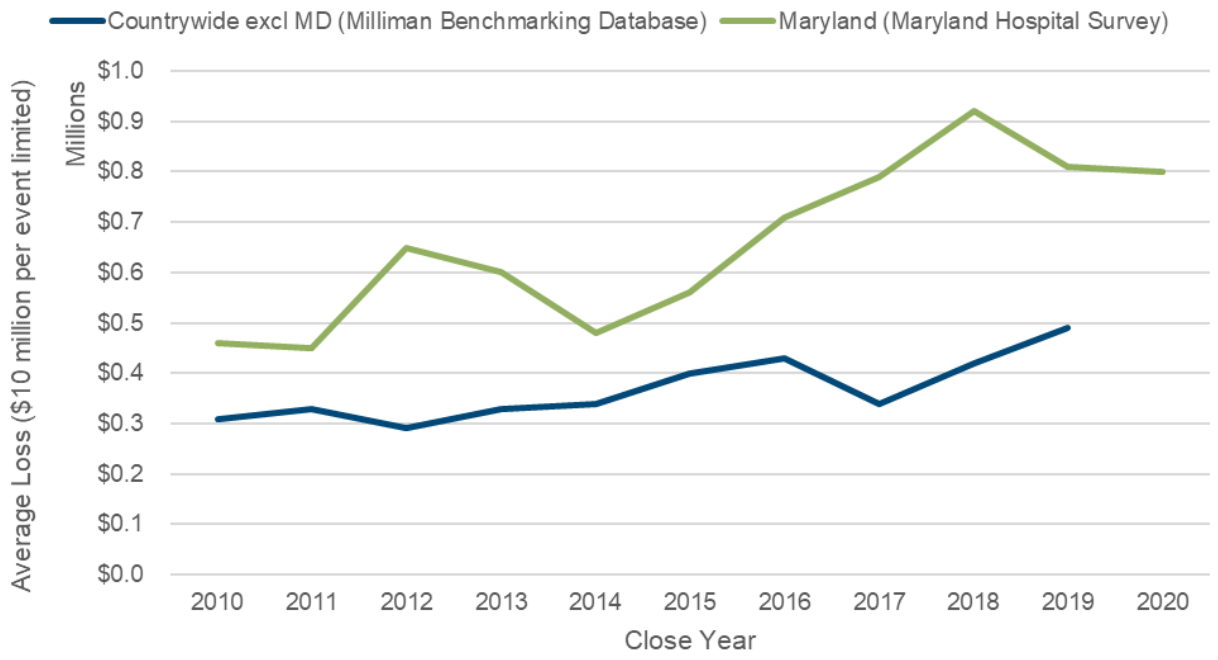
Source: NAIC Insurance Company Annual Statement data and U.S. Census Bureau population data

Importantly, this metric represents only a fraction of the MPL market since it excludes most retained risk mechanisms, offshore excess insurance, and payments made through state-administered funds. All states have more MPL costs than calculated in Figure 6, but states with birth injury funds (i.e., Virginia, Florida and New York), PCFs, or excess liability funds may be biased low relative to other states. The ranking of states by cost in Figure 6 may change if we were able to accurately adjust for this missing data for each state.

Caveats aside, Figure 6 demonstrates the high insured MPL costs in Maryland relative to states around the country. Nearby Delaware and Pennsylvania narrowly trail Maryland using this statistic. Washington, DC is close to the countrywide average while Virginia has lower costs (note however that payments made by the Virginia birth injury fund are not included in this dataset).

The most significant contributor to higher overall costs in Maryland appears to be the size of claims. The average size of a hospital professional liability loss payment between 2010 and 2020 (limited to $10 million per event in order to reduce the influence of very large claims) is 75% larger in Maryland than countrywide statistics based on internal Milliman data (Figure 7).

Figure 7. Average Severity by Close Year (Claims Closed with Indemnity Only, Loss Limited to $10 Million per Event)



Source: Maryland Hospital Survey and Milliman internal MPL benchmarking database

4. Programs for Reducing MPL Costs Utilized in Other US States

4.1. Governmental Funds

Maryland does not currently have a state administered MPL fund like those that may be seen in other states, such as a birth injury fund, patient compensation fund, or excess liability fund. Below, we describe how each of these funds work and discuss some of the states that offer them.

4.1.1 Birth Injury Funds

Birth injury funds were created by Florida and Virginia in the late 1980s to keep the most expensive (infant neurological) cases out of the court system.[16] Birth injury funds in Florida and Virginia are funded by assessments/fees from physicians and hospitals in the state. Virginia also collects assessments from MPL insurers operating there. In both Florida and Virginia, the funds collected from these assessments are pooled into a state-run fund. When a birth injury occurs (and is reported within a defined statute of limitations), instead of suing the hospital and/or physician(s) the claimant files an application with the fund. If that application is accepted as a qualifying birth injury, the fund compensates the claimant for the injuries by providing medical care. As a result, no malpractice claims can be filed.

The presumed benefits to health care providers from a birth injury fund include:

1. Reduced legal fees since the claims are handled outside the tort system
2. Reduced insurance premiums because of lower costs to excess insurers

Patients may also benefit from a birth injury fund due to the nature of the claim process:

1. These funds have typically been designed as "no-fault" funds, meaning that the injured party does not need to prove that negligent care was provided to access the fund
2. Since the fund is outside of the tort system and the "no-fault" standard exists, the timeline for receiving compensation is often improved

Opponents of this type of fund argue that it:

1. Limits patient access to the court system
2. Will result in increased expenses in order to manage the program
3. Shifts the funding of liability from a defendant to others who are not responsible for the injury
4. Creates a bureaucratic system for benefits and requires an ongoing claim process for injured parties
5. Diminishes providers' incentives to adopt best practices for injury prevention by removing negligence[17]

More recently, New York created a birth injury fund, however, it functions differently than the funds in Florida and Virginia. The three primary differences are 1) the claims are brought using the tort system instead of through an independent administrative system; 2) there is a broader definition of a valid injury; and 3) the fund is financed through a state budget allocation.

[16] https://www.vabirthinjury.com/why-the-birth-injury-program/

[17] "Most studies in this review found no association between greater risk of malpractice liability and health care quality" (https://jamanetwork.com/journals/jama/article-abstract/2759478).

Per the Maryland Hospital Survey, 42% of hospital paid losses since 2010 have been a result of claims from obstetrics/gynecology. Detail was not available to determine what portion of these losses would have been covered by a potential birth injury fund, since the funds as used in Florida and Virginia cover only neurological birth injuries. However, we were able to define some of these claims as permanent and significant birth injuries more generally. While a rare event, claims for permanent and significant birth injuries are the most expensive in Maryland, representing 3% of overall claims but 28% of total loss payments in the 2010 through 2020 period. They represent 18% of loss payments when reviewing losses limited to $10 million per event. The Maryland Hospital Survey shows that claims for permanent and significant birth injuries that result in a loss payment also have far higher average legal defense expenses than claims for other injury types with loss payments. Providing a separate funding source for these potentially large claims through a birth injury fund would reduce the uncertainty inherent with hospital MPL risk retention. Since these claims make up a disproportionate amount of loss payments from excess insurers, a birth injury fund should also reduce the costs of excess insurance.

Exhibit 6 through Exhibit 15 provide detail on claims data from the Maryland Hospital Survey database by hospital department and injury type. There were a wide variety of injury and department types provided in the survey responses. We grouped the injury and department types into broader categories based on similar attributes of the provided fields in order to compare claim types and analyze trends. In order to assign injury type to the claims provided in the Maryland Hospital Survey, we relied on a combination of the "claim type identifier" and "hospital department responsible" fields included in the survey. Specifically, to identify permanent and significant birth injury claims, we looked for key words in injury types such as permanent grave, permanent significant, permanent major, or brain injury. Certain injury codes included indicators such as "neonatal" or "birth injury", which lead us to flag the claim as a birth injury claim. In some cases, we first flagged claims indicating OB/GYN or labor and delivery as departments, and if one of the injury types mentioned previously was also present for the claim, we considered this a permanent and significant birth injury claim.

4.1.2 Patient's Compensation Funds (PCFs)

PCFs are currently used by seven states, many with their beginnings in the mid-late 1970s. These funds, unlike birth injury funds, do not replace the existing tort system nor the MPL negligence standard. Instead, these funds guarantee the availability of MPL insurance to healthcare providers in the state, functioning as reinsurance in excess of a primary insurance policy at some state-defined amount. In Indiana, for example, both individual practitioners and institutions alike get primary coverage up to $500,000 then all excess coverage is provided by the PCF. Due to Indiana's total damage cap of $1.8 million, the PCF is responsible for up to $1.3 million of coverage as the state's de facto excess insurer. Like birth injury funds, however, the fund is financed by surcharging physicians, hospitals, and other healthcare providers in the state.

A summary of PCF states and their attachment points (dollar amount at which the PCF starts paying losses) is included in the following table:

Table 3. PCF Attachment Points

State	Attachment Point (Per Event)
Indiana	$500,000
Kansas	$300,000
Louisiana	$100,000
Nebraska	$500,000
New Mexico	$200,000
Pennsylvania	$500,000
Wisconsin	$1,000,000

Several other states have had PCFs in the past but the PCFs have been disbanded or are currently inactive. Most recently, South Carolina's PCF was dissolved due to a resurgence in non-government funded insurance availability. The fund's outstanding liabilities were transferred to a new entity on January 1, 2020. According to the Independent Insurance Agents & Brokers of South Carolina, "the South Carolina Joint Underwriting Association in combination with the PCF became the primary market for med mal coverage in South Carolina. However, the private insurance market has returned for med mal coverage putting a strain on [these organizations] to remain stable (https://www.iiabsc.com/News/Pages/Newsletters-Publications/AgentNews/2019/JUA.aspx).

4.1.3 Excess Liability Funds

In addition to its birth injury fund, New York has an excess liability fund. This fund is different than a PCF in that it is financed through tax dollars instead of healthcare provider surcharges. However, in most other ways New York's Excess Coverage Fund functions like the PCFs described above. The per claim attachment point for New York's excess liability fund is $1.3 million.

4.2. *Revisions to MPL Tort Law*

There are several widely accepted tort reform mechanisms used throughout the United States to curb MPL costs. The American Medical Association lists the following:[18]

1. Damage caps
2. Limited attorney fees
3. Collateral source reform
4. Joint liability reform
5. Permission to use periodic payments
6. Arbitration, mediation, and pretrial screening panels
7. Expert testimony qualifications
8. Affidavits and/or certificates of merit
9. Statute of limitations

The focus of this section will be on items 1 through 3 since we believe them to be the most impactful to MPL tort reform.

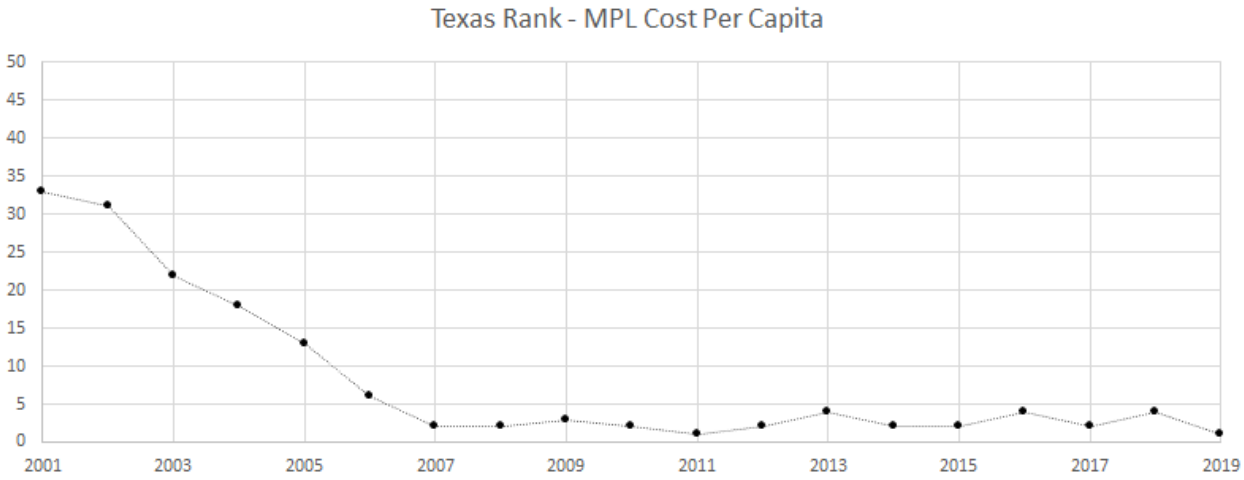
4.2.1 Cap on Damages

Damage caps have been an integral part of tort reform for decades. They vary in their types and amounts depending on the state in which they reside. The cap may apply to non-economic and/or economic damages and in some cases exclude future medical expenses. A summary of current and historical damage caps is shown in Exhibit C4.

Most damage caps are for non-economic damages only. The most stringent of these caps exists in Texas, where a non-economic damage cap of $250,000 was written into the state constitution in 2003. Although other states also have damage caps at $250,000 (most notably California), the constitutional element of the Texas cap makes it nearly impossible for the courts to overturn. As Figure 8 shows, Texas has outperformed other states in MPL costs per capita since the cap was created and has been in the five lowest cost states for this metric since 2007.

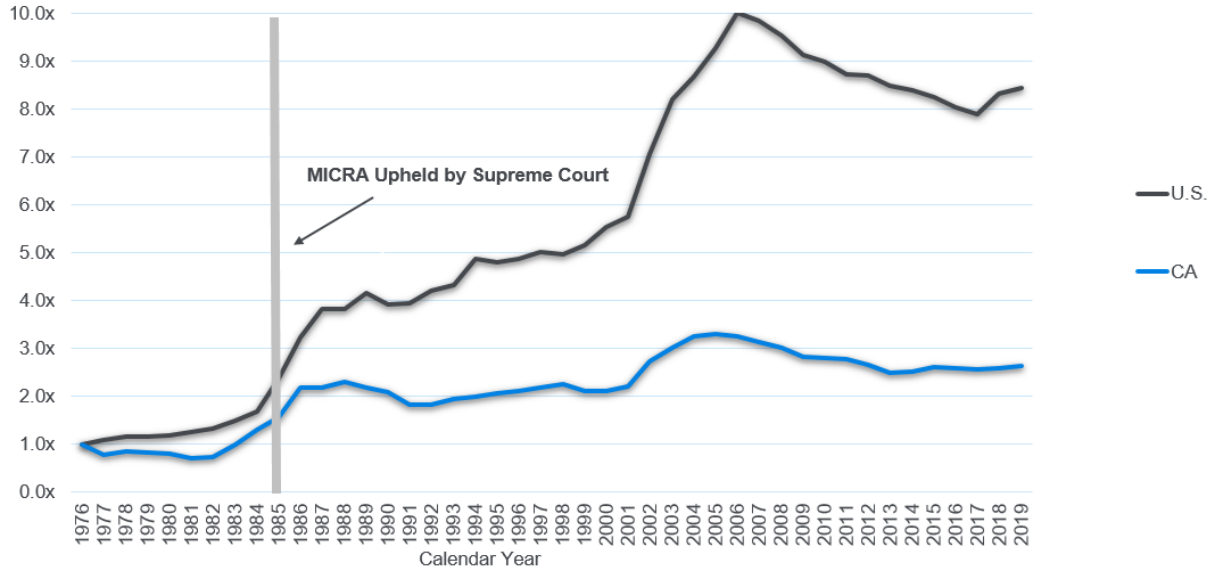
[18] https://www.ama-assn.org/practice-management/sustainability/state-medical-liability-reform

Figure 8: Per Capita MPL Costs – Texas Rank Relative to Other States



California's MICRA also includes a $250,000 cap on non-economic damages (in place since 1975 with no inflation adjustment). The figure below shows that from 1976 to 2019, MPL premiums as reported to the NAIC have increased by a factor of 8.4 for the US as a whole (annual average increase of 5.1%), while in California they have increased by a factor of 2.7 (annual average increase of 2.3%).

Figure 9: California vs. US NAIC MPL Premiums (Growth Relative to 1976 Premium)



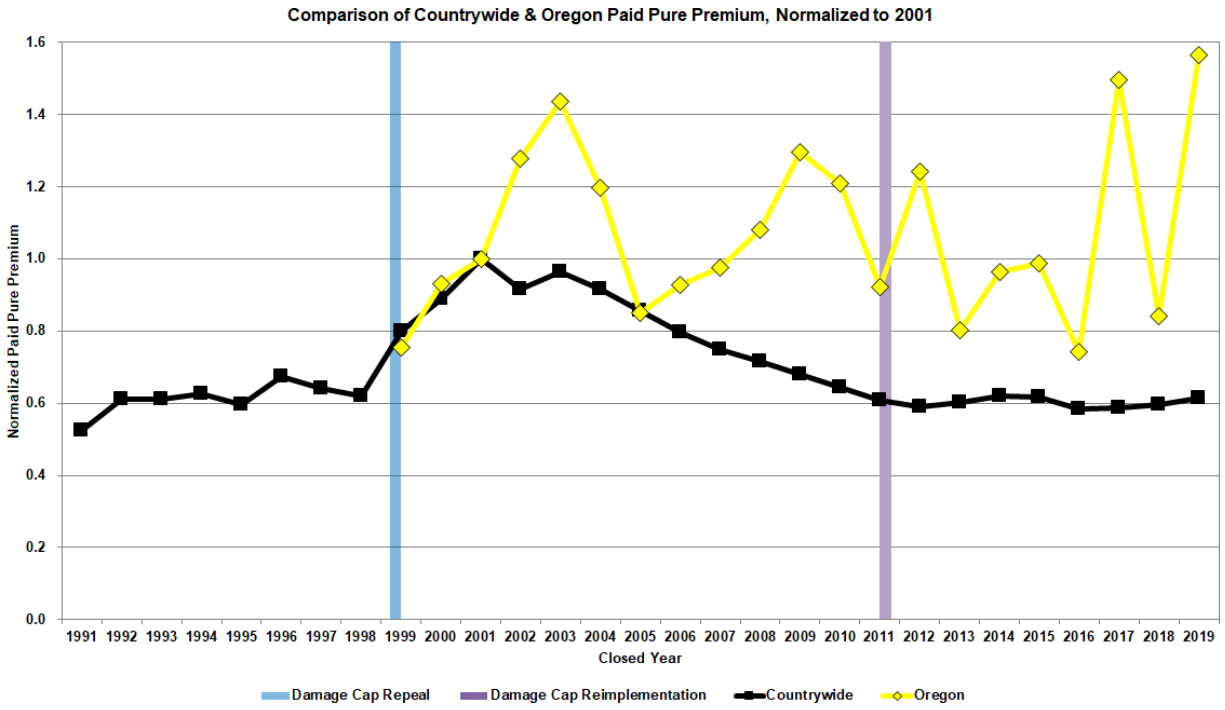
Source: NAIC Insurance Company Annual Statement data

Oregon, on the other hand, has both repealed and implemented damage caps in recent years. In 1999, the state Supreme Court struck down the state's $500,000 non-economic damage cap that had been in place for nearly three decades.[19] A few years after the repeal (it takes several years for many MPL cases to resolve), costs began to increase more rapidly than national trends. In 2011, the state legislated a new cap, albeit more limited in scope. The 2011 cap was a $500,000 non-economic damage cap that applied only to wrongful death cases. This cap was struck down as unconstitutional by the Oregon Supreme Court in

[19] https://www.ama-assn.org/practice-management/payment-delivery-models/how-oregon-s-top-court-erred-striking-down-noneconomic

2020. The 2011 cap for wrongful death only did not appear to be decreasing MPL paid losses in Oregon while it was active (Figure 10).

Figure 10: NPDB Paid Losses per Physician – Oregon vs Countrywide



Maryland currently has a non-economic damage cap in place, which increases by $15,000 each year. The cap is at $845,000 for medical liability events that occur in 2021 ($1,056,250 for wrongful death cases filed with two or more beneficiaries). This is among the highest non-economic damage caps in the United States, although nearby Virginia's total (non-economic plus economic) damage cap is currently more than $2 million (Exhibit C4). Various studies have shown that "damages caps reduce liability insurance premiums."[20]

4.2.2 Collateral Source Exceptions

Collateral source reform allows the defendant (or the defendant's insurer/reinsurer) to reduce the damages paid to a claimant based on the amount paid by other sources available to the plaintiff (such as paid medical insurance claims or unemployment benefits). Typical collateral source rules do not allow evidence that the plaintiff or victim has received compensation from some other source to be brought to reduce damages sought against the defendant. Maryland operates under typical collateral source rules for medical professional liability cases.

Under Maryland's current MPL system, the third parties that provided payment can ask for reimbursement from the claimant (through a lien for example) once the damages have been paid. With the collateral source exception, the liability settlement is reduced by the amount of third party payments and those third parties are not reimbursed. The net impact is that the claimant should receive the same total benefit (i.e., their relevant medical expenses are paid for), but the entity(ies) funding those benefits changes.

[20] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2690332/

For example, if a jury were to award a plaintiff $2 million and the plaintiff had already received an equivalent of $500,000 in compensation, the $500,000 could be subtracted from the $2 million when determining the defendant's payment. The $500,000 of collateral sources may have been provided by the defendant in free follow-up visits/surgeries, coverage from the plaintiff's medical insurance, unemployment benefits, or any number of other sources depending on the state's statute.

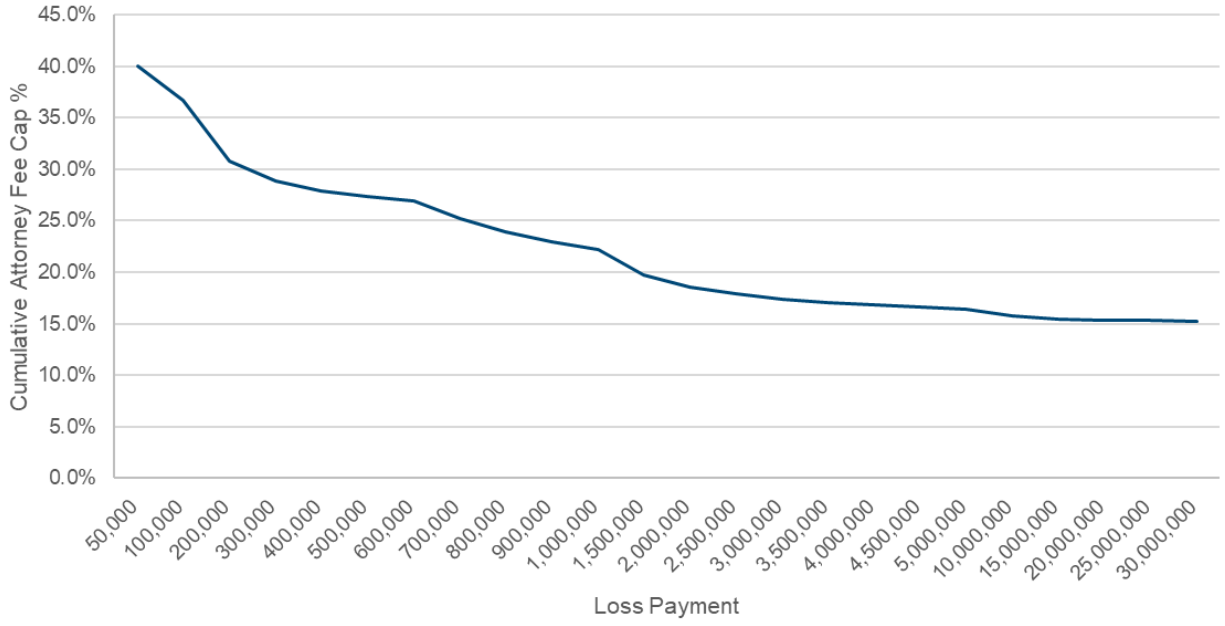
Since attorney fees are typically calculated as a percentage of the award, the plaintiff attorney will likely receive less in fees if the award is reduced for other collateral sources. This may have an impact on the attorney's decision to take on a case.

4.2.3 Limits on Attorney Fees

Proponents of limiting attorney fees note that by limiting the percentage of the award that an attorney can receive, the plaintiff receives a larger percentage of the awarded damages. Alternatively, opponents may note that capping an attorney's fees may limit access to the tort system. If the potential fees for an attorney in an MPL case is limited, the risk/reward appetite for an attorney may shift, resulting in fewer MPL cases brought against healthcare providers.

Maryland currently has no limits on the amount of fees an attorney can collect in MPL cases. States that limit fees typically vary their limits by the size of the award. For example, California limits attorney fees to 40% of the first $50,000 of damages awarded, 33.3% of the next $50,000, 25% of the next $500,000, and 15% for any amount exceeding $600,000. This is presented graphically in Figure 11 showing the cumulative fee % based on the loss payment.

Figure 11: Sliding Scale of MICRA Maximum Plaintiff Attorney Fee %



The respondents to the HSCRC Liability Survey provided detail on closed claims from 2010 through 2020 representing over 2,500 claims and nearly $1.9 billion of loss payments.[21] Table 4 below shows the implied amount of attorney fees this data represents assuming typical plaintiff attorney fees of 30% in Maryland versus if the California MICRA limits on attorney fees was applied.

[21] As discussed earlier, survey respondents represent approximately 80% of inpatient days and 65% of annual obstetric deliveries in the state of Maryland.

Table 4. Implied Attorney Fees on HSCRC Liability Survey Data, MICRA Plaintiff Fee Limits versus 30%

Layer of Loss	Loss Payments ($Millions)	Plaintiff Attorney Fees ($Millions)	
		30%	MICRA Limit
$0-to-$50,000	$107	$32	$43
$50,000 to $100,000	$104	$31	$34
$100,000 to $600,000	$596	$179	$149
Excess $600,000	$1,087	$326	$163
Total	$1,894	$568	$389

4.3. Impact of Implementing MICRA Provisions on Maryland's MPL Climate

There are several aspects of current California MPL tort law that would be applicable if Maryland were to implement California's tort law:

1. Non-economic damages are capped at $250,000 per occurrence. This cap has been in place since the California legislature passed the Medical Injury Compensation Reform Act ("MICRA") in 1975. MICRA was passed as a response to a crisis in the availability and affordability of MPL coverage in the state. The law allows for unlimited economic damages, as quantified using medical expenses, lost wages, or other economic losses.
2. The cap is applied after the jury has reached its verdict and judges are prohibited from instructing juries about the cap on damages.
3. Attorney fees are limited by a sliding scale that declines as a ratio to indemnity for higher layers (i.e., larger indemnity payments).
4. Evidence of collateral source recoveries is allowed, and private health insurers are not permitted to seek recovery for amounts they have paid related to the underlying medical event.
5. Indemnity payments are permitted to be paid periodically if agreed to or awarded as such.
6. A statute of limitations governs the time period during which suits may be filed.

