

1. Consider Adoption of its March 11, Minutes

Attachment A

Commissioner Michael Humphreys (PA)



Draft: 3/21/25

Big Data and Artificial Intelligence (H) Working Group
Virtual Meeting
March 11, 2025

The Big Data and Artificial Intelligence (H) Working Group of the Innovation, Cybersecurity, and Technology (H) Committee met March 11, 2025. The following Working Group members participated: Michael Humphreys, Chair, and Shannen Logue (PA); Doug Ommen, Co-Vice Chair, Daniel Mathis, and Amanda Theisen (IA); Mary Block, Co-Vice Chair (VT); Alex Romero and Molly Nollette (AK); John Buono and Stacy Farris (AL); Tom Zuppan and Barbara D. Richardson (AZ); Ken Allen (CA); Jason Lapham (CO); Wanchin Chou (CT); Paul Walker (FL); Weston Trexler (ID); Jennifer Niles (IL); Jake Vermeulen (IN); Patrick Smith and Lori Cunningham (KY); Nathan Strebeck (LA); Caleb Huntington (MA); Marie Grant (MD); Sandra Darby (ME); Jeff Hayden (MI); Jacqueline Olson and Phil Vigliaturo (MN); Cynthia Amann (MO); Tracy Biehn (NC); Colton Schulz (ND); Connie Van Slyke (NE); Christian Citarella and Gregory Arce (NH); Gennady Stolyarov (NV); Adrienne A. Harris and Kevin Yan (NY); Matt Walsh (OH); Andreea Savu (SC); Travis Jordan (SD); Carter Lawrence and Emily Marsh (TN); J'ne Elizabeth Byckovski and Rachel Cloyd (TX); Michael Peterson (VA); Bryon Welch (WA); Timothy Cornelius and Lauren Van Buren (WI); Joylynn Fix (WV); and Lela D. Ladd (WY).

1. Adopted its 2024 Fall National Meeting Minutes

Block made a motion, seconded by Ladd, to adopt the Working Group's Nov. 17, 2024, minutes (*see NAIC Proceedings – Fall 2024, Innovation, Cybersecurity, and Technology (H) Committee, Attachment One*). The motion passed unanimously.

2. Received an Update on the Health AI/ML Survey

Logue thanked the insurance companies that responded to the health artificial intelligence (AI)/machine learning (ML) survey. She stated that the Working Group anticipates having a more detailed summary at the 2025 Spring National Meeting and that the full report should be available in April. She thanked consumer advocates for providing us with their areas of concern.

Logue provided an update on the follow-up private passenger auto (PPA) AI survey interviews. She stated that the Working Group met with a handful of companies with a national footprint and asked them about changes in their use of AI within their operations, how they are currently using AI, how they are engaging with third-party vendors, and the status of developing their governance practices. She then presented a summary of the responses with the caveat that it consisted of a small sample size, in which she noted that 64% had changed their use of AI in their operations. She said 56% of respondents changed their use of AI in marketing, 0% changed their use for underwriting, 28% changed their use in general operations, and 18% changed their use in telematics. Logue said that 91% of respondents advised that the *NAIC Model Bulletin on the Use of Artificial Intelligence Systems by Insurers* (AI Model Bulletin) was