Further information regarding the tort law under MICRA can be found in a summarized "MICRA Manual" prepared by Horvitz & Levy LLP.[22] A comparison of Maryland's current tort environment compared to California's tort environment under MICRA is shown in the table below:

[22] https://www.horvitzlevy.com/R5FD3S351/assets/files/News/2018MICRAManualwCover.PDF

Table 5. Maryland's Current Tort Environment vs. California's Tort Environment under MICRA

Component	Maryland	California
Cap on Non-Economic Damages	$845,000 or $1,056,250 for wrongful death claims with two or more beneficiaries	$250,000
Attorney Fees	Unlimited	Based on sliding scale by layer of indemnity
Collateral Source Rule	CSR Applies	Exception to the CSR
Periodic Indemnity Payment	Allowed	Allowed
Statute of Limitations	3 Years	3 Years

The scope of our analysis was to estimate the impact on MPL costs for Maryland Hospitals if California's tort environment under MICRA were to be implemented. In this regard, we have considered the possible financial impact of each of the items listed above. In doing so, we have contemplated both frequency[23] and severity[24] impacts.

We estimate that implementing MICRA would result in a 23% decrease in the overall indicated loss cost for hospitals in Maryland. The table below breaks the overall change into frequency and severity components (also shown in Summary Exhibit 1):

Table 6. Projected Decrease in Hospital MPL Costs in Maryland Under Implementation of MICRA

Component	Value
Impact of Exception to Collateral Source Offset	7%
Impact of Decrease in Cap on Damages	13%
Impact of Claim Frequency	5%
Indicated Decrease in Loss Costs	**23%**

Source: Summary Exhibit 1

Note that each of the above scenarios considers the impact on an unlimited basis (i.e., regardless of purchased insurance policy limits). Additionally, the projected impact is based on hospital data specifically and does not account for the impact to physicians' medical professional liability. As discussed previously, physicians and hospitals tend to experience different average claim severity, with the typical independent physician purchasing $1 million per event limit policies versus the tens or hundreds of millions in self-insured and insured limit of a hospital. The results presented here should not be interpreted as a potential impact to the entire medical professional liability market in Maryland, but rather, impact to hospital liability specifically. The proportional impact to physician costs would be less significant.

There are several ways in which the costs associated with MPL coverage would be impacted if the provisions of MICRA were enacted:

[23] "Frequency" is an actuarial term denoting the measure of events relative to an underlying volume of exposure, such as premium or the number of physicians.

[24] "Severity" is an actuarial term referring to the average cost per event.

1. Events that are settled or go to trial and for which a verdict is rendered would incur lower loss payments, primarily due to the exception to the CSR and the decrease in the cap on non-economic damages.
2. Given the lower indemnity payments, plaintiff attorneys may be less financially motivated to incur additional expenses such as expert witnesses to support the amounts on which these payments are based. Hence, hospitals would incur lower defense costs in defending against these arguments.
3. The number of events reported and indemnified can be expected to decrease. This results from the lower incentive for plaintiffs and plaintiff attorneys to file claims, as they would expect lower loss payments. Additionally, if attorney fees are capped as under MICRA, there will be less incentive for plaintiff attorneys to pursue claims.

Item (1) above represents a decrease in indemnity severity (i.e., average indemnity claim cost) and item (2) can be characterized as a decrease in defense cost severity. Last, item (3) is a decrease in claim frequency.

In analyzing the projected impact of MICRA we have considered the possible impact of each area of the act in light of the above description of how loss costs may decrease. Our considerations on addressing each of the provisions in the sequential order that our analysis reviews the impacts are:

1. Exception to the CSR – we have estimated the impact of this change based on a size of loss model for Maryland events, information available from the Louisiana PCF on medical losses, and information on the percentage of claimants where the exception to the CSR may apply. This is discussed further below.

2. Decrease in the cap on non-economic damages – our approach to analyzing the impact is based on a size of loss model and Monte Carlo simulation discussed further below.

3. Prohibiting instruction of the jury about the cap on damages – this provision is consistent with current Maryland law and we therefore have not made any adjustments in our analysis for this impact.

4. Limiting attorney fees based on a sliding scale by indemnity layer – we expect that this would likely result in a decrease in the total amount of attorney's fees, given the current unlimited nature of the fees in Maryland. Under typical practice and current interpretation of MICRA, attorney fees are calculated as a share of the indemnity payment. Under this interpretation, the total indemnity payment would not be impacted, but the share of the total paid to the attorney may be impacted. For this reason, we have not estimated any impact to the severity of losses for this component, but have included this component in the frequency impact as discussed further below.

5. Indemnity payments are permitted to be paid periodically if agreed to or awarded as such – we have made no estimate within our analysis of an impact from this provision. Currently in Maryland, courts or arbitrators can order periodic payments.

6. Implementation of statute of limitations – Maryland currently has a 3-year statute of limitations like MICRA, so we have not made any adjustments for this component.

Hence, based on the above, our analysis consists of the impact on loss costs (i.e., the indemnity and defense costs within MPL rates) within the following three areas. We have performed our analysis for these areas:

1. The implementation of the exception to the CSR.

2. The decrease in the cap on non-economic damages and resulting impact to claim frequency.

3. The impact of limits on attorney fees.

4.3.1 Impact of the Collateral Source Rule

Under MICRA, there is an exception to the CSR. This exception has been in place since 1975. We have estimated the impact of implementing this exception in the Maryland environment based on the distribution of MPL claim payments in Maryland and information from other publicly available sources on medical losses on MPL claims.

Table 7. Projected Decrease in Maryland Loss Costs due to the Exception to the Collateral Source Rule Under MICRA

Component	Projected Decrease
Indemnity	7.1%
ALAE	4.2%
Indemnity and ALAE	**7.0%**

Source: Exhibit A1

Indicated Decrease in Severities Due to the CSR

Exhibit A1 shows the projected impact of the exception to the CSR. To calculate this impact, we have first estimated the portion of medical losses on an MPL event under the CSR as shown in Exhibit A3. This is based on publicly available data from the Louisiana PCF. As noted previously, the CSR applies to MPL cases in Louisiana and the Louisiana PCF is the only publicly available source of medical versus indemnity costs on MPL cases of which we are aware.

We also estimate the average medical cost per claim in Exhibit A3. We rely on this amount together with other information in Exhibit A2 to estimate the portion of medical costs paid by private health insurance on MPL events when the CSR is present. We understand that under MICRA, a right of recovery for medical costs currently exists for anyone who is uninsured. We further understand that amounts incurred by Medicare, Medicaid, or a self-funded ERISA health plan are typically included by plaintiff attorneys in their requests for damages as these entities maintain the right of recovery against damages awarded. In addition, it is our understanding that only past medical damages apply to the collateral source rule exception.[25] We have relied on publicly available data from the Louisiana PCF to estimate the percentage of medical costs related to past versus future costs. This information is summarized in Exhibit A4. Consequently, the percentage estimated in Exhibit A2 represents the portion of medical costs that are currently included in damage estimates by plaintiff attorneys in Maryland but would not be under MICRA rules.

We combine these percentages in Exhibit A1 to estimate the reduction in MPL indemnity costs from the exception to the CSR. For modeling purposes, we have applied the reduction in costs to the economic portion of the losses since medical payments fall under the economic loss categorization. We believe there would also be a decrease in defense costs if the exception to the CSR were implemented, although not as great as the impact on indemnity. We have included a projection of the impact on ALAE on this exhibit based on an estimated relationship between indemnity and ALAE discussed subsequently in this report.

Defense attorneys incur additional time and the expense of expert witnesses to analyze medical costs under the CSR. While the impact on ALAE would be much less per claim than the impact on indemnity, the impact on ALAE would be present across most claims (any claim for which related medical costs are

[25] This is an evolving issue related to the obligation of individuals to have insurance per the Affordable Care Act.

covered by private health insurance), including the vast majority of claims that close without indemnity. Consequently, the impact on ALAE is much broader than the impact on indemnity, which would decrease only for those claims that close with indemnity payment. We discuss the relationship between indemnity and defense costs in Section 9.1.

Indicated Indemnity and Defense Cost Severity Under the CSR

We rely on our projections discussed above to estimate the severities per claim in Exhibit A6, A7, and A8. These severities are based on the current Maryland closed claim data summarized within Exhibit D1 through D7. We estimate each of the following:

- Indemnity severity per closed with indemnity (CWI) event
- ALAE severity per CWI event
- ALAE severity per closed with expense (CWE) event

Note that these selections were made based on indemnity payments limited to $10 million per event due to data credibility.

These indications are derived using the Maryland data on a closed year basis. Thus, our selections serve as estimates for the average severities in Maryland under current tort law. In addition, as noted above, in estimating ALAE severity, we have derived separate indications for both CWI and CWE events. We have observed that CWI events have higher ALAE, on average, than CWE events.

Note that in Exhibit D2 through D4, each of the closed year severities is adjusted for inflation to a common average claim closure date of July 1, 2020. Our severity selections at this common closure date were then trended (at rates derived in Exhibit D5 and D6) to an average expected claim closure date for claims reported in the year beginning January 1, 2022 (derived in Exhibit D7). We have relied on the Maryland closed claim data in projecting that indemnity severity (limited to $10 million per event and subject to the current cap on non-economic damages as well as the CSR) will increase at 5.0% per annum and ALAE severity will increase at 5.0% per annum (although we have applied these trends rates elsewhere within our analysis as warranted).

Furthermore, as the data used is arranged on a closed year basis, Exhibit D7 calculates the trend-to dates assuming an effective date of January 1, 2022, that policies will be written uniformly over the year, and a selected lag of 2.15 years and 2.55 years between claim report and claim close date for CWE and CWI events, respectively, based on the Maryland closed claim data. Note that as of the date of this report, it is unclear how tort reform may be phased in if passed by legislature. For example, any potential new tort law could apply based on event date, report date, or closed date. Our analysis has assumed that any events reported after the effective date (assumed to be January 1, 2022 for our purposes) would be subject to the MICRA provisions.

The severities selected under current Maryland tort law are adjusted to reflect estimated severities if the exception to the CSR were implemented. The table below shows the projected severities both before and after adjustments for the exception to the collateral source rule:

Table 8. Projected Severity per Event under the Exception to the Collateral Source Rule

Cost Type	Projected Severity Prior to Exception to the Collateral Source Rule	Projected Severity Adjusted for the Exception to the Collateral Source Rule
Indemnity per CWI	$1,050,000	$ 975,000
ALAE per CWE	$72,500	$69,500
ALAE per CWI	$169,500	$162,000

Prior to the Collateral Source Rule Source: Exhibit D2, D3 and D4
Adjusted for Exception to the Collateral Source Rule Source: Exhibit A6, A7 and A8

4.3.2 Impact of the Cap on Damages

Maryland's cap on non-economic damages has been in place throughout the available history of the HSCRC Survey. Additionally, it is often difficult to obtain historical loss data that is segmented by economic and non-economic components. Consequently, we believe the best approach to estimating the impact of decreasing the cap on damages is by use of a size of loss model and Monte Carlo simulation intended to replicate MPL events as they would be distributed if the cap on damages were decreased.[26] In developing this model, we have relied on survey data received from Maryland hospitals supplemented with information from other resources where the requisite data from the hospitals was unavailable.[27]

The model indicates that, on average, indemnity and defense cost severity would decrease by 13% per occurrence if the cap on non-economic damages were decreased, as shown in Table 9 and Exhibit B1:

Table 9. Severity per Occurrence under Current and MICRA Tort Environments

Category	Current Tort Environment	$250,000 Cap on Non-Economic Damages	Indicated Decrease
Indemnity per CWI Occurrence	$1,230,000	$1,063,900	14%
ALAE per CWI Occurrence	$161,000	$143,100	11%
ALAE per CWE Occurrence	$70,100	$62,300	11%
Indemnity & ALAE per Occurrence	**$863,000**	**$749,000**	**13%**

Source: Exhibit B1

The simulation model and supporting assumptions are discussed further in Section 9.

In addition to a decrease in indemnity and defense cost severity, we also believe that lowering the cap on damages would result in a decrease in the number of filed and indemnified claims. Support for this selection is provided in Section 9.3. The estimated frequency impact due to the decrease in the cap on damages is provided in the table below and in Exhibit C1.

[26] We discussed a similar model estimating the effect of the overturn of the cap on damages in Illinois in an article entitled "Illinois Tort Reform and the Cost of Medical Liability Claims" published in the July/August 2010 issue of *Contingencies*, the magazine of the American Academy of Actuaries.

[27] These are discussed in Section 2 Data Sources.

Table 10. Impact on Number of Indemnified Claims Due to Change in Cap on Non-Economic Damages

Selected Impact
5%

Source: Exhibit C1

4.3.3 Impact of Limits on Attorney Fees

As described previously, since attorney fees are a share of indemnity payments, we do not expect any impact on claim severity due to implementing the limits on attorney fees under MICRA. However, we do believe that the number of claims reported would be impacted if attorney fees were reduced from current levels in Maryland. With a lower possible fee available for attorneys, there may be less incentive to pursue a case. We have not estimated a separate provision for the impact that attorney fee limits would have on indemnity or expense claim frequency, instead this is built into the frequency impacts included above in Table 10. It should be noted that this percentage is based on professional judgment, as we know of no empirical data upon which to measure the impact of attorney fee limits on the number of cases filed.

5. Recommendations for Stabilizing the Hospital Liability Market in Maryland

We estimate that implementing the provisions of California's MICRA would significantly reduce overall MPL costs in Maryland. The impact of these tort reforms is broad and elements of them would touch on most MPL cases that currently go through the tort system. We estimate that an implementation of MICRA provisions would both reduce the size of losses and reduce the number of MPL claims in Maryland, primarily due to the exception to the CSR and the decrease in cap on non-economic damages. However, care would need to be exercised in drafting any such legislation as seemingly minor exceptions can have a material impact on the overall effectiveness of the legislation to reduce costs (see Section 6). In addition, various other states have experienced repeals, judicial or otherwise, of MPL tort reform provisions including damage caps (Exhibit C4).[28]

Birth injury funds have been discussed in recent Maryland legislative sessions, with hearings on bills similar to the Virginia/Florida model (2019 session SB 869, HB 1320) and the New York model (2020 session SB 879, HB 1563). While only targeting a small subset of MPL claims, the reduction in cost to the tort system can be significant due to the average size of birth injury claims (we estimate that permanent and significant birth injury claims represent only 3% of the overall loss or expense claims but account for 25% of claims exceeding $10 million loss payment). Targeted legislation for these claims would decrease the uncertainty of MPL risk, perhaps even more significantly than overall costs, by reducing the risk of receiving very large claims. These cases typically involve substantial amounts of future medical care, something that MICRA reforms would not significantly reduce. Similar to any potential tort reform legislation, care would need to be exercised in determining qualifying injuries for the fund, funding sources, and parameters of the benefits to claimants. The risk of these claims would be transferred to the fund and, given the potential for substantial future care, small variance in the number of qualifying injuries could result in large changes in the required funding. This risk would be greatest in the early years of the fund as there would not be any Maryland-specific data on past fund utilization to estimate the amount of funding required.

Given the uncertainty surrounding the application of tort reform legislation and how birth injury funds might affect the number of claimants, we would expect the insurance market to react cautiously until issues are resolved in the courts and/or there is sufficient Maryland experience demonstrating reduced costs. A variety of factors influence a given insurer's risk appetite and willingness to write coverage in a particular venue. As a result, direct cost reductions, increased availability of hospital excess insurance and/or reduced uncertainty of MPL risk on hospital financials may not be immediate and are not guaranteed if provisions of the MICRA tort reform were to be enacted or if a birth injury fund were created.

In conclusion, we estimate that enacting provisions of MICRA tort reform and/or a birth injury fund would reduce MPL costs in the long-term and stabilize the hospital medical professional liability market in Maryland. Due to its broader nature, the provisions of MICRA may potentially lead to a greater reduction of MPL costs than a birth injury fund. However, due to the longer-term nature of tort reform playing out in the courts, we expect a birth injury fund would recognize MPL cost savings sooner.

[28] According to one study by Nelson et al., "Typically, the state courts have relied on various provisions of their state constitutions in declaring these statutes unconstitutional, including guarantees of equal protection, due process, right to a jury trial, and access to courts (Gfell 2004; Nelson 1989). In some of these cases, the courts based their determination of unconstitutionality partly on the lack of sufficient proof that caps would reduce liability insurance premiums." Source: Nelson, L., Morrisey, M., Kilgore, M., (2007) "Damage Caps in Medical Malpractice Cases," *The Milbank Quarterly*, 85(2): 259-286, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2690332/

6. Discussion

6.1. Considerations When Changing Tort Law or Creating a New Fund

As is the case with many laws, the details in the language can be important in determining how successful the law is in realizing the outcome it hopes to achieve. We would like to add several considerations that should be made if action is taken on this idea.

6.1.1 Effective Date of Change

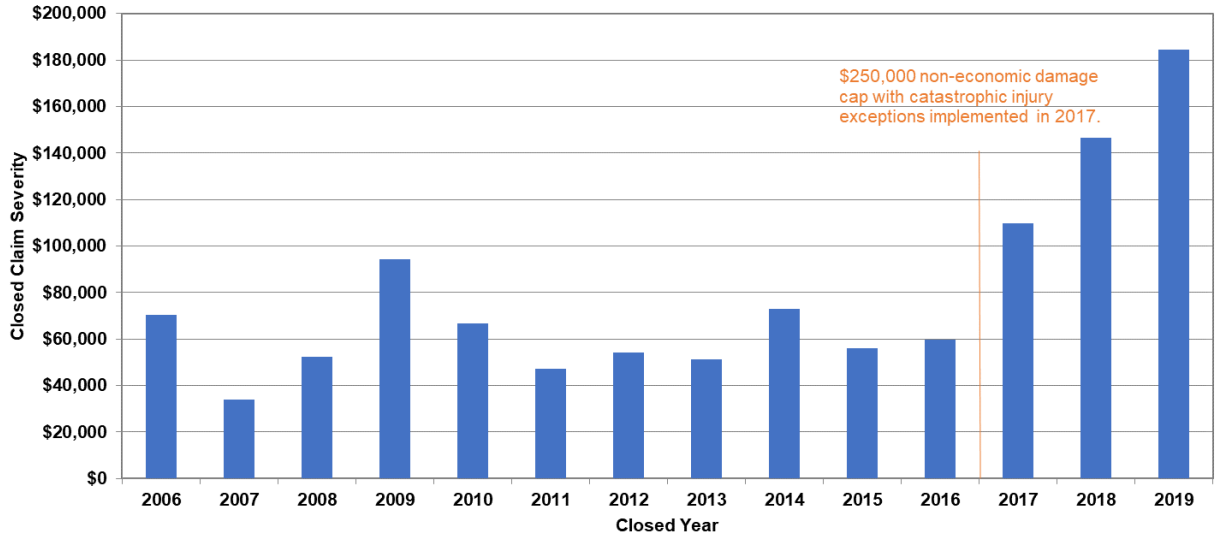
MPL cases typically have a long timeline from the date of the medical negligence (accident date) to the date reported to the hospital and/or insurance company (report date) to the resolution date of the claim (closed date). The date used as the reference for enacting new legislation can have material consequences on the actions of those involved in the market.

For example, if a new damage cap is implemented based on the underlying injury date, only events that occurred on or after the effective policy change date would be affected by the new cap. It may take several years for these cases to be resolved through the tort system and for the new damage cap to meaningfully affect MPL costs. If the new damage cap is implemented based on the claim report date instead, it would apply to all claims filed on or after the effective policy change date (even if the accident happened prior to the effective date). Thus, the report date approach may affect MPL costs sooner than the accident date approach. However, the report date approach may induce a flurry of claim activity before the policy change date. As an example, Texas instituted their damage cap in 2003 based on the claim report date. The reform was intended to reduce liability payments by instituting a $250,000 non-economic damage cap, so there was a concerted effort by attorneys and patients to file their claim before the new cap went into effect. This resulted in a flurry of claim activity before the cap was instituted. These claims that may have been filed in the months or years to follow were instead reported early, which resulted in a perceived decrease in reported claim activity following the implementation of the cap. On the other hand, Indiana has increased its cap several times in the past decade but on an accident date basis. Maryland's current annual non-economic damage cap increase is also based on the accident date. The accident date approach eliminates the incentive to file a claim earlier or later based on the policy change date.

6.1.2 Catastrophic Injury Exceptions ("Cap Busters")

Catastrophic injury exceptions to damage caps allow the jury to decide whether the cap is appropriate in a given case. Iowa's MPL tort law was modified in 2017 to incorporate a $250,000 non-economic damage cap with a catastrophic injury exception. The modification to its tort law states that the cap is used "unless the jury determines that there is a substantial or permanent loss or impairment of a bodily function, substantial disfigurement, or death, which warrants a finding that imposition of such a limitation would deprive the plaintiff of just compensation for the injuries sustained." This type of exception results in a "soft" cap in which the most severe cases are often uncapped. As shown in the figure below, data available from the Iowa Insurance Division's Medical Malpractice Annual Reports show a notable increase in severity following this law change. Iowa did introduce bills in 2020 to remove the "soft" cap language from the statute, but no votes have been taken to enact that legislation as of this writing.

Figure 12: Closed Claim Severity (Indemnity Only) from Iowa's Annual Medical Malpractice Reports



Source: Iowa Insurance Division Medical Malpractice Annual Reports

6.1.3 Birth Injury Fund Considerations

Care would need to be exercised in determining qualifying injuries for the fund, funding sources, and parameters of the benefits to claimants. The risk of these claims would be transferred to the fund and, given the potential for substantial future care, small variance in the number of qualifying injuries could result in large changes in the required funding. This risk would be greatest in the early years of the fund, with a lack of Maryland specific experience to rely on and a lack of built-up reserves.

Moreover, the implementation of a birth injury fund in Maryland could be affected by the State's unique all-payer rate-setting system and could influence performance under the TCOC Model. If Maryland were to create a birth injury fund through assessments/fees from physicians and hospitals (as is done in Florida and Virginia), hospitals could be assessed through the rate setting system. This would increase rates for all payers, including Medicare, thereby making it more difficult to achieve the annual savings requirements under the TCOC contract with the federal Centers for Medicare & Medicaid Services. Previous legislation introduced in Maryland contemplated this funding mechanism. As previously noted, the birth injury fund in New York is funded through the state budget. Use of general funds for a birth injury fund would not affect TCOC Model savings performance.

7. Qualifications

Stephen Koca is a Principal and consulting actuary with Milliman, Inc. He is a Fellow of the Casualty Actuarial Society and a Member of the American Academy of Actuaries (AAA) and has extensive experience performing actuarial analyses related to medical professional liability throughout the United States. Stephen meets the Qualification Standards of the AAA to provide the actuarial work included herein.

8. Uncertainty and Limitations

8.1. Data Reliance

In performing this analysis, we relied on data and other information provided by HSCRC, Maryland hospitals, various publicly available and purchased datasets as described herein, and internal Milliman benchmarking data on hospitals throughout the United States. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. In that event, the results of our analysis may not be suitable for the intended purpose.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. We believe the data provided via the Maryland Hospital Survey consisted only of Maryland claims data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Given additional time our survey may have included additional questions and/or requested additional detail on the existing questions. For example, the survey may have requested information not typically included on a loss run regarding apportioning out loss payments to its component parts (e.g., medical, lost wages, non-economic, etc.). We deemed that there was insufficient time for the hospitals to respond to these more in-depth requests.

8.2. Distribution

This report has been prepared for the Maryland HSCRC in response to the Task Order HSCRC-TO-2020-20-0263. We recommend that any third-party recipient have its own actuary or other qualified professional review the work product to ensure that the party understands the assumptions and uncertainties inherent in the estimates.

8.3. Variability of Results

We based our results on generally accepted actuarial procedures and our professional judgment. Our results reflect assumptions regarding issues such as trend, average loss and ALAE severity, distribution of claim type (e.g. CWI versus CWE, economic indemnity versus non-economic indemnity versus both), relationship between loss and ALAE, relationship between economic and non-economic indemnity, and fitted loss distributions. However, due to the uncertainty associated with the estimation of future loss payments and the inherent limitations of the data, actual results will vary from our projections. Reasons for this uncertainty include statistical fluctuations as well as unanticipated changes in claim procedures and settlement practices, legislative and judicial decisions, attitudes of claimants and the courts, current and perceived social and economic inflation, and numerous other social, political, and economic factors.

Our estimates make no provision for extraordinary future emergence of new classes of losses or types of losses not sufficiently represented in the Maryland Hospital Survey databases or that are not yet quantifiable, including the potential impact of the COVID-19 pandemic.

There is substantial uncertainty regarding the impact of COVID-19 on the level and nature of business activity. Exposures, claim frequency, and claim severity have been affected in ways we cannot currently estimate. It is important to recognize that actual losses may emerge significantly higher or lower than the estimates in this analysis.

The estimates discussed in this report reflect our professional judgment. However, given the factors discussed above, substantial variance of actual results from our projections is not unexpected.

8.4. Intended Measure and Range of Values

Our results should be considered point estimates within a wide range of possible outcomes. The intended measure of our point estimates for future costs is the mean. Where our results are presented in ranges, it is possible that actual results will fall outside of these ranges.

8.5. Sensitivity Analysis

The impact of the key variables in the analysis was considered. Reasonable alternative trend factor, severity, or correlation assumptions could change the results of this analysis materially, resulting in either greater or lesser impact estimates depending on how the variable is changed. Additionally, the inclusion or exclusion of individual Maryland Hospital Survey responses in the analysis could result in a greater or lesser impact estimate.

8.6. External Data

We supplemented our analysis with industry data, including data outside of Maryland, where necessary. The use of external data is another source of uncertainty in our estimates.

9. Technical Appendix

9.1. Relationship between Defense Costs and Indemnity

Exhibit E1 through E7 show the relationship between indemnity and ALAE based on the Maryland closed claim data. In general, we have observed that events with greater indemnity payments tend to have greater ALAE. Exhibit E1 provides various indications of the relationship between indemnity and ALAE. These indications vary by time period within the Maryland closed claim data as well as unlimited indemnity payments and indemnity payments limited to $10M. We tested both linear and log-linear[29] relationships between indemnity and ALAE. Based on the results of our analysis, we selected a log-linear relationship with a slope of 0.60. In other words, we have assumed that ALAE increases less than one dollar for each dollar increase in indemnity, and that the rate of increase in ALAE declines as indemnity increases.

The relationship between indemnity and ALAE on indemnified events is as follows[30]:

Ln (ALAE) = Ln (Indemnity) × 0.60 + Constant

This is mathematically equivalent to[31]:

ALAE = exp [Ln (Indemnity) × 0.60 + Constant]

The constant is calculated so that the average ALAE that results from the model is equal to the indication discussed above.

We rely on an analogous equation to the above for ALAE on CWE events. However, for these events, we model a theoretical indemnity intended to estimate the payment that would have resulted if the claim had closed with indemnity payment. This theoretical indemnity is based on the same parameters as the CWI events themselves. Hence to project the ALAE on CWE events we rely on the same selected slope of 0.60 but apply it to the natural logarithm of the theoretical indemnity. The constant differs in the equation so that the overall average ALAE on CWE events is equal to the amount estimated for these events.

9.2. The Simulation Model and Assumptions

As mentioned previously, we created a simulation model incorporating each of the assumptions discussed further below. The model simulated 1,000,000 occurrences of medical professional liability with the intended purpose of estimating the impact of decreasing the cap on non-economic damages for Maryland MPL claims. For each claim, the model simulated whether the claim was closed with indemnity or with expense as well as whether the claim was a wrongful death claim. If the claim was simulated to close with indemnity, the model in turn simulated whether it had only economic damages, non-economic damages, or both types of indemnity. Given this information, the model simulated the economic and non-economic indemnity.

For each simulated occurrence, the non-economic indemnity was capped at $250,000 for the MICRA scenario and compared to the current tort environment scenario to calculate the effect of the cap on the given occurrence. Exhibit D7 calculates an average accident date of 5/1/2021 based on our assumed effective date of rates of 1/1/2022 and average report date of 1/1/2023. Since the current cap on non-

[29] A log-linear relationship between indemnity and ALAE means that there is a linear relationship between Ln(indemnity) and Ln(ALAE), where "Ln" is the natural logarithm.

[30] Here, the mathematical expression "Ln" refers to the natural logarithm function.

[31] The mathematical expression "exp" refers to taking the exponent of the expression within the following braces, in which the base of the exponent is the natural number "*e*."

economic damages is applied based on accident year, we have used the 2021 cap values of $845,000 for non-wrongful death claims and $1,056,250 for wrongful death claims. ALAE was projected based on the indemnity amounts stemming from both the current and MICRA environments, according to the formula discussed above. The mean indemnity and ALAE per occurrence were calculated from the 1,000,000 simulated values, as shown in Exhibit B1.

Exhibit B2 lists the parameters used in the model, each of which is discussed further below.

Claims per Occurrence

An occurrence of alleged medical professional liability can result in multiple claims. It is necessary to distinguish between claims and occurrences in our analysis as the statutory cap on damages applies per occurrence. As a part of the data request to the Maryland hospitals, we requested an identifier to group claims to a common occurrence. For most responses, this field was not populated, and we therefore believe that most responses were already aggregated by occurrence or event. We performed a high-level review to identify multiple claims with similar accident dates, injury types, or closed dates which may indicate a common occurrence. This review solidified our belief that the responses absent event identifiers were provided on an occurrence basis. For responses that did have identifiers for a common event, we combined the claims to maintain consistency with the other occurrence data. Our simulation has been performed on a per event basis.

Portion of Wrongful Death Claims

Maryland's current tort environment has two caps—one for wrongful death claims with two or more beneficiaries, and one cap for all other claims. In order to appropriately capture the different caps, we selected a percentage of claims representing claims that include wrongful death. This selection was based on historical Maryland closed claim data by flagging injury type for key words such as death, demise, fatal, and suicide. Note that we did not have data available to identify the number of beneficiaries for wrongful death claims. However, we do believe that our selection of 18% is possibly lower than the actual rate due to lack of populated injury fields from some survey responders, or possible mislabeling or misspellings of the populated fields. Therefore, we believe our selection reasonably captures the correct group of claims. Our selection is shown in Exhibit D8.

Claim Disposition Ratios

Within the simulation model we must distinguish between CWI and CWE events. Thus, we must estimate the portion of events that fall within each of these categories. The indications for these percentages and our selections are shown in Exhibit D1 and are again based on the Maryland closed claim data.

Table 11. Claim Disposition Ratios based on Maryland Closed Claim Data

Closed Years	Portion CWI	Portion CWE
2010-2020	60%	40%
2015-2020	60%	40%
2018-2020	63%	37%
2010-2019	59%	41%
Model Assumption	**60%**	**40%**

Source: Exhibit D1

Probabilities of Indemnity Types on CWI Events

We have observed that economic and non-economic losses are not present in every claim payment (as evidenced by the Texas dataset, as this level of detail was not available from the Maryland data). Therefore, we relied on the Texas data to estimate the probability of economic loss only, non-economic loss only, or both indemnity types occurring. The results of this analysis are detailed in Table 12 and Exhibit G2.

Table 12. Probability of Indemnity Type on CWI Events Based on Texas Department of Insurance Data

Indemnity Type	Probability
Economic Damages Only	3%
Non-Economic Damages Only	19%
Both Economic and Non-Economic Damages	78%

Source: Exhibit G2

Indemnity and Defense Cost Severity

Our starting point for indemnity and ALAE severities is based on the work done in the prior section of the report for the implementation of the exception to the CSR. The severities incorporated into our model are those derived in this section under the CSR:

Table 13. Projected Severity per Event under the Exception to the Collateral Source Rule

Cost Type	Severity
Indemnity per CWI	$975,000
ALAE per CWE	$69,500
ALAE per CWI	$162,000

Source: Exhibit A6, A7 and A8

Economic and Non-Economic Loss Severities

Our model separately projects economic and non-economic loss as the cap on damages applies only to the second of these. To do so, we selected a ratio between the economic and non-economic severities based on the Texas data, as shown in Exhibit G1. Note that we do not rely on the Texas severities themselves but rely on the ratio between them applied to Maryland experience. We have relied primarily on the older closed data that would have been weighted toward experience prior to when Texas's $250,000 cap on non-economic damages took effect. Hence, we believe the indicated ratios from the older closed years are more appropriate for use in apportioning Maryland severities under the current cap on damages.

Distribution of Indemnity per Claim

In addition to estimating the component portions of indemnity severity, it is also necessary to estimate how the individual indemnity payments will vary around the average indemnity severity. To do so, we have performed goodness of fit tests of various statistical distributions against each of the detailed claim datasets available. A goodness of fit test measures how well a given statistical distribution fits a given set of observations. Three of the most common goodness of fit tests (which we believe to be the most appropriate for these circumstances) are the Kolmogorov-Smirnov, Anderson-Darling, and Chi-Square tests. A brief description of each test follows:

- Kolmogorov-Smirnov[32]: measures the greatest difference at all points (i.e., values in the dataset) between the statistical distribution and the empirical distribution of the dataset.
- Anderson-Darling[33]: measures the difference at various segmented points between the statistical distribution and the empirical distribution of the dataset, then weights the squared differences based on the expected distribution.

[32] See http://en.wikipedia.org/wiki/Kolmogorov_Smirnov for additional information on the Kolmogorov-Smirnov test.

[33] See http://en.wikipedia.org/wiki/Anderson_Darling_test for additional information on the Anderson-Darling test.

- Chi-Square[34]: apportions the data points by size into various segments and measures the difference between the number of data points in each segment and the number expected in each segment based on the statistical distribution.

Exhibit E1 summarizes the results of the Kolmogorov-Smirnov, Anderson-Darling, and Chi-Square goodness of fit tests for the Maryland and Texas closed claim data. The Texas data has been tested on economic and non-economic losses separately, as we rely on these separate distributions in our analysis. Table 14 summarizes the results found in Exhibit E1.

Table 14. Summary of Best Fitting Distributions for Indemnity Payments per Event

Test	Best Fit
Texas - Economic	
Kolmogorov-Smirnov	Lognormal
Anderson-Darling	Lognormal
Chi-Square	Lognormal
Texas – Non-Economic	
Kolmogorov-Smirnov	Lognormal
Anderson-Darling	Lognormal
Chi-Square	Lognormal
Maryland	
Kolmogorov-Smirnov	Lognormal
Anderson-Darling	Lognormal
Chi-Square	Lognormal

Source: Exhibit E1

Note that a lower test statistic, as shown in this exhibit, indicates a better fit to the given statistical distribution. We considered a variety of common statistical distributions in performing these tests, not only those shown in the exhibits. The exhibits display only the best-fitting three of all statistical distributions considered.[35]

Based on the results of these tests, we believe that the lognormal distribution best represents the distribution of indemnity per event in total and in its components. The lognormal distribution is completely defined by two parameters:

- The mean of the distribution, which in our case is the expected indemnity per event (i.e., indemnity severity)
- The coefficient of variation[36] of the distribution, which determines how widely dispersed individual indemnity payments are around the mean. A higher coefficient of variation indicates a more dispersed distribution.

The means of the lognormal distributions for each indemnity type were discussed earlier within this section. The coefficients of variation for economic and non-economic loss were estimated based on the

[34] See http://en.wikipedia.org/wiki/Chi_Square_test for additional information on the Chi-Squared test.

[35] Distributions considered included the Lognormal, Gamma, Weibull, Exponential, Logistic, Student's *t*, Normal, Beta, and Pareto, among others.

[36] The reader may be more familiar with the concept of standard deviation. The coefficient of variation is equal to the standard deviation of the given distribution divided by its mean.

Texas data, as shown in Exhibit E2 and E4 for economic and non-economic indemnity, respectively. We use the coefficients of variation to model the distribution of losses prior to the cap on non-economic damages, but the total loss distribution is normalized to the selected Maryland-specific distribution.

Correlation between Economic and Non-Economic Indemnity Payments

We have observed that events with greater economic indemnity payments tend to have greater non-economic indemnity payments as well. Exhibit G3 provides various indications of this relationship using various time periods within the Texas data. We tested both linear and log-linear relationships between the economic and non-economic indemnity. Based on these indications, we selected a log-linear relationship with a correlation of 0.60.

9.3. Impact on Claim Frequency

As previously mentioned, we have also estimated the impact to claim frequency if MICRA were to be implemented.

Impact due to Cap on Non-Economic Damages

In the current Maryland MPL tort environment, there may be an incentive for a patient and their attorney to file suit on a claim with a low likelihood of success but with significant potential damages. A decreased cap on non-economic damages would reduce this incentive to file such a claim. Table 15 below illustrates this change in incentive with two hypothetical example situations.

Table 15. Effect of Caps on Damages on the Decision to Litigate

Claim	Economic Damages	Non-Economic Damages	Cap on Non-Economic Damages	Probability of Plaintiff Verdict	Expected Gross Indemnity*	Expected Net Financial Value**
A	$1,000,000	$1,000,000	$845,000	20%	$369,000	$17,250
A	$1,000,000	$1,000,000	$250,000	20%	$250,000	($12,500)
B	$1,000,000	$1,000,000	$845,000	80%	$1,476,000	$1,124,250
B	$1,000,000	$1,000,000	$250,000	80%	$1,000,000	$737,500

Source: Hypothetical example

* Calculated as the product of the capped damages and the probability of a plaintiff verdict.

** Calculated as the expected gross indemnity less fixed litigation costs of $75,000 and variable litigation costs of 15% of the capped damages.

In the above example, Claims A and B each have the same potential damages and differ only in the probability of a plaintiff verdict. Claim B is more meritorious, with a likelihood of a plaintiff's verdict of 80%. Using either cap on non-economic damages, a financial incentive exists for the plaintiff to file Claim B.

In contrast, Claim A is less likely to succeed, with a 20% probability of a plaintiff's verdict. With the higher cap on non-economic damages, financial incentive nonetheless exists to file Claim A due to the size of the potential recovery. With a smaller cap on non-economic damages in place, the low probability of recovery combined with the cost of litigation reduces the incentive to file the less meritorious claim. Although the above example is a simplification of the complex realities of MPL cases, it is illustrative of how caps on non-economic damages can impact claim frequency. A change in claim frequency following a change to a statutory damage cap has been seen in other states. An increase in claim frequency when a cap on damages has been overturned and decreases in claim frequency in states that have enacted caps on damages both demonstrate the effect on frequency that a cap can have. Based on the experience of six states, we have estimated the empirical impact and selected the projected effect on claim frequency in Maryland. Note the states examined in this analysis previously had no cap on non-economic damages, and then implemented a cap. Since Maryland currently has a cap in place and the cap will be lowered, we

have decreased the indicated impact in our selected values (e.g., the existing cap on damages may already be impacting claim frequency).

Additionally, Maryland claims tend to close with an indemnity payment more often than the countrywide average. This may imply that the current claims in Maryland tend to be more meritorious, and therefore, there would not be as large of a decrease in frequency in comparison to states with a lower ratio of claims with indemnity.

Table 16. Impact on Frequency due to Change in Cap on Non-Economic Damages and Limits to Attorney Fees

State Group[37]	Empirical Impact*	Selected Impact in Maryland
Tort Reform	20%	**5.0%**

Source: Exhibit C1 and Exhibit C2

* Based on a weighted average of all six states. Additional indications shown in Exhibit C2.

Exhibit C2 estimates the empirical impact in six states identified as "tort reform" states of the decrease in claim frequency after the enactment of a cap on damages. The states selected for review had caps implemented from 2002 through 2005, and previously had no cap in effect. These states also had sufficient data to observe the trend in claim frequency following the implementation of the cap. Further, since the previous environments were unlimited (i.e., no caps) in these states, the full effect of cap implementation can be observed. For each state, a frequency relativity in comparison to countrywide (excluding states impacted by tort reform) is shown. These frequency relativities are normalized to the year in which the cap was enacted for each state so that the change in frequency in each state since the overturn of the cap on damages can be compared against the experience of other states not materially impacted by the enactment of tort reform during the corresponding time period. The frequencies underlying Exhibit C2 are shown in Exhibit C3.[38]

Note that in some cases, there is a slight increase in claim frequency relative to the countrywide frequency for the first few years following the enactment of the cap. We believe this occurs because the claim data aggregated by the NPDB is collected on a closed year basis. Consequently, there is a lag between a decrease in claims reported due to the overturn and their subsequent closing.

Exhibit C4 through C8 provide additional information regarding the impact to frequency, severity, and pure premium after a change to a cap on damages. Exhibit C4 provides an overview of current and past caps by state. Exhibit C5 through C7 graphically depict the change in pure premium, severity and frequency from 2001 through 2012. We chose this window as the six states we reference implemented their caps between 2002 and 2005. The goal is to identify the change due to the tort reform in the years following, hence why we only review the impact through 2012. Additionally, some states have started to repeal caps (such as Florida in 2014), so we exclude the most recent years of data to avoid the repeal having an impact on the results. Exhibit C8 shows the percent change by state, which supports the previous charts.

[37] Florida, Mississippi, Nevada, Oklahoma, South Carolina, and Texas (note that this list excludes such states as Illinois, in which tort reform was implemented for a relatively short period of time prior to being overturned).

[38] Calculated as the number of claims closed with indemnity from the NPDB public use data file divided by the number of active physicians from successive editions of the AAMC's *State Physician Workforce Data Report* or the AMA's *Physician Characteristics and Distribution in the US*.

10. List of Acronyms

AAA	American Academy of Actuaries
AAMC	Association of American Medical Colleges
AHA	American Hospital Association
ALAE	Allocated Loss Adjustment Expense
AMA	American Medical Association
CSR	Collateral Source Rule
CWE	Closed With Expense
CWI	Closed With Indemnity
ERISA	Employee Retirement Income Security Act
HSCRC	Health Services Cost Review Commission
MICRA	Medical Injury Compensation Reform Act
MPL	Medical Professional Liability
NAIC	National Association of Insurance Commissioners
NPDB	National Practitioner Data Bank
PCF	Patient's Compensation Fund
TCOC	Total Cost of Care

11. Glossary of Terms

Allocated loss adjustment expense	Insurance (or retained risk) expenses that are directly attributable to a specific claim, such as the legal costs to defend against the claim.
Birth injury fund	A state administered fund designed to cover costs related to infant neurological injuries, including lifetime care.
Captives	A popular risk retention mechanism in which a hospital creates an organization (captive), and the captive sells an insurance policy to the hospital covering its medical professional (and perhaps other) liabilities.
Claim frequency	Number of insurance (or retained risk) occurrences during a given time period.
Claim severity	Total payment per an insurance (or retained risk) occurrence. May be segmented into indemnity severity (total loss component of payment per occurrence) and ALAE severity (total expense component of payment per occurrence).
Closed with expense	Insurance (or retained risk) claims that close with ALAE payments, but no associated indemnity/loss payments.
Closed with indemnity	Insurance (or retained risk) claims that close with indemnity/loss payments.
Collateral source rule	A legal rule that prevents damages from being reduced by amounts already recovered from a third party.
Correlation	Measure of the relationship between two or more variables, indicating the dependence of one variable outcome on another variable outcome.
Economic damages	Damages awarded to compensate an injured party for the financial impact of the injury, including lost wages and medical expenses.
Excess liability fund	A state administered fund financed by taxpayers that reinsures hospitals and other healthcare providers, and therefore makes payments to injured patients after the at-fault party has paid a state-defined amount.
Excess (of loss) insurance	Insurance that covers payments in excess of primary insurance or retained risk.
Excess risk	The potential liability above the amount covered by a retained risk mechanism or primary insurance policy.
Goodness of fit test	A statistical test measuring how well a dataset fits a certain distribution type, measuring the discrepancy between the actual data values and the expected data values under a given distribution.
Indemnity/loss payments	The total compensation paid to an injured party on behalf of the hospital (and/or other at-fault parties).
Loss costs	The monetary costs from a hospital's perspective on account of medical professional liability, equal to the total of indemnity/loss payments and allocated loss adjustment expenses.
Medical loss payments	Payments to an injured patient compensating them for medical costs as a result of their injury. When added with non-medical loss payments, they equal economic damages.

Medical professional liability	Also known as "medical malpractice", the liability resulting from alleged negligent care by a hospital or other healthcare provider.
Non-economic damages	Damages awarded to compensate an injured party for items such as pain and suffering or loss of consortium.
Non-medical loss payments	Payments to an injured patient compensating them for non-medical costs (i.e., lost wages) as a result of their injury. When added with medical loss payments, they equal economic damages.
Occurrence	A single event relating to alleged medical professional liability. Multiple claims may arise from a single occurrence.
Patient's compensation fund	A state administered fund financed by assessments on MPL market participants that reinsures hospitals and other healthcare providers, and therefore makes payments to injured patients after the at-fault party has paid a state-defined amount.
Pure premium	A unit of measurement to normalize the amount of losses per an underlying measure of exposure (e.g., loss per physician).
Retained risk	Potential liability kept by a hospital before commercial insurance pays (similar to a deductible for personal insurance).
Risk retention group	A risk retention vehicle that acts as an insurance company but is owned by the member organizations receiving insurance.
Tort law	Laws related to civil cases, and more specifically in this report, laws related to medical professional liability.
Trusts	A risk retention vehicle in which funds are deposited by a hospital with the purpose of paying future liabilities.
Wrongful Death Claim	A medical professional liability claim alleging liability for an event resulting in death.

12. Maryland Hospital Survey Instrument

Information Request on Professional Liability Programs

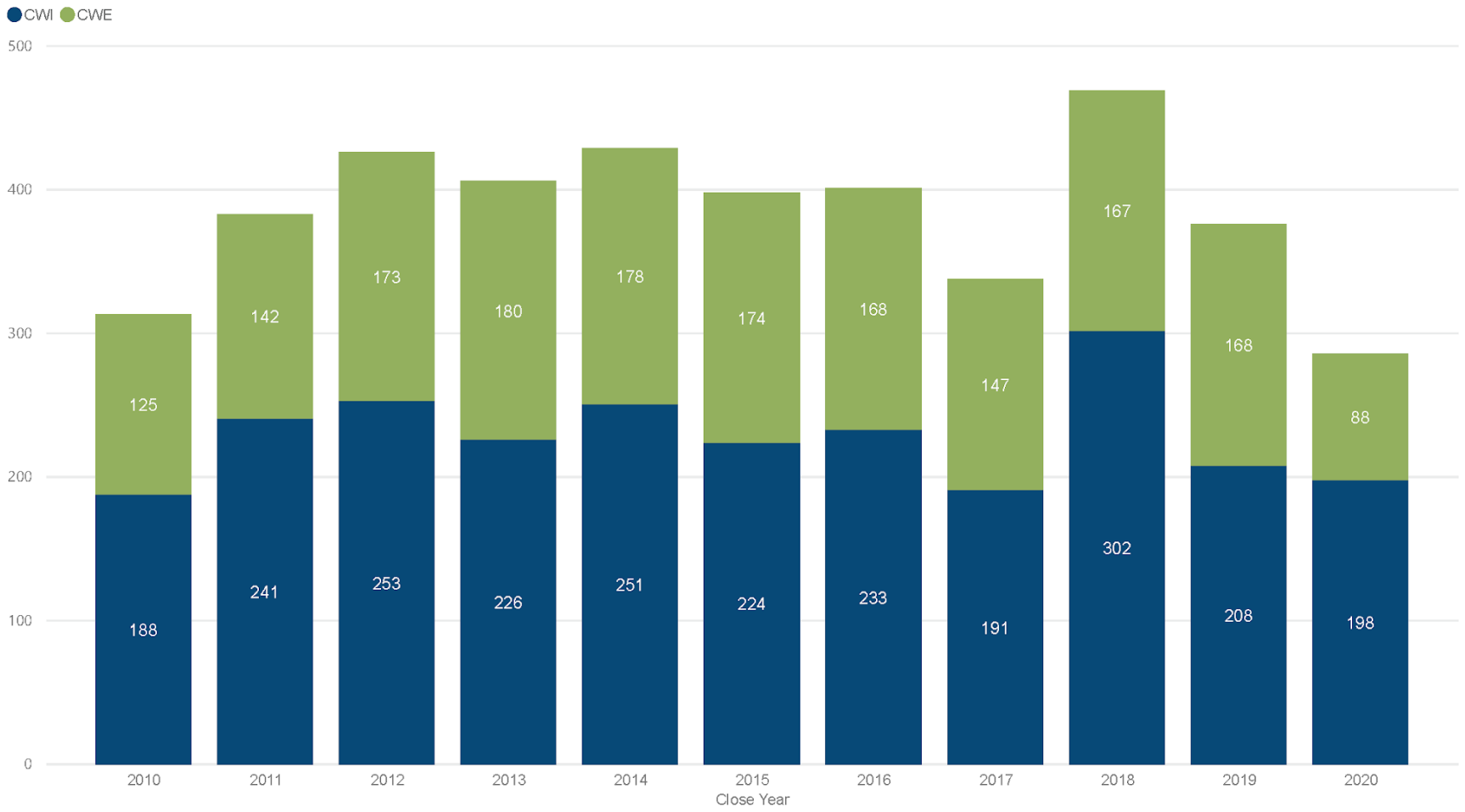
- **Retained Risk Mechanism.** What vehicle do you use to fund the retained risk portion of your medical professional liability program (e.g., Trust; captive; risk retention group)? Please note any changes going back to 2010, and any relevant discussion on impetus for changes.
- **Physician Risk.** If physicians are included in your retained risk program, please provide number of physician full-time equivalent (FTE) each year 2010 to current.
- **Excess Insurance Tower.** Provide detail on your medical professional liability insurance tower for each renewal (2010 and subsequent). Include such detail as insurance attachment, limit of liability, insurer, and premium by layer.
- **Coverage Exclusions**. Provide changes in excess coverage exclusions and/or terms and conditions that have restricted insurance coverage since 2015.
- **All Other.** Provide any other information or data that you believe may be relevant to our review of the hospital medical professional liability climate in Maryland.
- **Historical Claim data**. Provide detailed information for professional liability claims closed in calendar year 2010 and subsequent. Detail should include:
  - Claim Number;
  - Companion master claim number, or other means of identifying claims related to the same underlying event;
  - Date of event, claim report, and claim closure;
  - Paid amounts for loss, including retained and insured amounts;
    - If available, separately note amounts contributed from other defendants (e.g., independently insured physicians)
    - If available, separately note an estimated split of economic damages versus non-economic damages for claims in excess of $1 million
  - Paid amounts for loss adjusting expenses, including retained and insured amounts;
  - Location and/or Facility;
  - Claim type identifier (e.g., indicator if the claim results from a Medical Board action or is otherwise non-standard);
  - Claim injury group (e.g., death, major permanent, etc.);
  - Hospital department responsible (e.g., Emergency, Labor and Delivery, Operating Room, etc.)

PLEASE DO NOT SEND ANY IDENTIFIABLE PATIENT INFORMATION! This includes individual names, addresses, or any other data items considered identifiers or Protected Health Information (PHI) under HIPAA. All responses are confidential. Only aggregate data will be included in public-facing reports. While Excel is preferred, please provide information in whatever format available. For your convenience a suggested template is provided in the next worksheets. Please direct any questions to HSCRC.Liability.Survey@milliman.com.

	Information Needed	Response
1	**Name of the health system or hospital(s) included in this response.**	
2	**Retained Risk Mechanism.** What vehicle do you use to fund the retained risk portion of your medical professional liability program (e.g., Trust; captive; risk retention group)? Please note any changes going back to 2010, and any relevant discussion on impetus for changes.	
3	**Physician Risk.** If physicians are included in your retained risk program, please provide number of physician full-time equivalent (FTE) each year 2010 to current.	
4	**Excess Insurance Tower.** Provide detail on your medical professional liability insurance tower for each renewal (2010 and subsequent). Include such detail as insurance attachment, limit of liability, insurer, and premium by layer.	*Provide as a separate attachment if necessary (e.g., screenshot of the tower).*
5	**Coverage Exclusions.** Provide changes in excess coverage exclusions and/or terms and conditions that have restricted insurance coverage since 2015.	
6	**All Other**. Provide any other information or data that you believe may be relevant to our review of the hospital medical professional liability climate in Maryland.	
7	**Historical Claim data.** Provide detailed information for professional liability claims closed in calendar year 2010 and subsequent.	*Please provide output from your claims system or respond directly in worksheet "Input Historical Claims" .*
8	**Best person(s) to contact for questions regarding the data submitted.**	*Please provide name(s) and email address(es).*

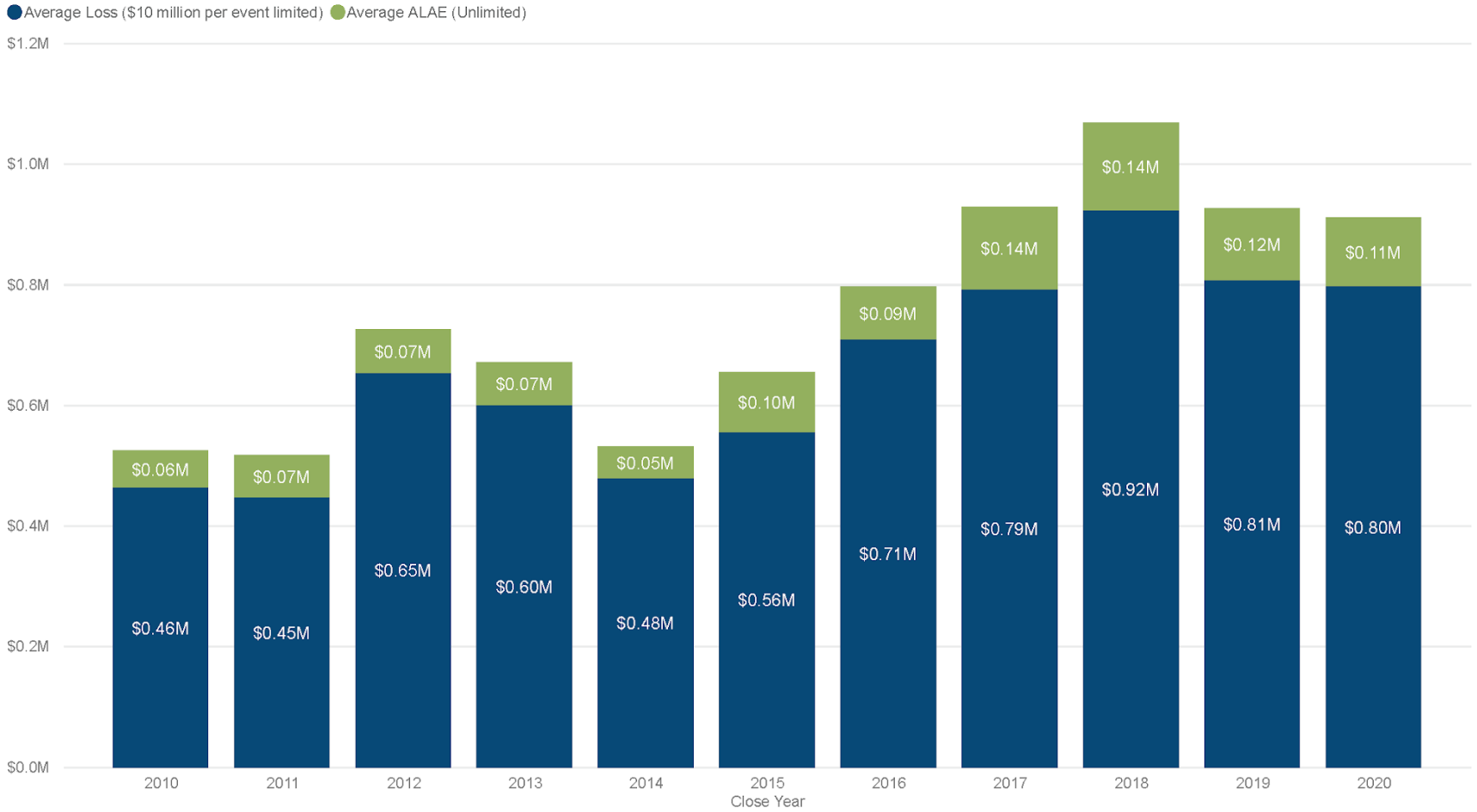
13. Technical Exhibits

Exhibit 1. Number of Claims by Close Year and Resolution



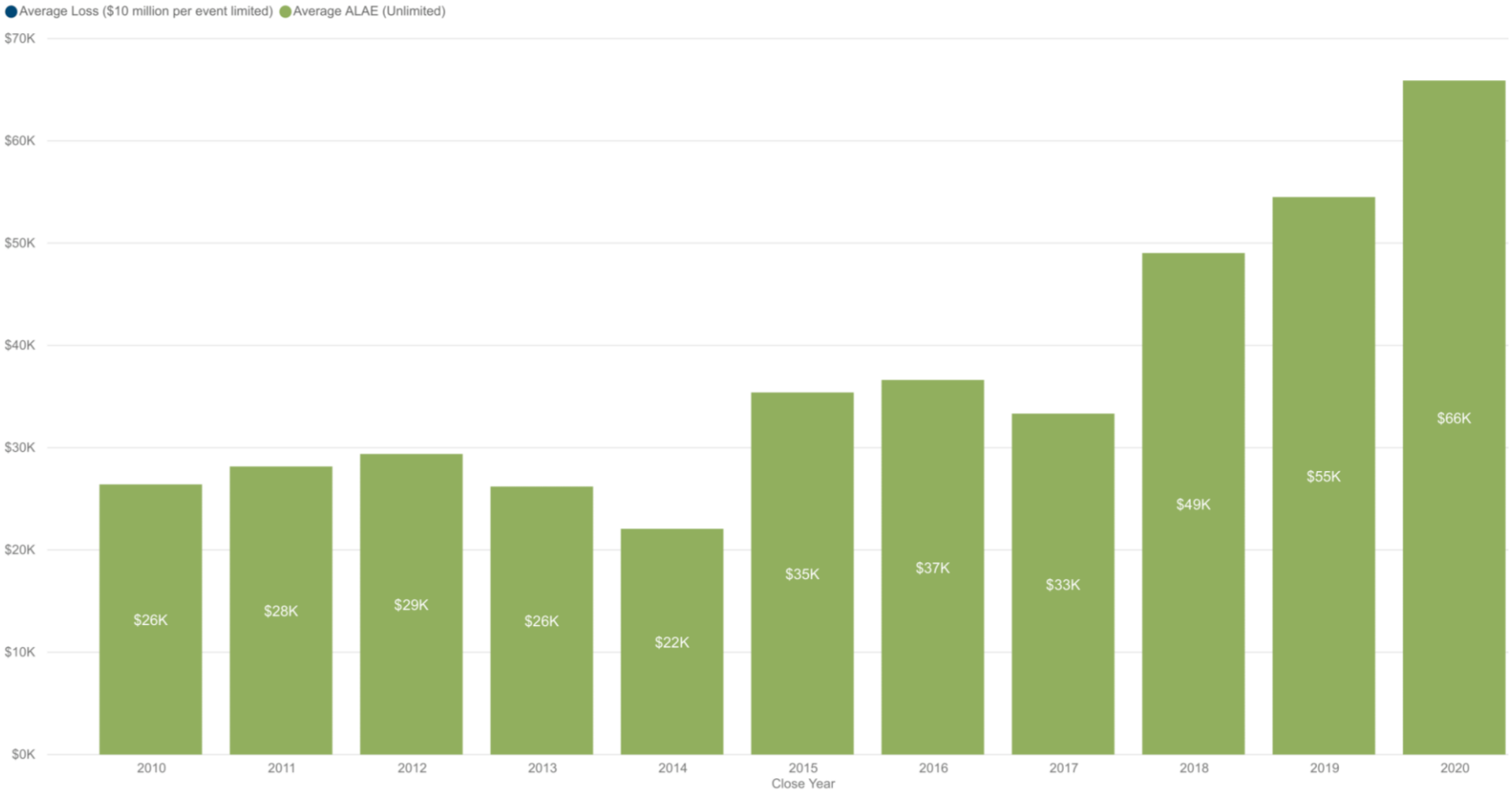
Data for the 2020 year is incomplete; estimated to represent 80% of the full year activity.

Exhibit 2. Average Severity by Close Year (Claims with Loss Payment)



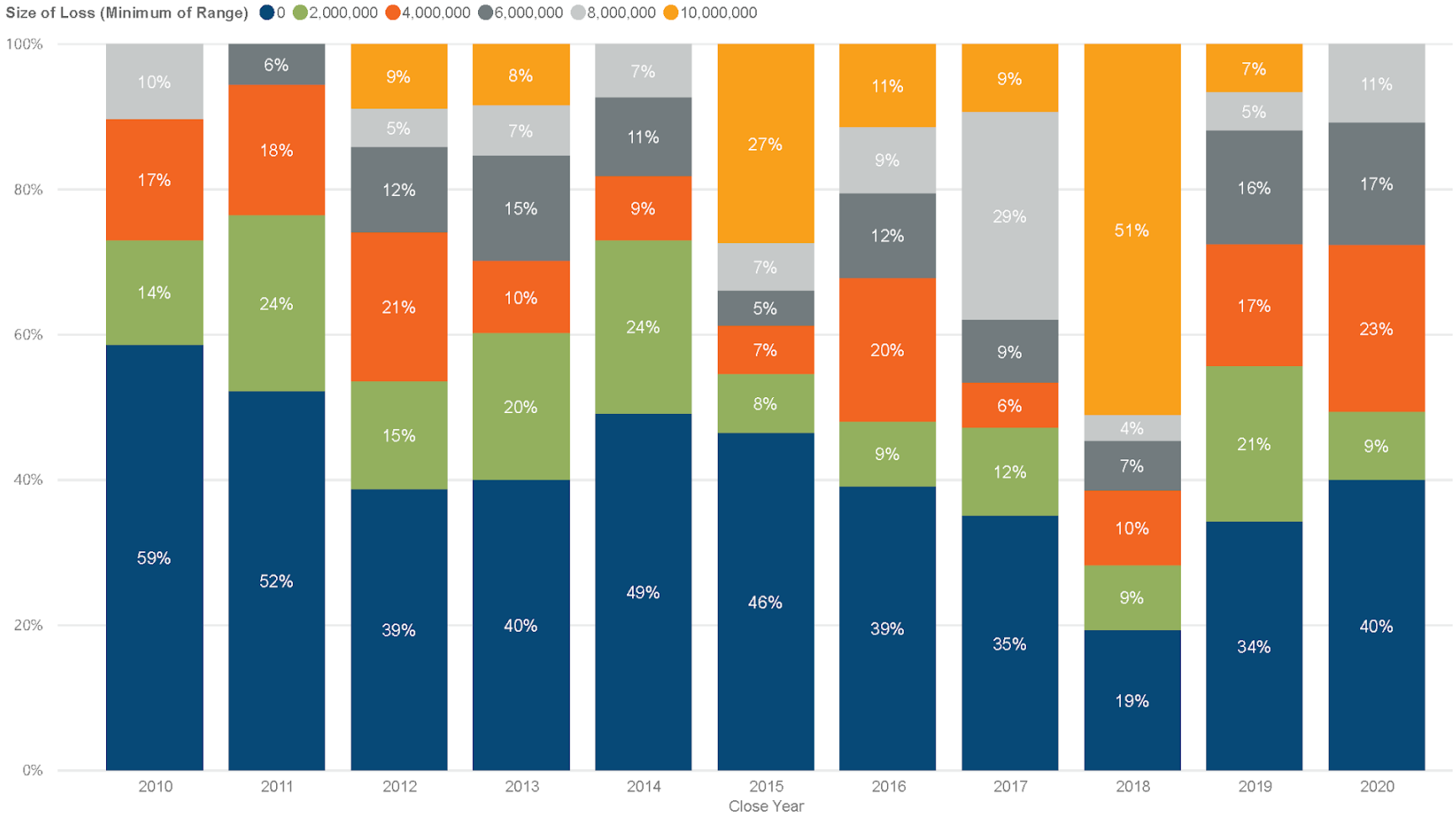
Data for the 2020 year is incomplete; estimated to represent 80% of the full year activity.
Loss and expense amounts not trended for purposes of this exhibit.

Exhibit 3. Average Severity by Close Year (Claims with Expense Only)



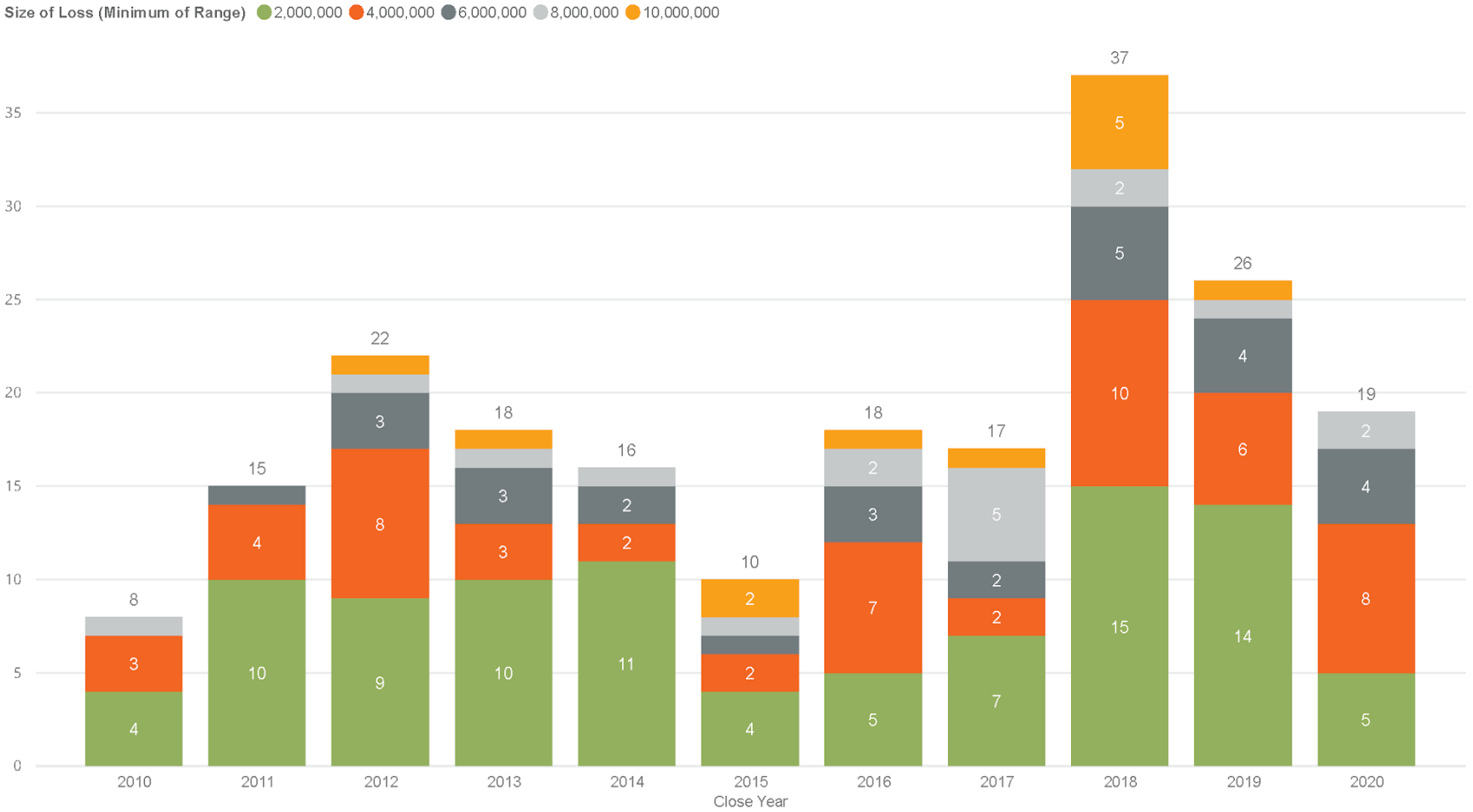
Data for the 2020 year is incomplete; estimated to represent 80% of the full year activity.
Loss and expense amounts not trended for purposes of this exhibit.
There is by definition zero loss on claims with expense only.

Exhibit 4. Distribution of Unlimited Loss by Close Year and Size of Loss (Loss only)



Data for the 2020 year is incomplete; estimated to represent 80% of the full year activity.
Loss and expense amounts not trended for purposes of this exhibit.

Exhibit 5. Number of Claims by Close Year and Size of Loss (Claims Greater Than or Equal to $2 Million; Loss only)



Data for the 2020 year is incomplete; estimated to represent 80% of the full year activity.
Loss and expense amounts not trended for purposes of this exhibit.

Exhibit 6. Distribution of Number of Claims by Hospital Department

Exhibit excludes claims where hospital department is other/unknown based on information provided in Maryland Hospital Survey (34% of claims).

Exhibit 7. Distribution of Loss (Unlimited Basis) by Hospital Department

Exhibit excludes losses where hospital department is other/unknown based on information provided in Maryland Hospital Survey (23% of unlimited losses).

Exhibit 8. Distribution of Loss (Limited to $10 Million per Event Basis) by Hospital Department

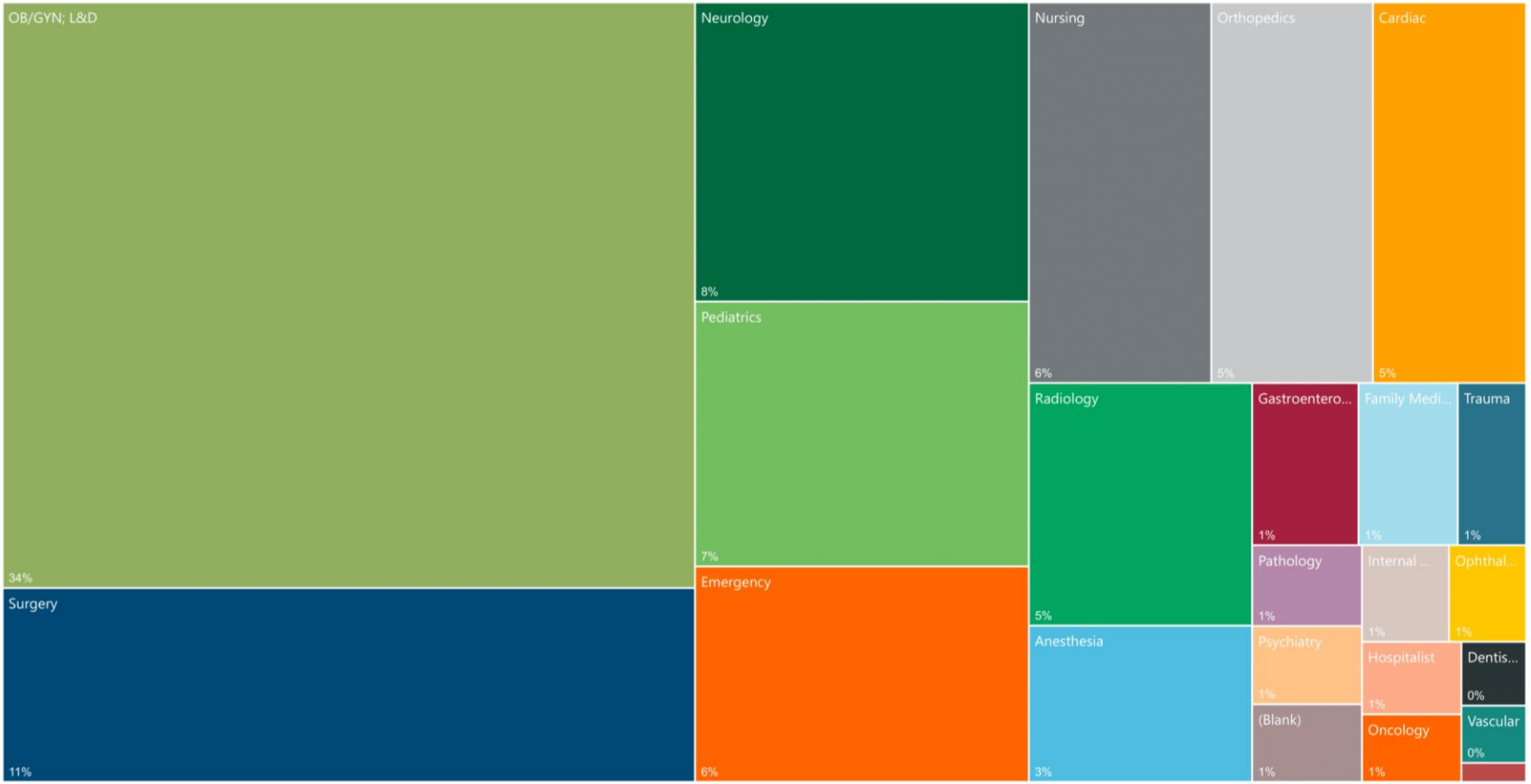
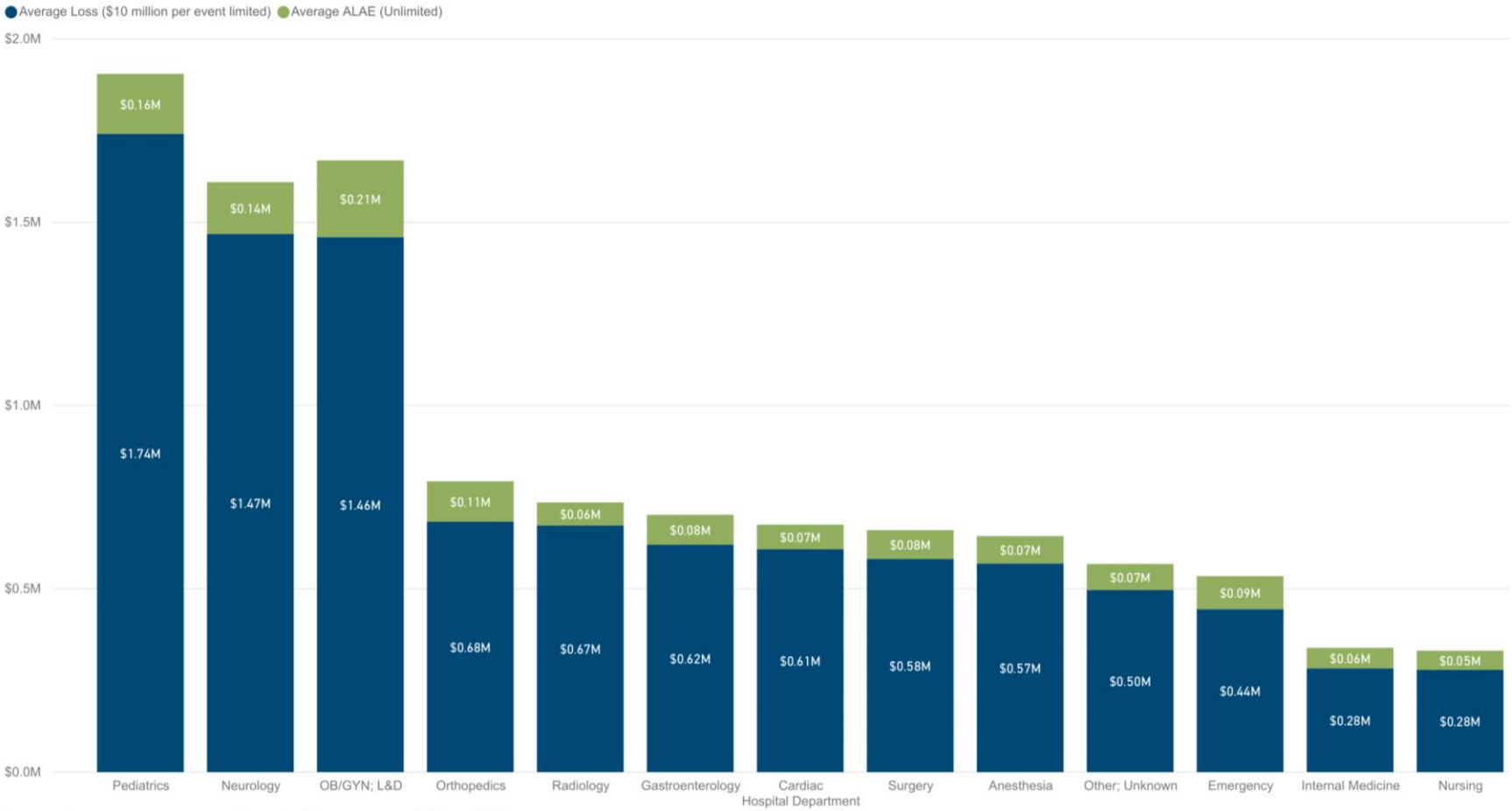


Exhibit excludes losses where hospital department is other/unknown based on information provided in Maryland Hospital Survey (26% of $10 million per event limited losses).

Exhibit 9. Average Severity (Claims with Loss Payment) by Hospital Department (Minimum 25 Claims)



Loss and expense amounts not trended for purposes of this exhibit.

Exhibit 10. Distribution of Claim Resolution by Hospital Department (Minimum 25 Claims)

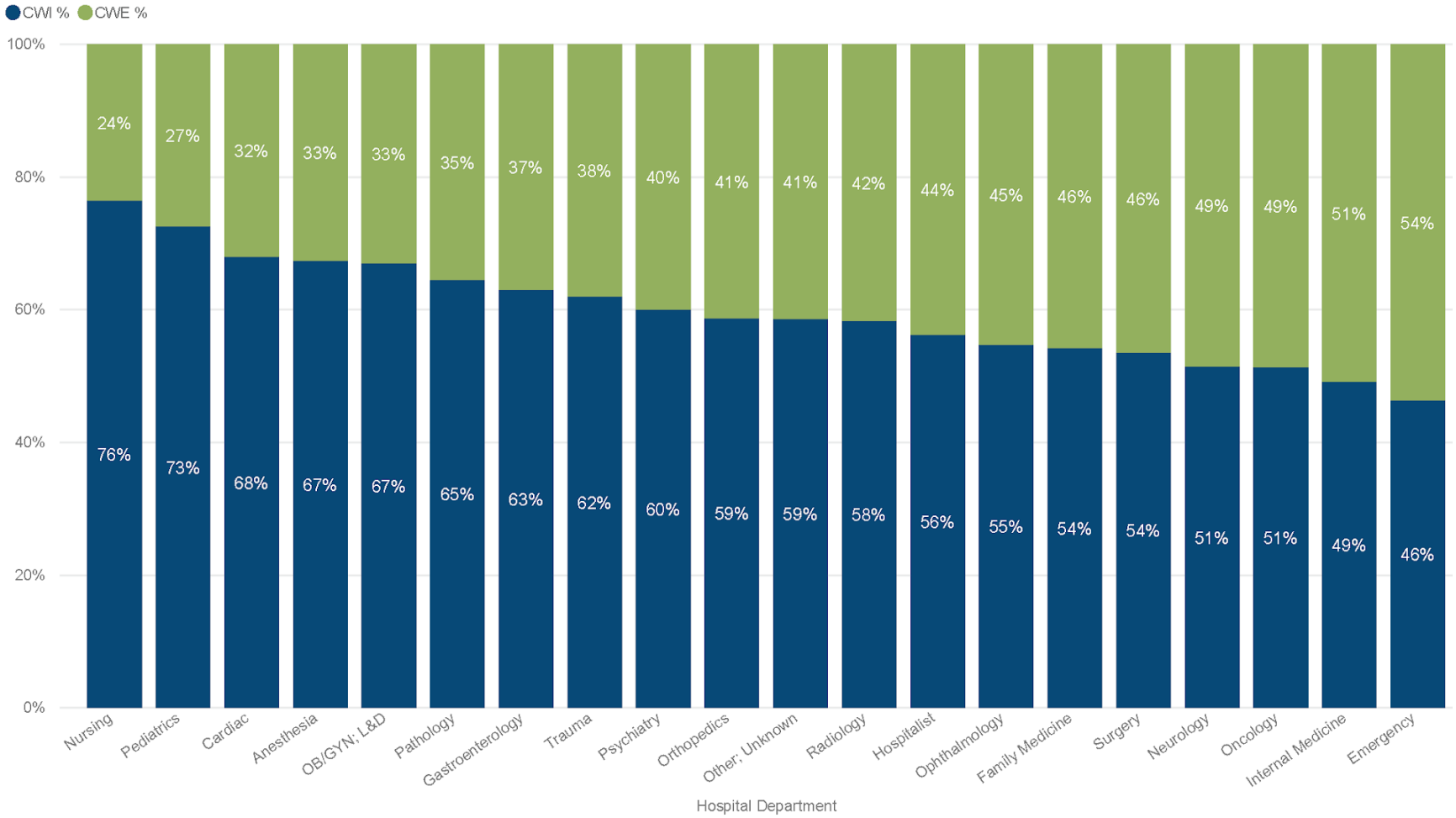


Exhibit 11. Distribution of Number of Claims by Type of Injury

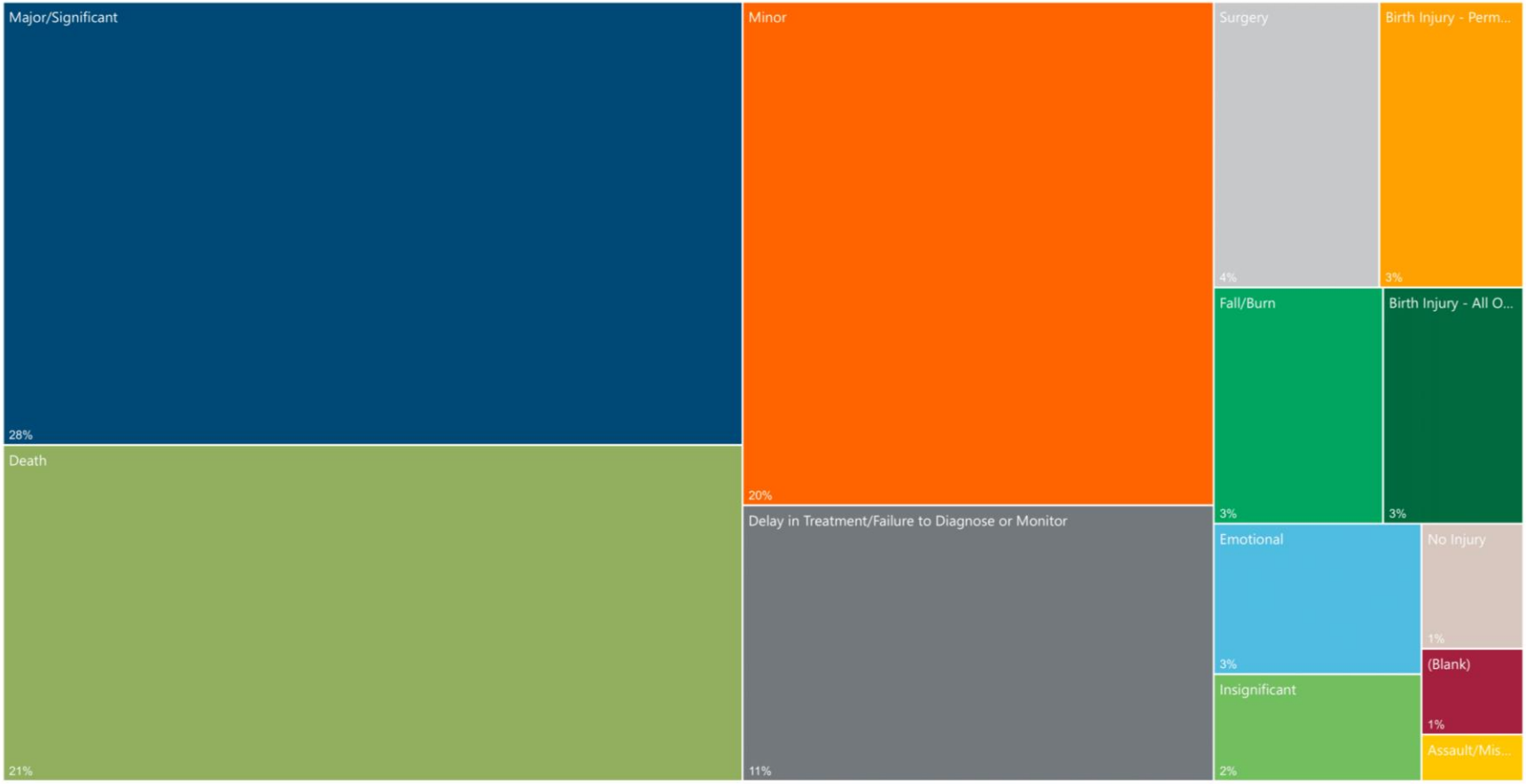


Exhibit excludes claims where type of injury is other/unknown based on information provided in Maryland Hospital Survey (23% of claims).

Exhibit 12. Distribution of Loss (Unlimited Basis) by Type of Injury

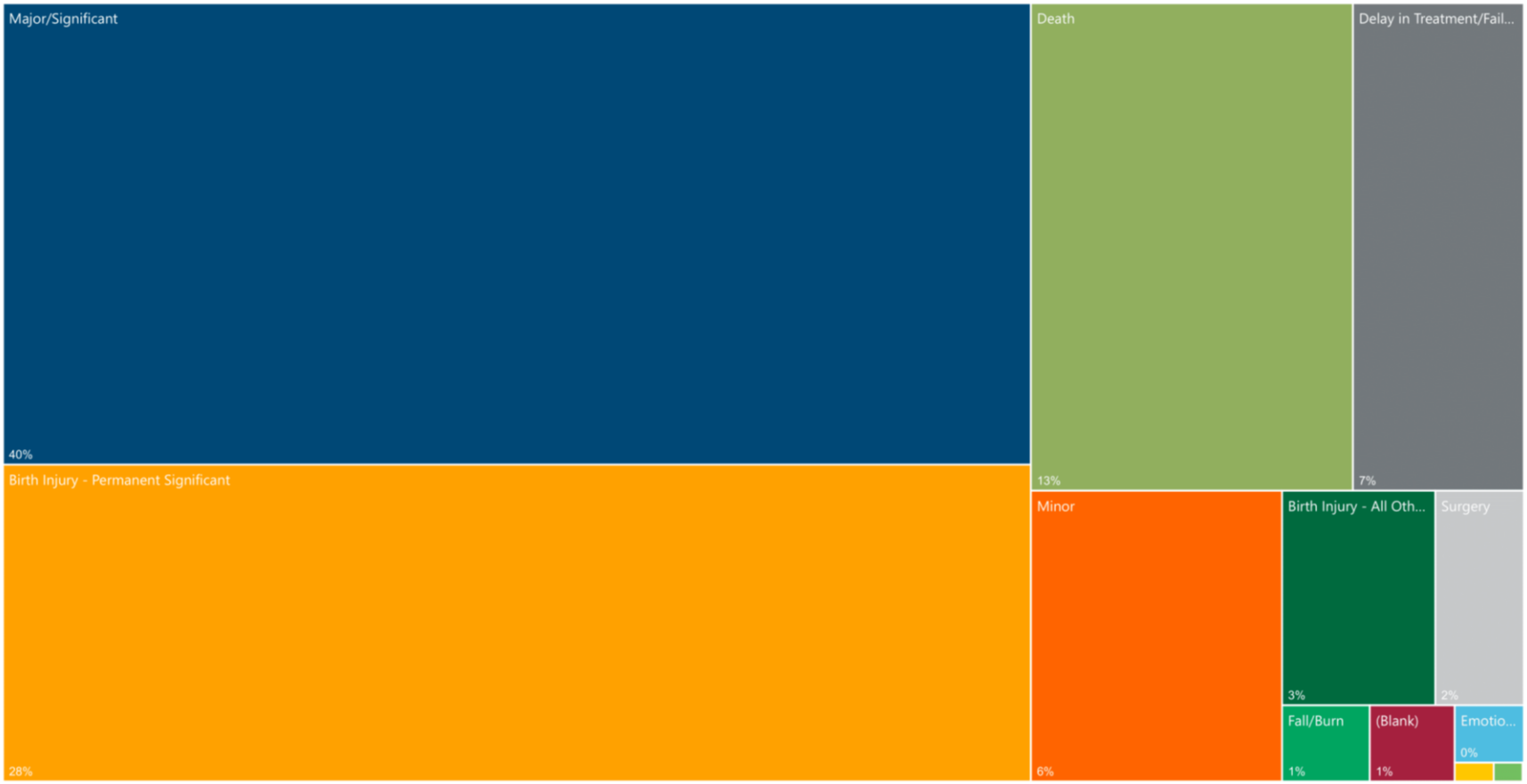


Exhibit excludes losses where type of injury is other/unknown based on information provided in Maryland Hospital Survey (14% of unlimited losses).

Exhibit 13. Distribution of Loss (Limited to $10 Million per Event Basis) by Type of Injury

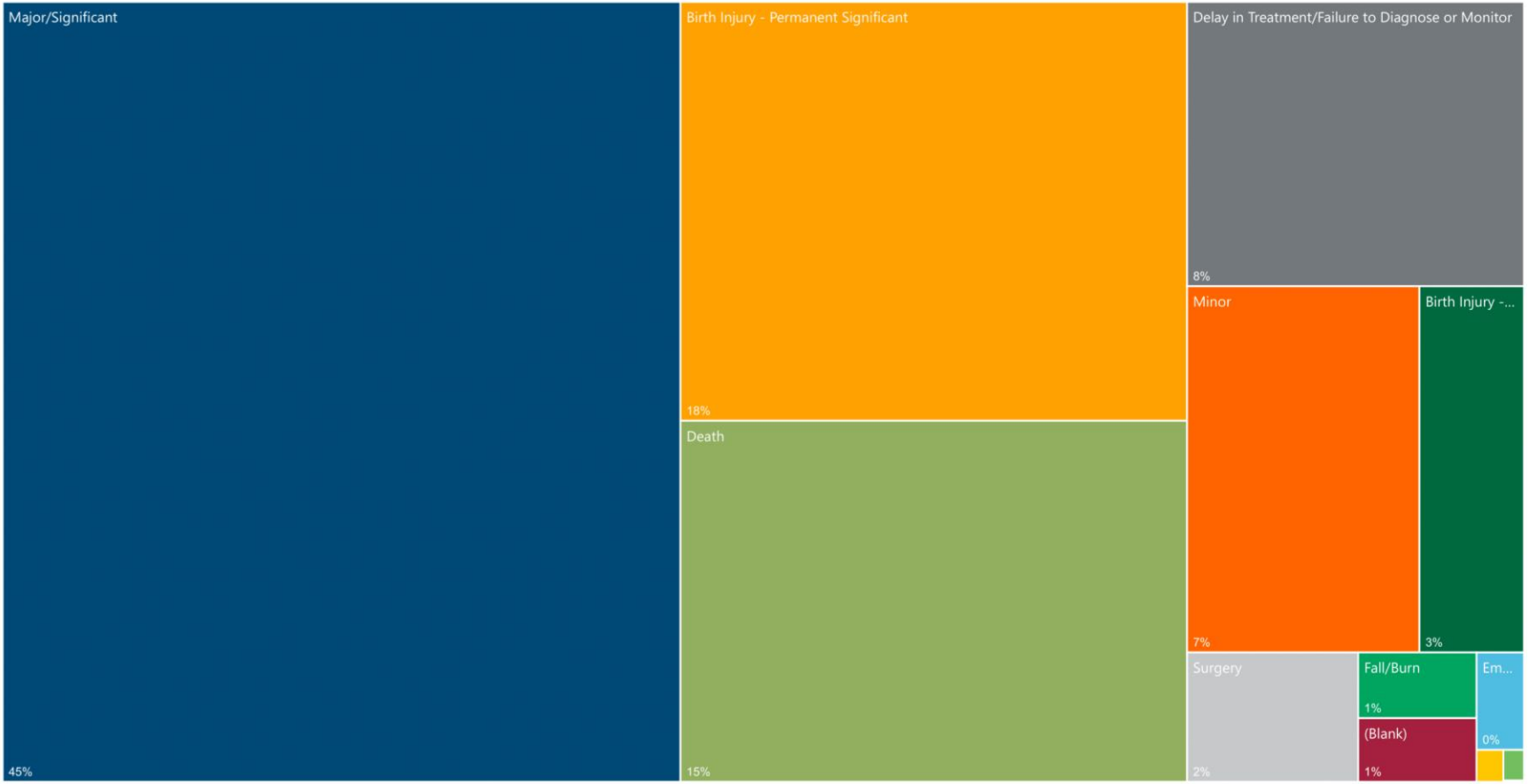
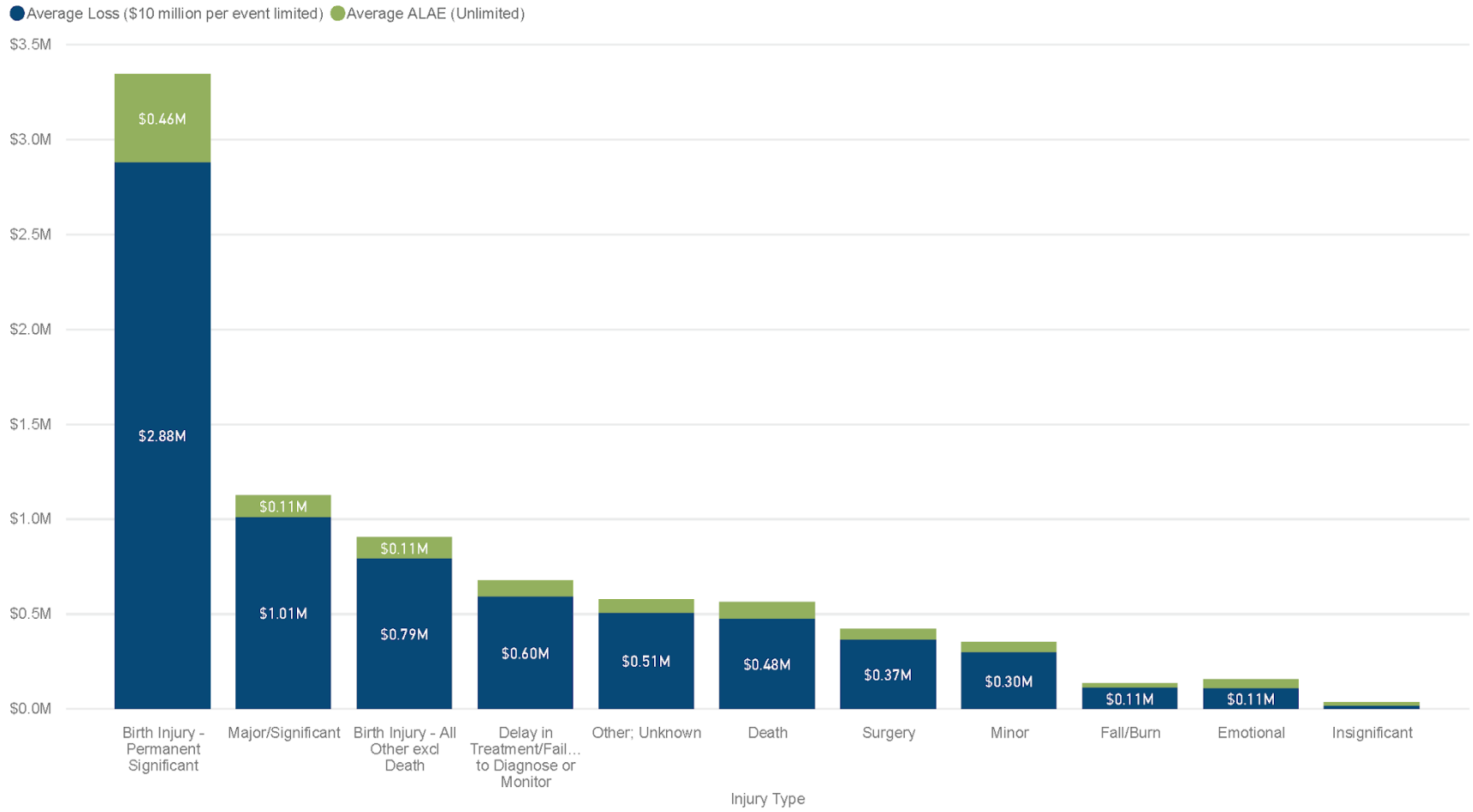


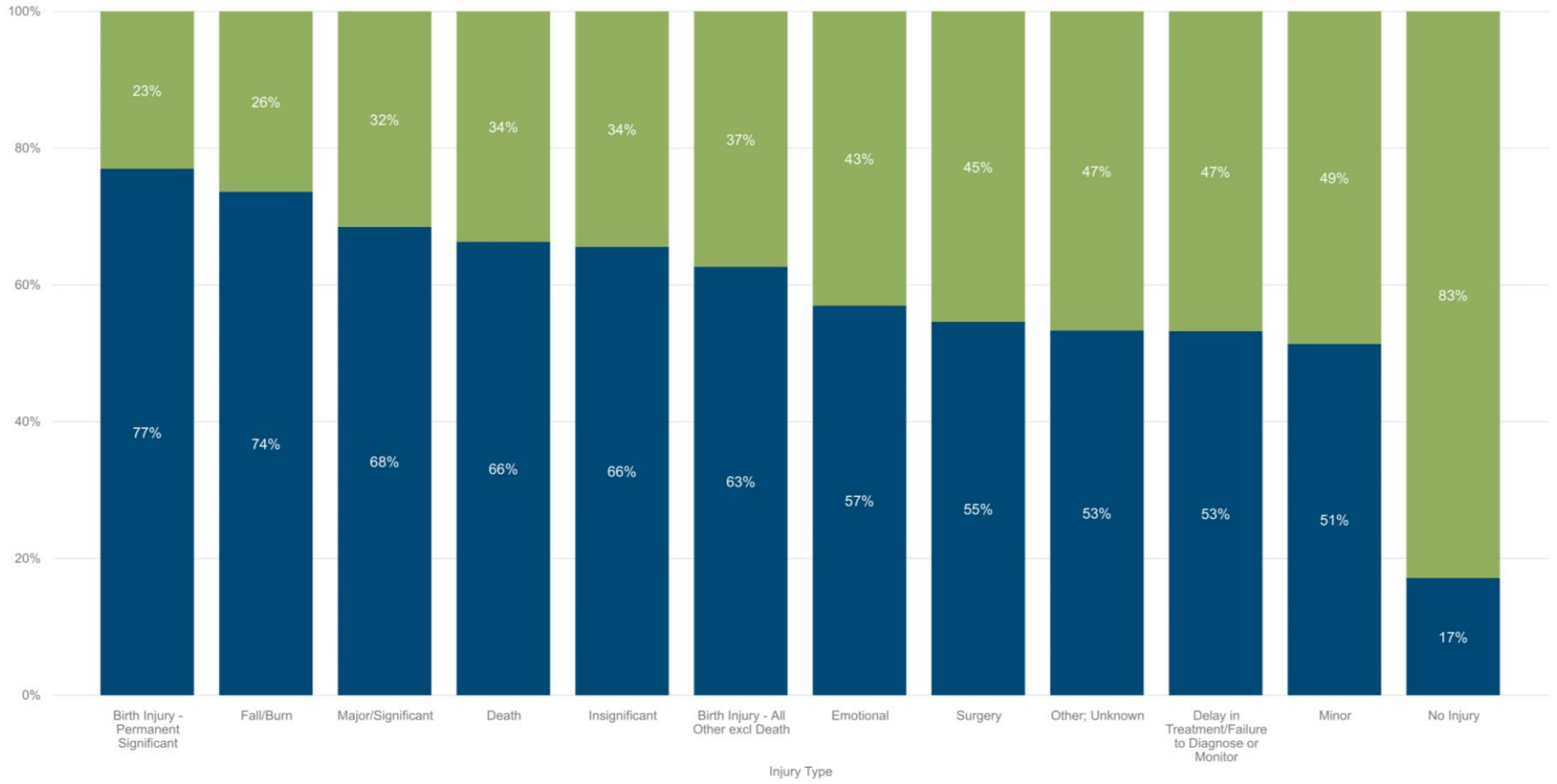
Exhibit excludes losses where type of injury is other/unknown based on information provided in Maryland Hospital Survey (16% of $10 million per event limited losses).

Exhibit 14. Average Severity (Claims with Loss Payment) by Type of Injury (Minimum 25 Claims)



Loss and expense amounts not trended for purposes of this exhibit.

Exhibit 15. Distribution of Claim Resolution by Type of Injury (Minimum 25 Claims)



Summary Exhibit 1. Impact of MICRA on Loss Costs

Impact of MICRA on Loss Costs
Unlimited

	Component	Value	Source
(1)	Impact of Exception to Collateral Source Offset	7%	Exhibit A1
(2)	Impact of Decrease in Cap on Damages	13%	Exhibit B1
(3)	Impact of Claim Frequency	5%	Exhibit C1
(4)	**Indicated Decrease in Loss Costs**[1]	23%	

[1] Calculated as 1 - [1 - (1)] × [1 - (2)] × [1 - (3)]

Exhibit A1. Effect of Adjustment to Collateral Source Rule on Claim Severity

Effect of Adjustment to Collateral Source Rule on Claim Severity

	Component	Source	Indicated Value
(1)	Estimated Portion of Losses Related to Medical Care Under Collateral Source Rule ("CSR")	Exhibit A3	65.0%
(2)	Estimated Portion of Medical Care Paid by Private Health Insurance (Under CSR)	Exhibit A2	13.5%
(3)	Reduction in MPL Costs Due to Exception to CSR	= (1) × (2)	8.8%
(4)	Selected Decrease in Indemnity Costs Under Exception to CSR[1]		7.1%
(5)	Indicated Decrease in Defense Costs Under Exception to CSR[2]		4.2%
(6)	Current Portion of Loss Costs Stemming from Indemnity	Exhibit A5	82.8%
(7)	Indicated Decrease in Indemnity and Defense Costs Under Exception to CSR	= (6)×(4) + [1-(6)]×(5)	6.6%
(8)	**Selected Decrease in Indemnity and Defense Costs Under Exception to CSR**		**7.0%**

[1] Reduced to reflect limit of $10M per event and assuming a lognormal distribution with limited mean of $1,050,000 at $10M limit and coefficient of variation of 4.25 from Exhibits G.

[2] Based on log-linear relationship between loss and ALAE with 60.0% slope, as estimated on Exhibit F1.

Note: Indication assumes no impact from economic costs other than medical care.

Exhibit A2. Estimated Portion of Medical Costs Paid by Health Insurance Coverage, MPL Claims

Estimated Portion of Medical Costs Paid by Health Insurance Coverage, MPL Claims

	Component	Indicated Value
(1)	Maryland Uninsured Rate[1]	5.9%
(2)	Portion of Maryland Residents Covered by Medicaid[1]	14.1%
(3)	Portion of Maryland Residents Covered by Medicare[1]	16.4%
(4)	Portion of Maryland Residents Covered by Individual Health Insurance	5.3%
(5)	Portion of Maryland Residents Covered by Employer Sponsored Health Insurance[1]	58.3%
(6)	Portion of Employer Sponsored Health Insurance on Self-Funded Plan[2]	61.0%
(7)	Portion of Maryland Residents Potentially Impacted by Exception to Collateral Source Rule (4) + (5) x [1 - (6)]	28.0%
(8)	Estimated Minimum Out-of-Pocket Costs for Insured Population[3]	0
(9)	Estimated Maximum Out-of-Pocket Costs for Insured Population[4]	8,550
(10)	Estimated Average Medical Costs per MPL Claim; (Exhibit A3)	162,500
(11)	Estimated Average Past Medical Costs per MPL Claim[5]	81,250
(12)	Indicated Portion of Medical Costs Potentially Impacted Based on Min Out-of-Pocket Costs; (7) × [1 - (8) / (10)] x [(11) / (10)]	14.0%
(13)	Indicated Portion of Medical Costs Potentially Impacted Based on Max Out-of-Pocket Costs; (7) × [1 - (9) / (10)] x [(11) / (10)]	13.3%
(14)	**Selected Portion of Medical Costs Potentially Impacted by Exception to Collateral Source Rule**	**13.5%**

[1] Based on data retrieved December 29, 2020 from:
http://statehealthcompare.shadac.org/table/11/health-insurance-coverage-type-by-total#22/5,4,1,10,86,9,8,6/25/21,22

[2] Based on data from http://files.kff.org/attachment/Report-Employer-Health-Benefits-Annual-Survey-2019 (Page 171)

[3] Assumes out-of-pocket maximum is already exhausted prior to MPL event, therefore $0 is contributed by claimant.

[4] Assumes out-of-pocket maximum is incurred, based on data retrieved December 29, 2020 from:
https://www.healthcare.gov/glossary/out-of-pocket-maximum-limit/

[5] Calculated as (10) × Exhibit A4 selection for past medical expenses of 50.0%.

Exhibit A3. Indicated Portion of MPL Loss Costs Consisting of Medical Care and Average Medical Loss per Claim

Indicated Portion of MPL Loss Costs Consisting of Medical Care and Average Medical Loss per Claim
Based on Data from the Louisiana Patient's Compensation Fund

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
					= (4) / (3)	= (4) / (2)	
	Calendar Year	Claims Settled[1]	Indemnity Payments[1]	Medical Payments[1]	Portion Medical	Average Medical Per Claim	Average Medical Per Claim Trended at 5.0% per Annum to 2020
	2010	356	114,086,409	38,986,892	34.2%	109,514	178,386
	2011	284	106,549,917	41,508,394	39.0%	146,156	226,736
	2012	286	99,875,425	41,162,749	41.2%	143,926	212,644
	2013	276	101,828,300	53,717,236	52.8%	194,628	273,861
	2014	288	93,028,105	56,188,798	60.4%	195,100	261,453
	2015	328	81,612,364	38,573,385	47.3%	117,602	150,093
	2016	268	74,346,073	49,759,309	66.9%	185,669	225,682
	2017	284	87,526,089	51,278,252	58.6%	180,557	209,018
	2018	321	117,821,750	77,800,104	66.0%	242,368	267,211
	2019	310	105,717,417	85,028,099	80.4%	274,284	287,998
	Total	3,001	982,391,849	534,003,218	54.4%	177,942	227,833
	Last Five	1,511	467,023,693	302,439,149	64.8%	200,158	227,749
	Last Three	915	311,065,256	214,106,455	68.8%	233,996	256,191
(8)	**Selected**				**65.0%**		**240,000**
(9)	Assumed Average Medical Cost per Medical Claim in Primary Layer, Claims Covered by Louisiana PCF[2]						50,000
(10)	Estimated Average Medical Cost per Medical Claim Under CSR, Primary and PCF Layers; (8) + (9)						290,000
(11)	Assumed Portion of Louisiana MPL Claims in Louisiana PCF Coverage Layer						50.0%
(12)	Assumed Average Medical Cost per Medical Claim, Claims Not Entering Louisiana PCF Coverage Layer						35,000
(13)	Estimated Average Medical Cost per Medical Claim Under CSR; (10) × (11) + (12) × [1 - (11)]						162,500
(14)	**Estimated Average Medical Cost per Medical Claim Under Collateral Source Rule**						**162,500**

[1] Obtained from pages 15 and 17 of https://www.doa.la.gov/pcf/AnnualLegisRpt/AnnualLegisRpt2020.pdf
[2] Assumes on average half of primary layer of coverage ($100,000) is medical costs.

Exhibit A4. Indicated Split of Past and Future MPL Costs

Indicated Split of Past and Future MPL Medical Costs
Based on Data from the Louisiana Patient's Compensation Fund[1]

Calendar Year	(1) Past Medical Costs	(2) Future Medical Costs	(3) Total Medical Costs	(4) = (1) / (3) Ratio of Past Costs to Total Costs
2010	19,729,194	19,257,698	38,986,892	50.6%
2011	20,700,324	20,808,070	41,508,394	49.9%
2012	23,143,778	18,018,971	41,162,749	56.2%
2013	31,191,636	22,525,600	53,717,236	58.1%
2014	30,022,848	26,165,950	56,188,798	53.4%
2015	18,648,276	19,925,109	38,573,385	48.3%
2016	20,437,267	29,322,042	49,759,309	41.1%
2017	28,098,470	23,179,782	51,278,252	54.8%
2018	42,828,182	34,971,922	77,800,104	55.0%
2019	39,670,293	45,357,806	85,028,099	46.7%
Total (2010+)	274,470,268	259,532,950	534,003,218	51.4%
Total (2015+)	149,682,488	152,756,661	302,439,149	49.5%
Total (2018+)	82,498,475	80,329,728	162,828,203	50.7%
Indicated Portion of Past Medical Costs at Time of Award				**50.0%**

[1] From page 17 of https://www.doa.la.gov/pcf/AnnualLegisRpt/AnnualLegisRpt2020.pdf

Exhibit A5. Indemnity as a Portion of Total Loss Costs, Prior to Exception to Collateral Source Rule

Indemnity as a Portion of Total Loss Costs, Prior to Exception to Collateral Source Rule

	Selected Components, Prior to Repeal of Exception to CSR	Source	Indicated Value
(1)	Average Indemnity on CWI Events Limited to $10M per Event	Exhibit D2	1,050,000
(2)	CWI Ratio	Exhibit D1	60.0%
(3)	Average ALAE on CWE Events	Exhibit D3	72,500
(4)	Average ALAE on CWI Events	Exhibit D4	169,500
(5)	**Indicated Indemnity as a Portion of Total Loss Cost[1]**		**82.8%**

[1] Calculated as (1) × (2) / { [(1) + (4)] × (2)] + (3) × [1 - (2)] }

Exhibit A6. Selected Loss Severity, Adjusted for Exception to Collateral Source Rule

Selected Loss Severity, Adjusted for Exception to Collateral Source Rule

	Component	Source	Indicated Value Limited to $10M per Event
(1)	Selected Loss Severity Under Collateral Source Rule	Exhibit D2	1,050,000
(2)	Indicated Decrease Due to Exception to CSR	Exhibit A1	7.1%
(3)	Indicated Indemnity Severity Under Exception to CSR	= (1) × [1 - (2)]	975,420
(4)	**Selected Indemnity Severity Under Exception to CSR**		**975,000**

Exhibit A7. Selected ALAE Severity on CWE Events, Adjusted for Exception to Collateral Source Rule

Selected ALAE Severity on CWE Events, Adjusted for Exception to Collateral Source Rule

	Component	Source	Indicated Value
(1)	Selected ALAE Severity on CWE Events Under Collateral Source Rule	Exhibit D3	72,500
(2)	Indicated Decrease Due to Exception to CSR	Exhibit A1	4.2%
(3)	Indicated ALAE Severity on CWE Events Under Exception to CSR	= (1) × [1 - (2)]	69,453
(4)	**Selected ALAE Severity on CWE Events Under Exception to CSR**		**69,500**

Exhibit A8. Selected ALAE Severity on CWI Events, Adjusted for Exception to Collateral Source Rule

Selected ALAE Severity on CWI Events, Adjusted for Exception to Collateral Source Rule

	Component	Source	Indicated Value
(1)	Selected ALAE Severity on CWI Events Under Collateral Source Rule	Exhibit D4	169,500
(2)	Indicated Decrease Due to Exception to CSR	Exhibit A1	4.2%
(3)	Indicated ALAE Severity on CWI Events Under Exception to CSR	= (1) × [1 - (2)]	162,376
(4)	**Selected ALAE Severity on CWI Events Under Exception to CSR**		**162,000**

Exhibit B1. Indicated Decrease in Severity Under Decreased Cap on Damages

Indicated Decrease in Severity Under Decreased Cap on Damages

	(1)	(2)	(3) (2) / (1) -1
	No Policy Limit		
	Simulated Mean		
Component	Current Tort Environment Adjusted for Exception to CSR	MICRA Tort Environment incl. $250K Non-Econ Damage Cap	Impact due to $250K Non-Econ Damage Cap
Indemnity per CWI Occurrence	1,230,000 [1]	1,063,900 [4]	-14%
ALAE per CWI Occurrence	161,000 [2]	143,100 [4]	-11%
ALAE per CWE Occurrence	70,100 [3]	62,300 [4]	-11%
Indemnity & ALAE per Occurrence	863,000 [5]	749,000 [5]	-13%

[1] Equals the unlimited indemnity per non-zero claim, shown on Exhibit B2. Any differences due to simulation rounding.
[2] Equals ALAE per closed with indemnity claim, shown on Exhibit B2. Any differences due to simulation rounding.
[3] Equals ALAE per closed with expense claim, shown on Exhibit B2. Any differences due to simulation rounding.
[4] Results of simulation modeling consistent with parameters listed above and other parameter assumptions as given in the following exhibits.
[5] Total indemnity and ALAE per occurrence has been calculated based on the portion of claims that close with indemnity versus close with expense.

Exhibit B2. Summary of Model Parameters

Summary of Parameters

Parameter	Mean Value	Distribution	Reference	Data Source
Closed With Indemnity Ratio	60.0%	N/A	Exhibit D1	Maryland Hospitals Survey
Closed With Expense Ratio	40.0%	N/A	Exhibit D1	Maryland Hospitals Survey
Probability of Economic Indemnity Only	3.0%		Exhibit G2	TX DOI, Maryland Hospitals Survey
Probability of Non-Economic Indemnity Only	19.0%		Exhibit G2	TX DOI, Maryland Hospitals Survey
Probability of Both Economic and Non-Economic Indemnity	78.0%		Exhibit G2	TX DOI, Maryland Hospitals Survey
Non-Economic Indemnity Per Non-Zero Claim[1]	633,102	Lognormal -- CV of 2.75	Exhibits E6, E1, G1 and F4	TX DOI, Maryland Hospitals Survey
Economic Indemnity Per Non-Zero Claim[1,2]	445,544	Lognormal -- CV of 4.00	Exhibits G1, E1, G1 and E2	TX DOI, Maryland Hospitals Survey
Correlation Between Economic and Non-Economic	0.60		Exhibit G3	TX DOI, Maryland Hospitals Survey
Selected Limited Total Indemnity Severity[1]	975,000	Lognormal -- CV of 4.25	Exhibit A6 and E6	Maryland Hospitals Survey
Selected Unlimited Total Indemnity Severity[3]	1,227,000			Maryland Hospitals Survey
ALAE per Closed With Expense Claim[4]	69,500	N/A	Exhibit A7	Maryland Hospitals Survey
ALAE per Closed With Indemnity Claim[4]	162,000	N/A	Exhibit A8	Maryland Hospitals Survey
Slope of Relationship Between Ln(ALAE) and Ln(Loss)	0.600	N/A	Exhibit F1	Maryland Hospitals Survey
Wrongful Death Ratio	18.0%		Exhibit D8	Maryland Hospitals Survey

[1] At $10M Limit per event with a non-economic cap on damages of $845,000 for non-wrongful death events or $1,056,250 for wrongful death events.
[2] Economic portion of losses has been adjusted for estimated decrease in severity due to Exception to the Collateral Source Rule.
[3] The unlimited indemnity per non-zero claim is derived from the limited indemnity per non-zero claim and the modeled distribution.
[4] Unlimited ALAE per event with a non-economic cap on damages of $845,000 for non-wrongful death events or $1,056,250 for wrongful death events.

Exhibit C1. Selected Impact on Frequency

Selected Impact on Frequency

	Impact of Cap on Damages on Frequency	Reference	Value
(1)	Empirical Effect of Implementing Cap -- Based on Tort Reform States	Exhibit C2	-20.0%
(2)	**Selected Impact on Loss Costs of Decreased Claims**		**-5.0%**

Note: Selected impact has been judgementally reduced from the indicated empirical impact due to Maryland's existing cap on non-economic damages as well as Maryland's high percentage of claims closed with indemnity payment in comparison to the countrywide average.

Exhibit C2. Impact on Frequency Based on Tort Reform States

Impact on Frequency - Based on Tort Reform States
Relative Frequency, Damage Cap Year as the Base Year[1]

(1)	(2)	(3) = (2) / (15) - 1	(4)	(5) = (4) / (14) - 1	(6)	(7) = (6) / (16) - 1	(8)	(9) = (8) / (16) - 1	(10)	(11) = (10) / (17) - 1	(12)	(13) = (12) / (15) - 1	(14)	(15)	(16)	(17)
	Tort Reform States												Countrywide[2] - Varying Start Years			
Calendar Year	FL	Change in FL Relative to Countrywide[2]	MS	Change in MS Relative to Countrywide[2]	NV	Change in NV Relative to Countrywide[2]	OK	Change in OK Relative to Countrywide[2]	SC	Change in SC Relative to Countrywide[2]	TX	Change in TX Relative to Countrywide[2]	2002	2003	2004	2005
2001																
2002			1.00	0.0%									1.00			
2003	1.00	0.0%	0.69	-28.8%							1.00	0.0%	0.97	1.00		
2004	0.87	-5.5%	0.63	-29.9%	1.00	0.0%	1.00	0.0%			0.98	5.7%	0.90	0.92	1.00	
2005	0.81	-8.3%	0.56	-35.1%	1.03	8.2%	1.08	13.2%	1.00	0.0%	0.92	3.7%	0.86	0.88	0.95	1.00
2006	0.63	-21.8%	0.65	-16.0%	0.80	-7.4%	0.79	-8.8%	1.01	11.3%	0.57	-28.8%	0.78	0.80	0.86	0.91
2007	0.58	-17.7%	0.59	-14.3%	0.76	-0.6%	0.97	26.1%	1.05	31.2%	0.48	-32.0%	0.69	0.71	0.77	0.80
2008	0.63	-5.1%	0.51	-21.0%	0.68	-5.8%	0.85	17.0%	0.74	-1.7%	0.40	-40.0%	0.65	0.67	0.72	0.76
2009	0.57	-10.9%	0.46	-26.4%	0.70	0.6%	0.92	31.9%	0.63	-13.8%	0.40	-38.2%	0.63	0.64	0.70	0.73
2010	0.53	-11.0%	0.42	-27.8%	0.47	-27.7%	0.66	1.4%	0.60	-11.9%	0.38	-36.1%	0.58	0.60	0.65	0.68
2011	0.48	-17.5%	0.43	-24.3%	0.51	-17.9%	0.68	8.5%	0.53	-19.3%	0.33	-43.4%	0.56	0.58	0.63	0.66
2012	0.43	-20.7%	0.57	6.6%	0.44	-26.0%	0.54	-8.8%	0.61	-1.8%	0.33	-39.6%	0.53	0.55	0.59	0.62
2013	0.44	-20.6%	0.38	-30.1%	0.49	-19.0%	0.75	23.9%	0.56	-11.5%	0.30	-46.5%	0.54	0.56	0.61	0.63
2014	0.47	-11.5%	0.44	-13.8%	0.41	-28.0%	0.64	12.8%	0.49	-17.9%	0.28	-46.4%	0.51	0.53	0.57	0.60
2015	0.48	-3.5%	0.26	-45.6%	0.46	-14.9%	0.55	2.3%	0.44	-22.0%	0.24	-51.1%	0.49	0.50	0.54	0.57
All Year Average[3]		-14.0%		-22.5%		-15.5%		12.8%		-12.5%		-40.2%				
Three-Year Average[3]		-14.9%		-21.8%		-1.9%		25.0%		-9.1%		-33.6%				
Five-Year Average[3]		-13.3%		-22.5%		-10.3%		17.0%		-9.7%		-35.0%				
Indicated Impact of Enacting Damage Cap		-14.0%		-22.5%		-15.5%		12.8%		-12.5%		-40.2%				
Weight[4]		44%		5%		3%		5%		6%		36%				
Wtd Avg Impact of Enacting Damage Cap[5]		-22.3%														
Selected Impact of Damage Cap		**-20.0%**														

[1] Based on the frequencies calculated on Exhibit C3, normalized to the year of tort reform.
[2] Excluding tort reform impacted states: FL, MS, NV, OK, SC, TX, & OR.
[3] All averages begin three years subsequent to the Base Year.
[4] Weights are based on the number of claims closed with indemnity in the base year (i.e., year in which the cap was enacted).
[5] Weighted average of Indicated Impact of Enacting Damage Cap for each Tort Reform State, where the weights are as given above.

Exhibit C3. Historical Frequency by State

Historical Frequency - Defined as Closed With Indemnity Claims per Physician [1]
Year of Cap Implementation Shaded in Blue; Year of Cap Overturn Shaded in Green

Calendar Year	Frequency by State							Countrywide[2]
	FL	MS	NV	OK	SC	TX	MD	
2001	3.31%	3.01%	2.36%	2.13%	2.30%	2.84%	1.53%	2.34%
2002	3.12%	3.27%	3.10%	1.90%	1.95%	2.58%	1.57%	2.08%
2003	3.28%	2.26%	2.63%	2.14%	1.95%	2.56%	1.63%	2.02%
2004	2.87%	2.06%	2.35%	2.48%	2.00%	2.50%	1.38%	1.87%
2005	2.66%	1.82%	2.42%	2.68%	2.13%	2.34%	1.28%	1.78%
2006	2.05%	2.14%	1.88%	1.96%	2.15%	1.45%	1.10%	1.62%
2007	1.92%	1.93%	1.79%	2.40%	2.25%	1.23%	1.01%	1.43%
2008	2.08%	1.68%	1.60%	2.10%	1.59%	1.02%	1.04%	1.35%
2009	1.89%	1.51%	1.65%	2.28%	1.34%	1.02%	1.02%	1.30%
2010	1.75%	1.38%	1.10%	1.63%	1.28%	0.98%	1.06%	1.21%
2011	1.57%	1.39%	1.20%	1.68%	1.13%	0.84%	1.17%	1.17%
2012	1.42%	1.85%	1.03%	1.34%	1.30%	0.84%	0.98%	1.10%
2013	1.46%	1.24%	1.15%	1.86%	1.20%	0.77%	1.59%	1.13%
2014	1.53%	1.45%	0.96%	1.60%	1.05%	0.72%	0.76%	1.07%
2015	1.59%	0.87%	1.08%	1.37%	0.94%	0.63%	0.78%	1.01%
2016	1.42%	0.95%	1.04%	1.19%	0.92%	0.64%	0.77%	0.94%
2017	1.64%	0.90%	1.20%	1.36%	1.01%	0.68%	0.86%	0.95%
2018	1.71%	0.79%	0.88%	1.39%	1.02%	0.63%	0.57%	0.90%
2019	1.58%	0.90%	0.83%	1.57%	1.19%	0.59%	0.64%	0.89%

[1] Note: Claim data from Milliman analysis of the National Practioner Data Bank Public Use File. Counts of active physicians from the American Medical Association's *Physician Characteristics and Distribution in the US* (multiple editions) and workforce data provided by the Association of American Medical Colleges.

[2] Excluding tort reform impacted states: FL, MS, NV, OK, SC, TX, & OR.

Exhibit C4. Tort Reform Caps by State

Tort Reform Caps by State from 1975 to 2020									
	Enactment 1			Enactment 2			Enactment 3		
State	Year Cap Created	Year Cap Overturned	Cap[1] Amount	Year Cap Created	Year Cap Overturned	Cap[1] Amount	Year Cap Created	Year Cap Overturned	Cap[1] Amount
Alabama	1987	1991	400k						
Alaska	1986		500k	1997		see below[2]	2005		250k/400k
Arizona									
Arkansas									
California	1975		250k						
Colorado	1986		250k	2003		300k			
Connecticut									
Delaware									
Florida	1986	1987	450k	1988		250k / 350k[3]	2003	2014	500k / 1M[4]
Georgia	2005	2010	350k[5]						
Hawaii	1986		375k						
Idaho	1975	1981[6]	150k/300k[7]	1987		400k	2003		250k[14]
Illinois	1975	1976	500k	1995	1997	500k	2005	2010	500k / 1M[8]
Indiana	1999		1.25M[9]	2017		1.65M[9]	2019		1.8M[9]
Iowa	2017		250k						
Kansas	1986	1988	250k/1M[10]	1988		250k	2014	2019	300k[11]
Kentucky									
Louisiana	1975		500k[9,12]						
Maine	1979		150k[13]	2009		500k[13]	2019		750k[13]
Maryland	1986		350k	1994		500k[14]	2005		650k[14,15]
Massachusetts	1986		500k[16]						
Michigan	1986		225k	1993		443k[14,17,18]			
Minnesota	1986	1990	400k						
Mississippi	2002		500k[11]	2004		500k			
Missouri	1986		350k[14, 19]	2005	2012	350k	2015		400k[20]
Montana	1995		250k						
Nebraska	1992		1.25M[9]	2003		1.75M[9]	2015		2.25M[9]
Nevada	2004		350k						
New Hampshire	1977	1980	250k	1986	1991	875k			
New Jersey									
New Mexico	1976		500k[9]	1995	2018	600k[9]			
New York									
North Carolina	2011		500k[14]						
North Dakota	1977	1978	300k	1983		500k/1M[7,9]	1995		500k
Ohio	1975	1991	200k	1997	1999	Formula[21]	2005		Formula[21]

Exhibit C4. Tort Reform Caps by State (Continued)

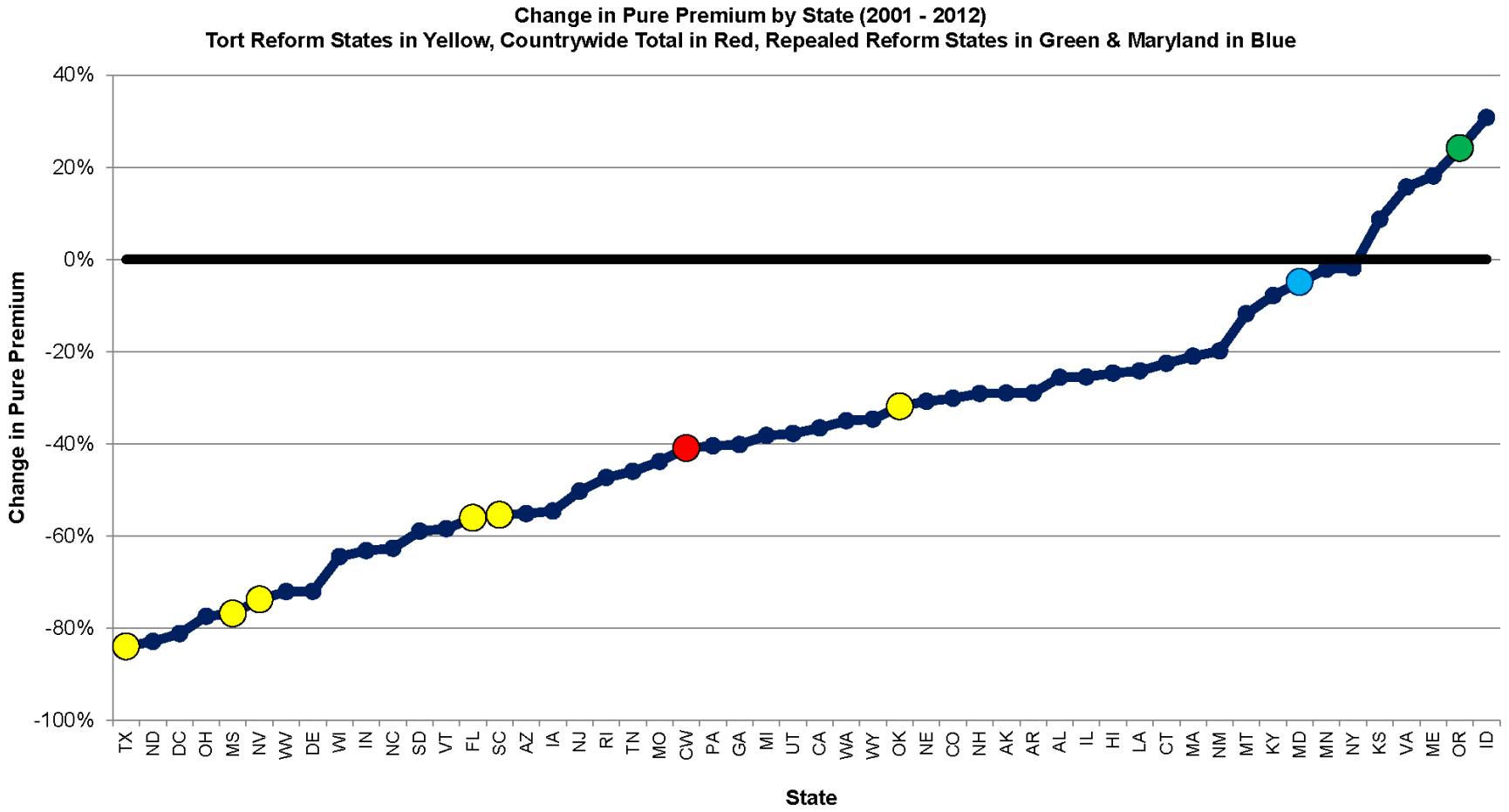
Oklahoma	2004		300k	2009		400k	2011	2019	350k
Oregon	1987	1999	500k	2011	2020	500k[13]			
Pennsylvania									
Rhode Island									
South Carolina	2005		350k[5]						
South Dakota	1976		500k	1986	1996	1M[9]	1996		500k
Tennessee	2011		750k						
Texas	1977	1990	500k[14]	2003		250k			
Utah	1986		250k[14]	2001		400k[14]	2010		450k
Vermont									
Virginia	1983		1M[9,11]	1999		1.5M[9,11]	2011		2.05M[9,11,22]
Washington	1986	1989	Formula[23]						
Washington, DC									
West Virginia	1986		1M	2003		250k[14]			
Wisconsin	1985	1990[6]	1M[14]	1995	2005	350k[14]	2006		750k
Wyoming									

Repeal States | Tort Reform States

[1] Applies to non-economic damages unless otherwise noted.
[2] max(400k, Life Expectancy x 8k)
[3] Varies based on admission of fault and arbitration.
[4] For practitioners; non-practitioners limits are 50% higher.
[5] 1.05M when multiple providers are involved.
[6] Cap not overturned, rather expired due to sunset provision.
[7] Per claimant / per occurrence.
[8] Physicians / hospitals.
[9] Cap for total damages.
[10] Non-economic / total damage cap.
[11] Includes an escalator provision for future years.
[12] Excludes future medical and related benefits.
[13] Wrongful death only.
[14] Adjusted annually for inflation.
[15] Currently at 845k.
[16] Not typically relied on as there are many exceptions.
[17] Basic / certain permanent disabilities.
[18] Currently at 466k / 832k.
[19] Per defendant.
[20] 700k for severe & death. Caps grow at 1.7% per year.
[21] min(max (250k, 3 x Econ. Dam.), 500k)
[22] Currently at 2.45M.
[23] 43%(wage *max(15, Life Expectancy))

Note: See Section 9.3 for discussion on definition of "Tort Reform States."

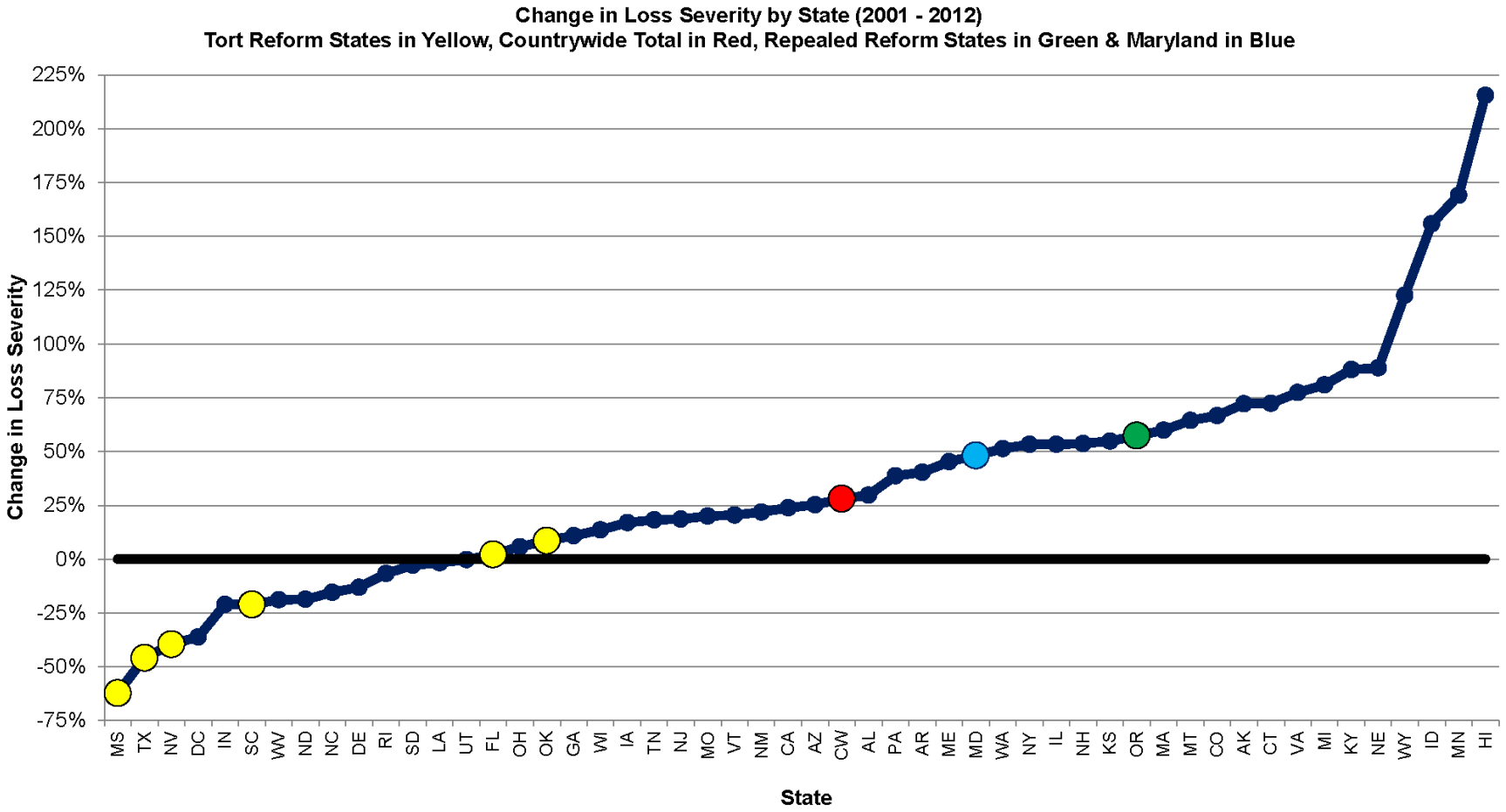
Exhibit C5. Change in Pure Premium by State



Data from the National Practitioner Data Bank. See Exhibit C8.
Pure Premium defined as paid loss per physician.

Note: See Section 9.3 for discussion on definition of "Tort Reform States."

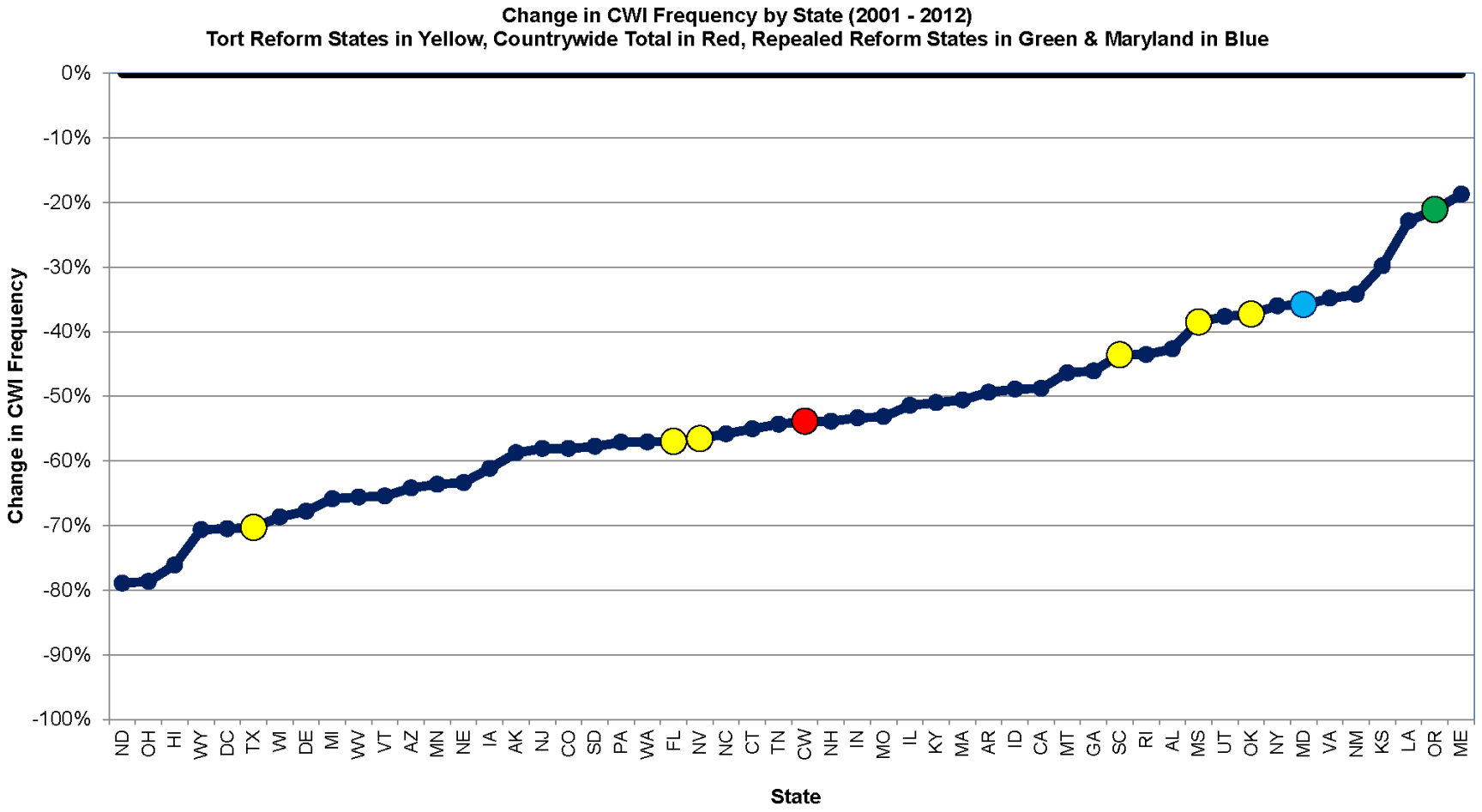
Exhibit C6. Change in Loss Severity by State



Data from the National Practitioner Data Bank. See Exhibit C8.
Severity defined as paid loss per closed with indemnity (CWI) claim.

Note: See Section 9.3 for discussion on definition of "Tort Reform States."

Exhibit C7. Change in CWI Frequency by State



Data from the National Practitioner Data Bank. See Exhibit C8.
Frequency defined as closed with indemnity (CWI) claims per physician.

Note: See Section 9.3 for discussion on definition of "Tort Reform States."

Exhibit C8. Change in Pure Premium, Severity, and Frequency by State

Percent Change from 2001 to 2012 by State

State	Change in Pure Premium	Change in Loss Severity	Change in Frequency
AK	-29.0%	72.2%	-58.7%
AL	-25.6%	29.7%	-42.7%
AR	-28.9%	40.5%	-49.4%
AZ	-55.1%	25.3%	-64.2%
CA	-36.5%	23.9%	-48.8%
CO	-30.1%	66.7%	-58.1%
CT	-22.5%	72.4%	-55.0%
DC	-81.1%	-36.2%	-70.5%
DE	-72.0%	-13.0%	-67.8%
FL	-56.0%	2.2%	-57.0%
GA	-40.2%	10.9%	-46.1%
HI	-24.7%	215.5%	-76.1%
IA	-54.6%	17.0%	-61.2%
ID	30.8%	155.9%	-48.9%
IL	-25.5%	53.4%	-51.4%
IN	-63.1%	-21.0%	-53.3%
KS	8.7%	54.9%	-29.8%
KY	-7.8%	88.1%	-51.0%
LA	-24.1%	-1.6%	-22.9%
MA	-21.0%	59.8%	-50.6%
MD	-4.9%	48.2%	-35.8%
ME	18.1%	45.3%	-18.7%
MI	-38.2%	81.0%	-65.8%
MN	-2.1%	169.0%	-63.6%
MO	-43.8%	20.0%	-53.2%
MS	-76.8%	-62.2%	-38.5%
MT	-11.7%	64.5%	-46.3%
NC	-62.6%	-15.4%	-55.8%
ND	-82.8%	-18.6%	-78.9%
NE	-30.8%	88.9%	-63.4%
NH	-29.1%	53.7%	-53.9%
NJ	-50.2%	18.6%	-58.1%
NM	-19.8%	21.9%	-34.2%
NV	-73.7%	-39.5%	-56.6%
NY	-1.8%	53.4%	-36.0%
OH	-77.4%	5.7%	-78.6%
OK	-31.9%	8.6%	-37.3%
OR	24.1%	57.4%	-21.1%
PA	-40.5%	38.7%	-57.1%
RI	-47.3%	-6.6%	-43.5%
SC	-55.4%	-21.0%	-43.6%
SD	-58.9%	-2.8%	-57.7%
TN	-46.0%	18.3%	-54.3%
TX	-83.9%	-45.8%	-70.3%
UT	-37.7%	-0.1%	-37.7%
VA	15.7%	77.5%	-34.8%
VT	-58.4%	20.5%	-65.4%
WA	-35.0%	51.4%	-57.1%
WI	-64.4%	13.6%	-68.7%
WV	-72.1%	-18.8%	-65.6%
WY	-34.6%	122.6%	-70.6%
CW	**-40.9%**	**28.2%**	**-53.9%**

Note: Claim data from Milliman analysis of the National Practioner Data Bank Public Use File. Counts of active physicians from the American Medical Association's *Physician Characteristics and Distribution in the US* (multiple editions) and workforce data provided by the Association of American Medical Colleges.

Exhibit D1. CWI and CWE Frequency

CWI and CWE frequency by closed year

Closed Year	(1) CWP Events	(2) CWI Events	(3) CWE Events	(4) (2) / (1) Percent CWI	(5) (3) / (1) Percent CWE
2010	313	188	125	60%	40%
2011	383	241	142	63%	37%
2012	426	253	173	59%	41%
2013	406	226	180	56%	44%
2014	429	251	178	59%	41%
2015	398	224	174	56%	44%
2016	401	233	168	58%	42%
2017	338	191	147	57%	43%
2018	469	302	167	64%	36%
2019	376	208	168	55%	45%
2020	286	198	88	69%	31%
Total (2010+):	4,225	2,515	1,710	60%	40%
Total (2015+):	2,268	1,356	912	60%	40%
Total (2018+):	1,131	708	423	63%	37%
Total (x 2020):	3,939	2,317	1,622	59%	41%
			Selected:	**60%**	**40%**

Exhibit D2. Trended Indemnity Severity

Trended indemnity severity by closed year

Closed Year	(1) CWI Events	(2) Limited to $10,000,000 per Event: Indemnity Paid Trended to 7/1/2020 [1]	(3) (2) / (1) Limited to $10,000,000 per Event: Indemnity Severity
2010	188	142,128,938	756,005
2011	241	167,469,204	694,893
2012	253	244,780,915	967,513
2013	226	191,194,354	845,993
2014	251	161,557,843	643,657
2015	224	159,158,131	710,527
2016	233	201,041,003	862,837
2017	191	175,296,867	917,785
2018	302	307,772,416	1,019,114
2019	208	176,419,306	848,170
2020	198	158,086,443	798,416
Total (2010+):	2,515	2,084,905,422	828,988
Total (2015+):	1,356	1,177,774,167	868,565
Total (2018+):	708	642,278,165	907,173
Total (x 2018):	2,213	1,777,133,006	803,042
Selected, Prior to Collateral Source Rule Adjustment at 7/1/2020:			823,000
Selected Trended to 7/1/2025:			**1,050,000** [1,2]

[1] Trended at 5.0% per annum (see Exhibit D5);

[2] See Exhibit D7 for derivation of average closed date

Exhibit D3. Trended ALAE Severity on CWE Events

Trended ALAE severity on CWE events by closed year

Closed Year	(1) CWE Events	(2) ALAE Paid on CWE Events	(3) (2) / (1) ALAE Severity on CWE Events	(4) ALAE Severity on CWE Events Trended to 7/1/2020 [1]
2010	125	3,301,897	26,415	43,030
2011	142	3,999,440	28,165	43,698
2012	173	5,083,432	29,384	43,414
2013	180	4,716,505	26,203	36,871
2014	178	3,928,159	22,068	29,576
2015	174	6,160,006	35,402	45,188
2016	168	6,152,298	36,621	44,513
2017	147	4,899,766	33,332	38,587
2018	167	8,188,072	49,030	54,060
2019	168	9,157,057	54,506	57,237
2020	88	5,798,894	65,897	65,897
Total (2010+):	1,710	61,385,527	35,898	44,709
Total (2015+):	912	40,356,094	44,250	49,842
Total (2018+):	423	23,144,024	54,714	57,784
Total (x 2020):	1,622	55,586,633	34,270	43,559
			Selected, Prior to Collateral Source Rule Adjustment at 7/1/2020:	57,960
			Selected Trended to 2/1/2025:	**72,500** [1,2]

[1] Trended at 5.0% per annum (see Exhibit D6)

[2] See Exhibit D7 for derivation of average closed date

Exhibit D4. Trended ALAE Severity on CWI Events

Trended ALAE severity on CWI events by closed year

Closed Year	(1) CWI Events	(2) ALAE Paid on CWI Events	(3) (2) / (1) ALAE Severity on CWI Events	(4) ALAE Severity on CWI Events Trended to 7/1/2020 [1]
2010	188	11,639,083	61,910	100,852
2011	241	16,849,769	69,916	108,474
2012	253	18,001,796	71,153	105,126
2013	226	16,084,850	71,172	100,149
2014	251	12,925,863	51,497	69,016
2015	224	22,055,407	98,462	125,677
2016	233	20,425,082	87,661	106,553
2017	191	26,150,671	136,915	158,501
2018	302	43,774,677	144,949	159,817
2019	208	24,948,581	119,945	125,955
2020	198	22,549,588	113,887	113,887
Total (2010+):	2,515	235,405,366	93,601	116,072
Total (2015+):	1,356	159,904,006	117,923	132,939
Total (2018+):	708	91,272,846	128,916	137,024
Total (x 2020):	2,317	212,855,778	91,867	116,259
Selected, Prior to Collateral Source Rule Adjustment at 7/1/2020:				132,810
Selected Trended to 7/1/2025:				**169,500** [1,2]

[1] Trended at 5.0% per annum (see Exhibit D6)

[2] See Exhibit D7 for derivation of average closed date

Exhibit D5. Indemnity Severity Trend

Indemnity severity trend by closed year

	(1)	(2)	(3) (2) / (1)	(4)	(5)
		Limited to $10,000,000 per Event			
Closed Year	CWI Events	Indemnity Paid	Indemnity Severity	Indicated Trend from Given Closed Year through 2020	R Squared
2010	188	87,254,839	464,121	6.6%	71.5%
2011	241	107,952,142	447,934	6.6%	65.3%
2012	253	165,677,358	654,851	5.7%	53.1%
2013	226	135,878,258	601,231	7.7%	66.2%
2014	251	120,556,950	480,307	9.5%	70.7%
2015	224	124,704,560	556,717	6.9%	53.2%
2016	233	165,396,931	709,858	2.6%	18.3%
2017	191	151,428,025	792,817	(1.1)%	4.1%
2018	302	279,158,654	924,366	(7.1)%	80.9%
2019	208	168,018,387	807,781	(1.2)%	100.0%
2020	198	158,086,443	798,416	NA	NA

Indicated Trend (2010+):	6.6%
Indicated Trend (2015+):	6.9%
Indicated Trend (2010-2016):	5.1%

Selected Trend:	**5.0%**

Exhibit D6. ALAE Severity Trend

ALAE severity trend by closed year

Closed Year	(1) CWP Events	(2) ALAE Paid	(3) (2) / (1) ALAE Severity	(4) Indicated Trend from Given Closed Year through 2020	(5) R Squared
2010	313	14,940,980	47,735	9.1%	71.1%
2011	383	20,849,209	54,437	9.7%	68.9%
2012	426	23,085,228	54,191	11.4%	71.7%
2013	406	20,801,356	51,235	13.3%	73.6%
2014	429	16,854,021	39,287	14.5%	69.5%
2015	398	28,215,413	70,893	8.3%	57.3%
2016	401	26,577,380	66,278	8.2%	42.9%
2017	338	31,050,437	91,865	0.3%	0.2%
2018	469	51,962,749	110,795	(5.4)%	30.8%
2019	376	34,105,638	90,706	9.3%	100.0%
2020	286	28,348,482	99,121	NA	NA

Indicated Trend (2010+):	9.1%
Indicated Trend (2015+):	8.3%
Indicated Trend (2010-2016):	4.3%

Selected Trend:	**5.0%**

Exhibit D7. Years from Report Date to Closed Date

Selected Report to Close and Accident to Report Lags

	(1)	(2)	(3)	(4)	(5)	(6)
	CWE Events		CWI Events		All Events	
Closed Year	Count of Events	Average Years From Report to Close	Count of Events	Average Years From Report to Close	Count of Events	Average Years From Acc to Report
2010	125	1.91	188	2.01	313	1.42
2011	142	2.00	241	2.21	383	1.41
2012	173	2.31	253	2.24	426	1.44
2013	180	1.76	226	2.06	406	1.32
2014	178	1.82	251	1.94	429	1.39
2015	174	1.87	224	2.14	398	1.35
2016	168	2.39	233	2.84	401	1.30
2017	147	1.72	191	2.13	338	1.38
2018	167	2.44	302	2.75	469	1.64
2019	168	1.76	208	2.14	376	1.56
2020	88	2.40	198	2.67	286	1.52
Total (2010+):	1,710	2.02	2,515	2.30	4,225	1.43
Total (2015+):	912	2.08	1,356	2.47	2,268	1.46
Total (2018+):	423	2.16	708	2.55	1,131	1.58
Total (x 2020):	1,622	2.00	2,317	2.27	3,939	1.42
	Selected:	**2.15**		**2.55**		**1.60**
Assumed Effective Date of Rates:		1/1/2022		1/1/2022		1/1/2022
Average Report Date:		1/1/2023		1/1/2023		1/1/2023
Average Close Date:		2/1/2025		7/1/2025		NA
Average Accident Date:		NA		NA		5/1/2021

Exhibit D8. Selected Portion of Claims Involving Wrongful Death

Selected Portion of Claims Involving Wrongful Death

Closed Year	(1) Wrongful Death CWI Count [1]	(2) Total CWI Count	(3) Portion of Claims Involving Wrongful Death
2010	45	188	23.9%
2011	38	241	15.8%
2012	43	253	17.0%
2013	42	226	18.6%
2014	46	251	18.3%
2015	39	224	17.4%
2016	33	233	14.2%
2017	27	191	14.1%
2018	60	302	19.9%
2019	39	208	18.8%
2020	41	198	20.7%
		Selected:	**18.0%**

[1] Based on death related injury types flagged from Maryland Closed Claim Data

Exhibit E1. Goodness of Distribution Fit Tests

Goodness of Distribution Fit Tests

		Goodness of Fit Test					
		Kolmogorov-Smirnov		Anderson-Darling		Chi-Square	
Indemnity Data Source:	**Fit**	Distribution	Test Statistic	Distribution	Test Statistic	Distribution	Test Statistic
Texas Closed Claim Database Economic Loss Only	Best	Lognormal	0.0241	Lognormal	1.2	Lognormal	61.8
	Second	Gamma	0.1498	Gamma	72.2	Weibull	563.1
	Third	Weibull	0.2146	Weibull	121.6	Gamma	579.2
Texas Closed Claim Database Non-Economic Loss Only	Best	Lognormal	0.0148	Lognormal	0.4	Lognormal	54.5
	Second	Gamma	0.1177	Gamma	48.1	Gamma	398.6
	Third	Weibull	0.1391	Weibull	74.9	Weibull	398.9
Maryland Hospitals Survey	Best	Lognormal	0.0584	Lognormal	16.4	Lognormal	275.7
	Second	Weibull	0.0835	Weibull	33.7	Weibull	322.3
	Third	Gamma	0.1174	Gamma	46.8	Gamma	423.8

Selected Indemnity Distribution: Lognormal

Note: Underlying indemnity has been trended at 5.0% per annum to an average closed date of 7/1/2025.

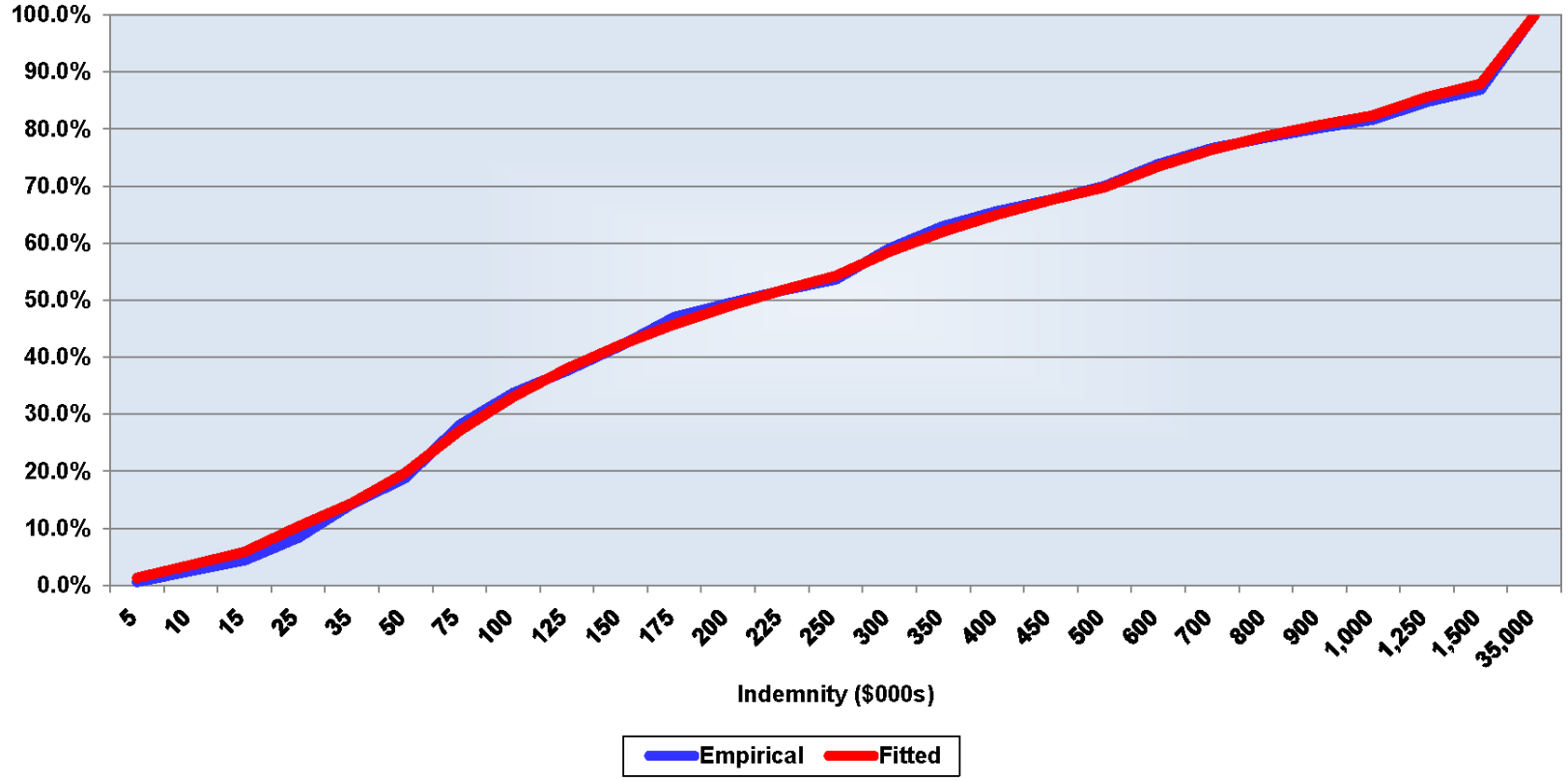
Exhibit E2. Selected Coefficient of Variation for Economic Loss Only (Texas Data)

Based on all Closed With Indemnity Claims, Trended at 5.0% to ,
Texas Closed Claim Data 2000-2005 (Economic Losses C
Cumulative Distribution Function

Loss Increment ($000's)	Actual Distribution	Lognormal Distribution Under Given Coefficient of Variation							
		3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
0-5	0.6%	0.8%	1.0%	1.1%	1.3%	1.5%	1.7%	1.9%	2.0%
5-10	2.5%	2.4%	2.8%	3.2%	3.5%	3.9%	4.2%	4.5%	4.8%
10-15	4.4%	4.4%	4.9%	5.4%	5.9%	6.3%	6.8%	7.2%	7.5%
15-25	8.3%	8.3%	9.0%	9.7%	10.3%	10.9%	11.5%	12.0%	12.4%
25-35	14.3%	12.1%	12.9%	13.7%	14.4%	15.0%	15.6%	16.2%	16.7%
35-50	18.9%	17.3%	18.2%	19.0%	19.8%	20.4%	21.0%	21.6%	22.1%
50-75	28.1%	24.7%	25.6%	26.4%	27.1%	27.7%	28.3%	28.8%	29.3%
75-100	33.7%	30.9%	31.7%	32.4%	33.0%	33.6%	34.1%	34.6%	35.0%
100-125	37.7%	36.1%	36.8%	37.4%	38.0%	38.5%	38.9%	39.3%	39.7%
125-150	42.0%	40.5%	41.2%	41.7%	42.2%	42.6%	43.0%	43.3%	43.6%
150-175	47.0%	44.4%	44.9%	45.4%	45.8%	46.1%	46.5%	46.7%	47.0%
175-200	49.5%	47.8%	48.2%	48.6%	48.9%	49.2%	49.5%	49.7%	49.9%
200-225	51.7%	50.8%	51.1%	51.5%	51.7%	52.0%	52.2%	52.4%	52.5%
225-250	53.6%	53.5%	53.8%	54.0%	54.2%	54.4%	54.6%	54.7%	54.9%
250-300	59.1%	58.1%	58.2%	58.4%	58.5%	58.6%	58.7%	58.8%	58.8%
300-350	63.0%	61.9%	61.9%	62.0%	62.0%	62.0%	62.1%	62.1%	62.1%
350-400	65.6%	65.1%	65.0%	65.0%	65.0%	65.0%	64.9%	64.9%	64.9%
400-450	67.6%	67.8%	67.7%	67.6%	67.5%	67.5%	67.4%	67.3%	67.3%
450-500	70.0%	70.2%	70.0%	69.9%	69.8%	69.7%	69.5%	69.5%	69.4%
500-600	73.8%	74.1%	73.9%	73.6%	73.4%	73.3%	73.1%	73.0%	72.8%
600-700	76.6%	77.2%	76.9%	76.6%	76.3%	76.1%	75.9%	75.7%	75.6%
700-800	78.5%	79.7%	79.3%	79.0%	78.7%	78.5%	78.2%	78.0%	77.8%
800-900	80.1%	81.7%	81.4%	81.0%	80.7%	80.4%	80.2%	79.9%	79.7%
900-1,000	81.6%	83.5%	83.1%	82.7%	82.4%	82.1%	81.8%	81.6%	81.3%
1,000-1,250	84.7%	86.8%	86.3%	85.9%	85.6%	85.3%	85.0%	84.7%	84.5%
1,250-1,500	86.9%	89.1%	88.7%	88.3%	87.9%	87.6%	87.3%	87.0%	86.8%
1,500-35,000	100.0%	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.8%	99.8%
Based on Individual Data Points		Chi-Squared Statistic							
Total	100%	184%	91%	63%	77%	118%	178%	250%	330%
Total $35K to $250K	39%	140%	63%	23%	10%	13%	29%	52%	81%
Total $35K to $1M	67%	146%	66%	25%	11%	15%	31%	55%	85%
		Kolmogorov-Smirnov Statistic							
Total	100%	3.9%	3.0%	2.5%	2.2%	2.8%	3.3%	3.8%	4.3%
Total $35K to $250K	39%	3.9%	3.0%	2.3%	1.8%	1.6%	2.2%	2.7%	3.2%
Total $35K to $1M	67%	3.9%	3.0%	2.3%	1.8%	1.6%	2.2%	2.7%	3.2%
		Anderson-Darling Statistic							
Total	100%	5	3	2	2	2	3	3	5
Total $35K to $250K	39%	1,814	1,785	1,761	1,739	1,721	1,704	1,689	1,676
Total $35K to $1M	67%	1,009	1,004	1,001	998	996	994	993	992

Exhibit E3. Empirical and Fitted Cumulative Distribution Function for Economic Loss Only

Based on all Closed With Indemnity Claims, Trended at 5.0% to July 1, 2025
Texas Closed Claim Data 2000-2005 (Economic Losses Only)
Cumulative Distribution Function



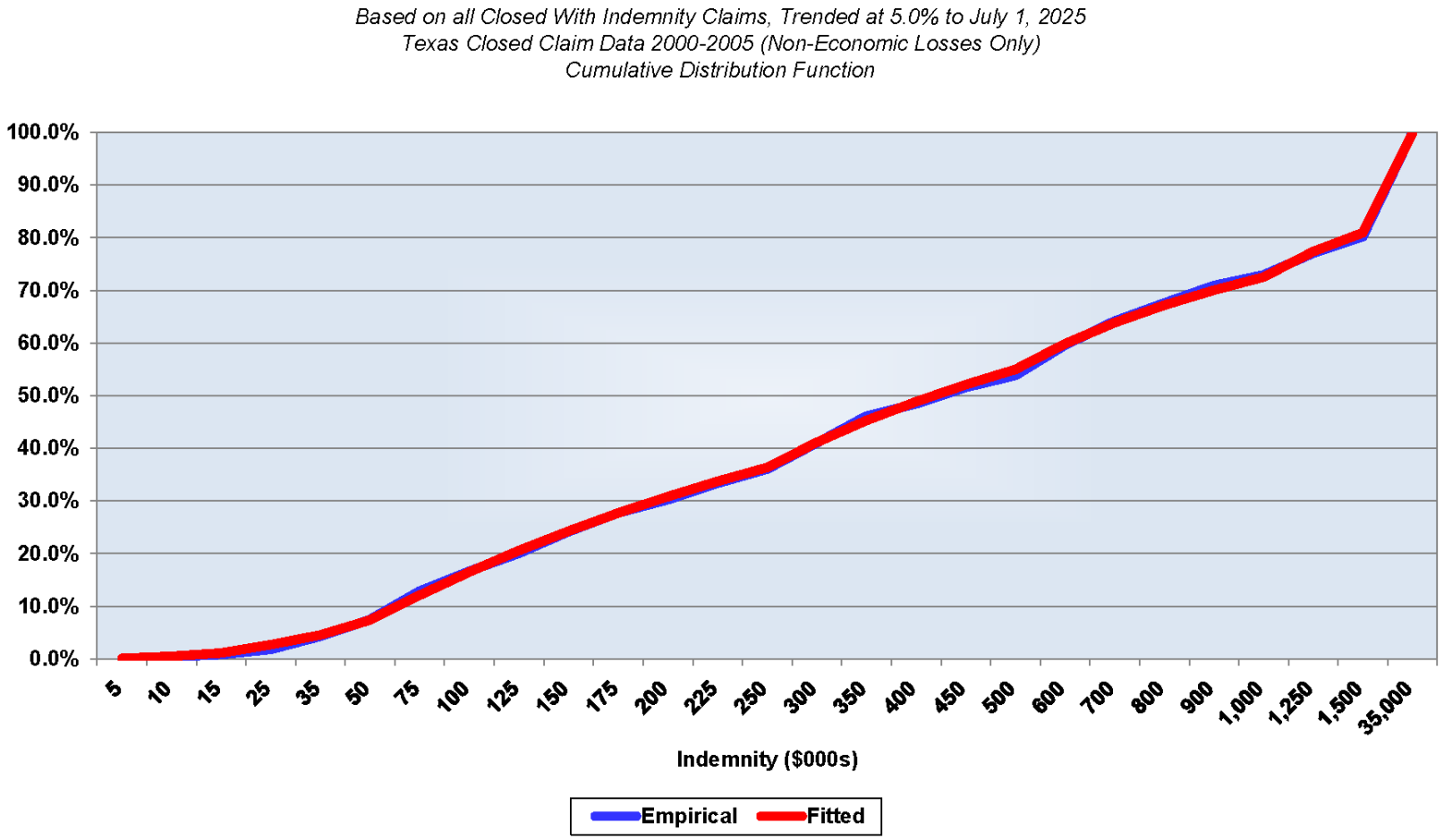
Note: Reference Exhibit E2 for the data points underlying the chart.

Exhibit E4. Selected Coefficient of Variation for Non-Economic Loss Only (Texas Data)

Based on all Closed With Indemnity Claims, Trended at 5.0% to July 1, 2025
Texas Closed Claim Data 2000-2005 (Non-Economic Losses Only)
Cumulative Distribution Function

Loss Increment ($000's)	Cumulative Percent of Claims in Increment	Lognormal Distribution Under Given Coefficient of Variation							
		2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75
0-5	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.3%	0.4%
5-10	0.4%	0.2%	0.3%	0.4%	0.5%	0.7%	0.9%	1.0%	1.2%
10-15	0.8%	0.4%	0.7%	0.9%	1.2%	1.4%	1.7%	1.9%	2.2%
15-25	1.9%	1.3%	1.8%	2.3%	2.7%	3.2%	3.6%	4.0%	4.4%
25-35	4.3%	2.5%	3.2%	3.9%	4.6%	5.1%	5.7%	6.2%	6.7%
35-50	7.5%	4.7%	5.7%	6.6%	7.4%	8.1%	8.8%	9.4%	10.0%
50-75	12.9%	8.7%	10.0%	11.1%	12.1%	13.0%	13.7%	14.4%	15.0%
75-100	16.7%	12.9%	14.3%	15.5%	16.5%	17.4%	18.2%	18.8%	19.4%
100-125	20.1%	16.9%	18.4%	19.6%	20.6%	21.4%	22.2%	22.8%	23.4%
125-150	24.1%	20.8%	22.2%	23.3%	24.3%	25.1%	25.8%	26.4%	26.9%
150-175	27.7%	24.4%	25.8%	26.8%	27.7%	28.4%	29.1%	29.6%	30.1%
175-200	30.2%	27.9%	29.1%	30.0%	30.8%	31.5%	32.0%	32.5%	32.9%
200-225	33.4%	31.1%	32.2%	33.0%	33.7%	34.3%	34.8%	35.2%	35.6%
225-250	36.0%	34.1%	35.0%	35.8%	36.4%	36.9%	37.3%	37.7%	38.0%
250-300	41.0%	39.5%	40.2%	40.7%	41.1%	41.5%	41.8%	42.0%	42.3%
300-350	46.1%	44.2%	44.7%	45.0%	45.3%	45.5%	45.7%	45.8%	46.0%
350-400	48.4%	48.4%	48.6%	48.8%	48.9%	49.0%	49.1%	49.1%	49.2%
400-450	51.6%	52.1%	52.1%	52.1%	52.1%	52.1%	52.1%	52.1%	52.0%
450-500	53.9%	55.4%	55.2%	55.1%	55.0%	54.8%	54.7%	54.7%	54.6%
500-600	59.6%	61.0%	60.5%	60.2%	59.8%	59.6%	59.3%	59.1%	58.9%
600-700	64.2%	65.6%	64.9%	64.3%	63.8%	63.4%	63.1%	62.8%	62.5%
700-800	67.6%	69.4%	68.5%	67.8%	67.2%	66.7%	66.3%	65.9%	65.6%
800-900	70.9%	72.5%	71.5%	70.7%	70.0%	69.5%	69.0%	68.5%	68.2%
900-1,000	72.9%	75.2%	74.1%	73.2%	72.5%	71.9%	71.3%	70.8%	70.4%
1,000-1,250	77.0%	80.4%	79.2%	78.2%	77.3%	76.6%	76.0%	75.4%	74.9%
1,250-1,500	80.2%	84.2%	82.9%	81.8%	80.9%	80.1%	79.4%	78.8%	78.3%
1,500-35,000	100.0%	100.0%	100.0%	99.9%	99.9%	99.8%	99.8%	99.7%	99.6%
Based on Individual Data Points		Chi-Squared Statistic							
Total	100%	805%	290%	80%	28%	62%	144%	251%	373%
Total $35K to $250K	32%	653%	235%	61%	9%	24%	75%	144%	224%
Total $35K to $1M	69%	688%	249%	66%	13%	31%	86%	163%	250%
		Kolmogorov-Smirnov Statistic							
Total	100%	4.7%	3.4%	2.3%	1.3%	1.7%	2.4%	3.0%	3.6%
Total $35K to $250K	32%	4.7%	3.4%	2.3%	1.3%	1.7%	2.4%	3.0%	5.3%
Total $35K to $1M	69%	4.7%	3.4%	2.3%	1.3%	1.7%	2.4%	3.0%	3.6%
		Anderson-Darling Statistic							
Total	100%	15	6	2	1	1	2	4	7
Total $35K to $250K	32%	2,141	2,023	1,932	1,859	1,799	1,749	1,707	1,671
Total $35K to $1M	69%	1,279	1,235	1,202	1,176	1,154	1,137	1,122	1,110

Exhibit E5. Empirical and Fitted Cumulative Distribution Function for Non-Economic Loss



Note: Reference Exhibit E4 for the data points underlying the chart.

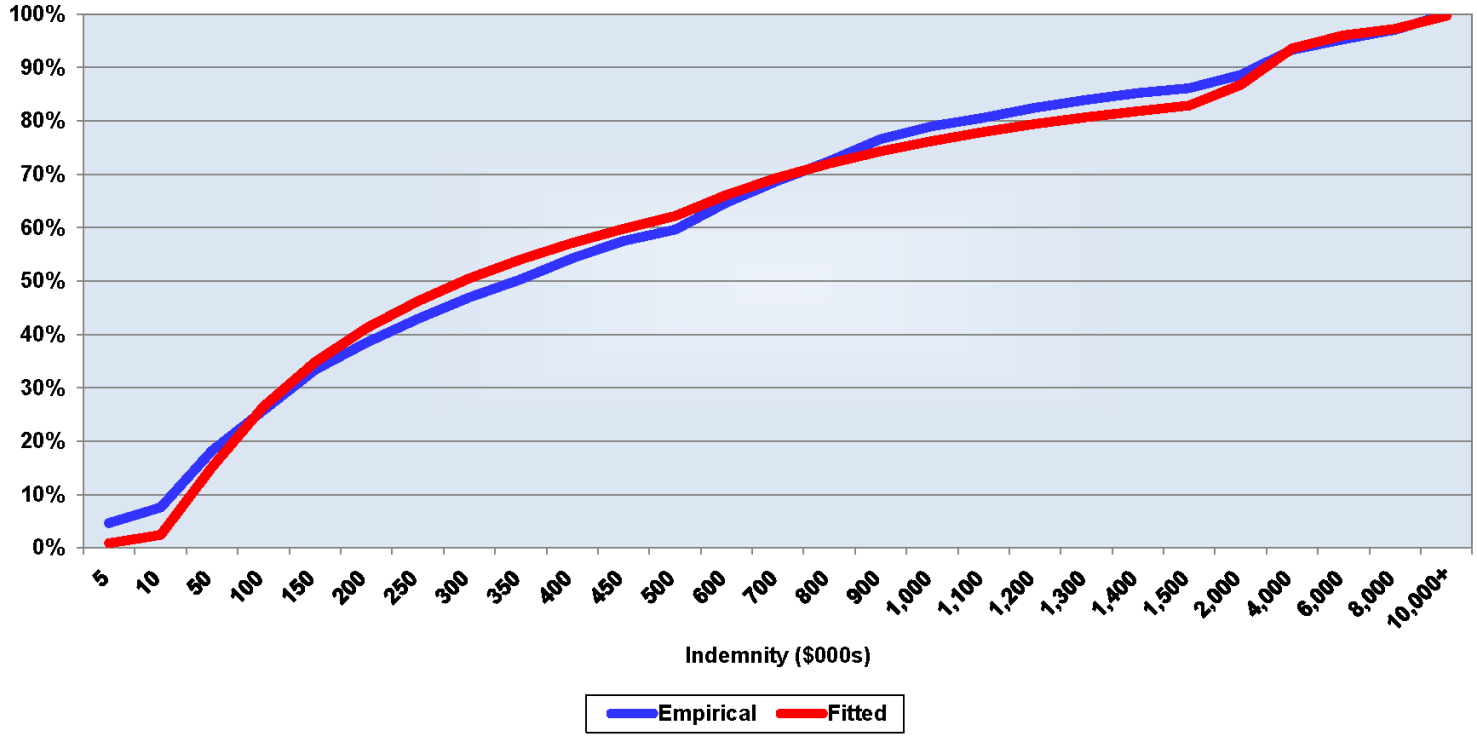
Exhibit E6. Selected CV for Maryland (Maryland Hospital Survey)

Based on all Closed With Indemnity Claims, Trended at 5.0% to July 1, 2025
Maryland Closed Claim Data 2010-2020
Cumulative Distribution Function

Loss Increment ($000's)	Cumulative Percent of Claims in Increment	Lognormal Distribution Under Given Coefficient of Variation							
		3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25
0-5	4.7%	0.5%	0.6%	0.7%	0.9%	1.0%	1.2%	1.4%	1.6%
5-10	7.6%	1.5%	1.8%	2.1%	2.5%	2.8%	3.1%	3.5%	3.8%
10-50	18.2%	12.0%	13.1%	14.1%	15.1%	16.1%	16.9%	17.7%	18.5%
50-100	25.8%	22.8%	24.2%	25.4%	26.5%	27.6%	28.5%	29.4%	30.2%
100-150	33.3%	31.1%	32.5%	33.7%	34.8%	35.8%	36.7%	37.6%	38.3%
150-200	38.4%	37.7%	39.0%	40.1%	41.2%	42.1%	43.0%	43.7%	44.5%
200-250	42.9%	43.0%	44.2%	45.3%	46.3%	47.1%	47.9%	48.6%	49.3%
250-300	46.9%	47.5%	48.6%	49.6%	50.5%	51.3%	52.0%	52.7%	53.3%
300-350	50.3%	51.3%	52.4%	53.3%	54.1%	54.8%	55.5%	56.1%	56.6%
350-400	54.3%	54.7%	55.6%	56.4%	57.2%	57.8%	58.4%	59.0%	59.5%
400-450	57.5%	57.5%	58.4%	59.2%	59.8%	60.4%	61.0%	61.5%	61.9%
450-500	59.7%	60.1%	60.9%	61.6%	62.2%	62.7%	63.2%	63.7%	64.1%
500-600	64.7%	64.4%	65.1%	65.6%	66.1%	66.6%	67.0%	67.4%	67.8%
600-700	68.8%	67.9%	68.5%	68.9%	69.4%	69.8%	70.1%	70.4%	70.7%
700-800	72.5%	70.8%	71.3%	71.7%	72.0%	72.4%	72.7%	72.9%	73.2%
800-900	76.6%	73.3%	73.7%	74.0%	74.3%	74.6%	74.8%	75.0%	75.2%
900-1,000	79.0%	75.4%	75.7%	76.0%	76.2%	76.5%	76.7%	76.9%	77.0%
1,000-1,100	80.6%	77.2%	77.5%	77.7%	77.9%	78.1%	78.3%	78.4%	78.6%
1,100-1,200	82.5%	78.8%	79.0%	79.2%	79.4%	79.5%	79.7%	79.8%	79.9%
1,200-1,300	84.0%	80.2%	80.4%	80.6%	80.7%	80.8%	80.9%	81.0%	81.1%
1,300-1,400	85.2%	81.5%	81.6%	81.7%	81.9%	82.0%	82.1%	82.1%	82.2%
1,400-1,500	86.2%	82.6%	82.7%	82.8%	82.9%	83.0%	83.0%	83.1%	83.2%
1,500-2,000	88.7%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%
2,000-4,000	93.3%	93.9%	93.8%	93.7%	93.6%	93.5%	93.4%	93.3%	93.3%
4,000-6,000	95.3%	96.4%	96.3%	96.2%	96.1%	96.0%	95.9%	95.8%	95.7%
6,000-8,000	97.1%	97.6%	97.5%	97.4%	97.3%	97.2%	97.1%	97.0%	97.0%
8,000+	100.0%	99.8%	99.8%	99.8%	99.7%	99.7%	99.7%	99.7%	99.6%
Based on Individual Data Points		Chi-Squared Statistic							
Total	100%	10009%	7091%	5247%	4049%	3261%	2744%	2414%	2215%
Total $150K to $700K	35%	35%	85%	154%	235%	323%	415%	509%	603%
Total $150K to $4M	60%	75%	119%	184%	262%	348%	439%	532%	625%
		Kolmogorov-Smirnov Statistic							
Total	100%	6.9%	6.4%	5.8%	5.3%	5.9%	6.5%	7.1%	7.6%
Total $150K to $700K	35%	2.7%	3.6%	4.5%	5.2%	5.9%	6.5%	7.1%	7.6%
Total $150K to $4M	60%	3.6%	3.6%	4.5%	5.2%	5.9%	6.5%	7.1%	7.6%
		Anderson-Darling Statistic							
Total	100%	39	32	28	25	24	24	25	27
Total $150K to $700K	35%	471	474	478	482	486	490	495	499
Total $150K to $4M	60%	3,554	3,584	3,615	3,645	3,674	3,703	3,730	3,757

Exhibit E7. Empirical and Fitted Cumulative Distribution Function for Maryland

Based on all Closed With Indemnity Claims, Trended at 5.0% to July 1, 2025
Maryland Closed Claim Data 2010-2020
Cumulative Distribution Function



Note: Reference Exhibit E6 for the data points underlying the chart.

Exhibit F1. Relationship Between ALAE and Non-Zero Indemnity – Selected Slope

Relationship Between ALAE and Non-Zero Indemnity

Database [1]	Years Used	Assumption	Claim Count	Slope	Intercept	R Squared	Indicated Correlation Coefficient	
							Pearson's R	Spearman's Rank Order
Maryland	2010-2020	Linear Relationship	2,055	0.061	83,537.341	0.228	0.478	0.597
Limited to $10M		Log-Linear Relationship	2,055	0.607	3.174	0.246	0.496	0.597
Maryland	2015-2020	Linear Relationship	1,096	0.078	83,784.566	0.260	0.510	0.621
Limited to $10M		Log-Linear Relationship	1,096	0.558	4.062	0.256	0.506	0.621
Maryland	2010-2020	Linear Relationship	2,055	0.027	115,648.036	0.308	0.555	0.597
Unlimited		Log-Linear Relationship	2,055	0.605	3.200	0.247	0.497	0.597
Maryland	2015-2020	Linear Relationship	1,096	0.027	134,109.852	0.333	0.577	0.621
Unlimited		Log-Linear Relationship	1,096	0.554	4.101	0.258	0.508	0.621
		Log-Linear Relationship		**0.600**				

[1] Indemnity and ALAE adjusted for inflation under the parameters selected on Exhibit D5, Exhibit D6 and Exhibit D7.

Exhibit F2. Relationship Between ALAE and Non-Zero Indemnity – Chart

Log-Linear Relationship Between Non-Zero Indemnity (Limited to $10,000,000 per Claim) and Non-Zero ALAE
Maryland Closed Claim Data 2010 - 2020

Note: Reference Loss to ALAE relationship file for the points underlying the chart.

Exhibit G1. Relationship Between Economic and Non-Economic Indemnity Severity

Relationship Between Economic and Non-Economic Indemnity Severity
Using the Texas Closed Claim Database[1]
$000s

Closed Year	Average Indemnity Payment[1] Economic	Average Indemnity Payment[1] Non-Economic	Severity Ratio, Economic to Non-Economic
2000	1,168,737	1,696,642	68.9%
2001	1,064,956	1,428,360	74.6%
2002	1,157,465	1,295,743	89.3%
2003	879,576	908,491	96.8%
2004	1,035,847	1,151,327	90.0%
2005	587,624	731,810	80.3%
2006	806,257	717,084	112.4%
2007	209,111	377,728	55.4%
2008	289,909	670,687	43.2%
2009	335,888	350,567	95.8%
2010	401,518	327,952	122.4%
2011	474,688	339,279	139.9%
2012	305,043	336,191	90.7%
All Years	788,286	961,138	82.0%
2005-2012	453,613	531,159	85.4%
2007-2012	335,157	411,904	81.4%
2009-2012	380,900	339,289	112.3%
		Selected	**85.0%**

[1] Includes only claims for which an amount was paid for the given loss type

Exhibit G2. Economic and Non-Economic Indemnity Claim Type Distribution

Economic and Non-Economic Indemnity Claim Type Distribution
Using the Texas Closed Claim Database

Closed Year	Economic Only	Non-Economic Only	Economic and Non-Economic
2000	5.2%	18.2%	76.6%
2001	3.2%	23.6%	73.2%
2002	3.0%	18.1%	78.9%
2003	3.3%	16.4%	80.3%
2004	1.7%	17.1%	81.2%
2005	2.4%	22.4%	75.2%
2006	0.5%	13.3%	86.2%
2007	0.8%	4.6%	94.6%
2008	1.8%	8.8%	89.5%
2009	0.6%	10.1%	89.2%
2010	0.8%	6.5%	92.7%
2011	0.0%	5.1%	94.9%
2012	1.6%	12.2%	86.2%
Total	2.4%	15.9%	81.8%
2000-2007	2.8%	18.0%	79.2%
2000-2005	3.1%	19.2%	77.7%
2000-2003	3.7%	19.0%	77.3%
Selected	**3.0%**	**19.0%**	**78.0%**

Exhibit G3. Relationship Between Non-Zero Economic Indemnity and Non-Zero Non-Economic Indemnity – Selected Relationship

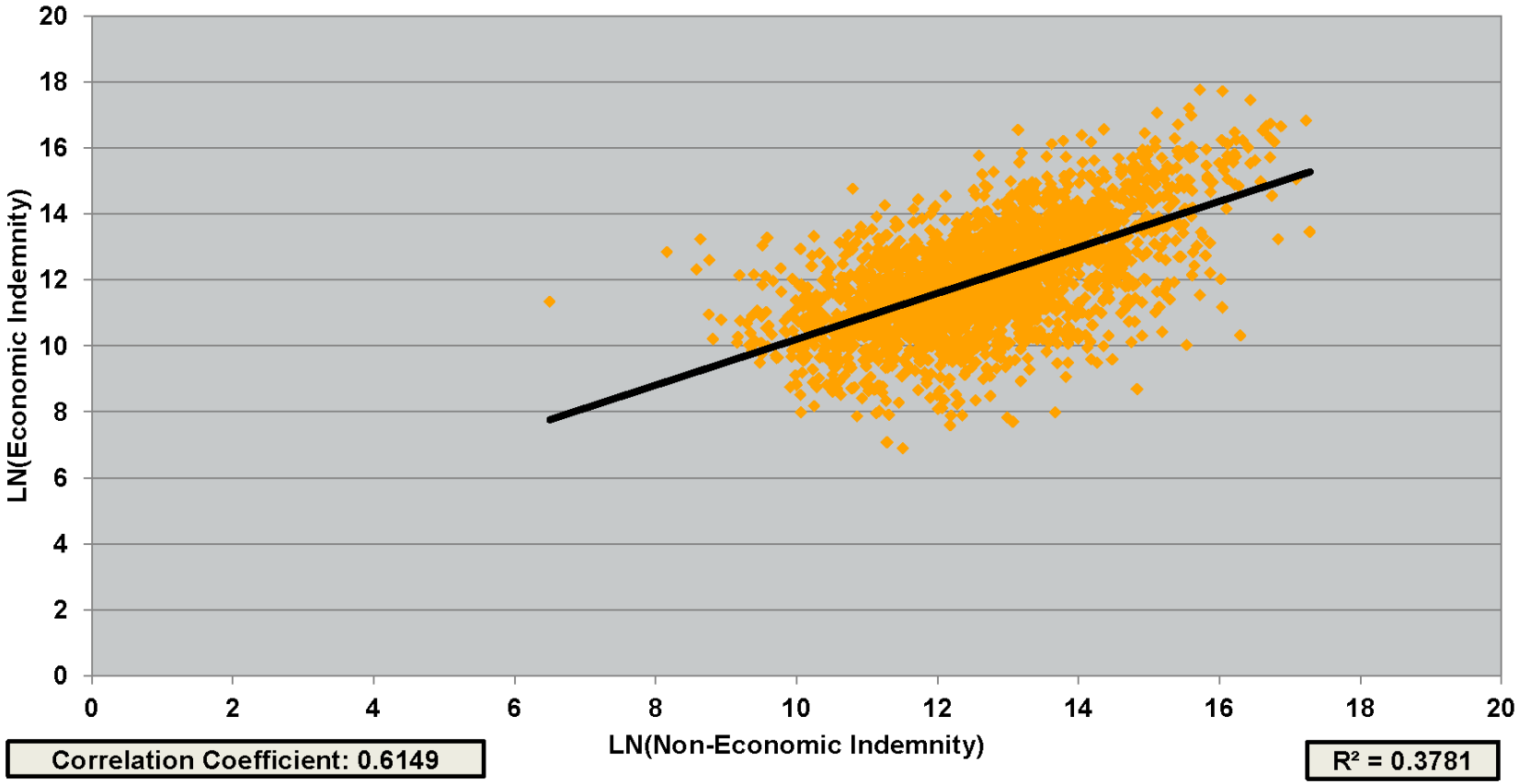
Relationship Between Non-Zero Economic Indemnity and Non-Zero Non-Economic Indemnity

Database [1]	Years Used	Assumption	R Squared	Indicated Correlation Coefficient: Pearson's R	Indicated Correlation Coefficient: Spearman's Rank Order
Texas	All	Linear Relationship	0.286	0.535	0.598
		Log-Linear Relationship	0.378	0.615	0.598
Texas	2000-2007	Linear Relationship	0.310	0.557	0.601
		Log-Linear Relationship	0.384	0.620	0.601
Texas	2000-2005	Linear Relationship	0.314	0.561	0.607
		Log-Linear Relationship	0.392	0.626	0.607
Texas	2000-2003	Linear Relationship	0.331	0.575	0.610
		Log-Linear Relationship	0.401	0.633	0.610
		Log-Linear Relationship			**0.600**

[1] Indemnity adjusted for inflation at 5.0% per annum to an average closed date of July 1, 2025.

Exhibit G4. Relationship Between Non-Zero Economic Indemnity and Non-Zero Non-Economic Indemnity – Chart

Log-Linear Relationship Between Non-Zero Economic Indemnity and Non-Zero Non-Economic Indemnity
Texas Closed Claim Data 2000 - 2012



Note: Reference Exhibit G3 for the data points underlying the chart.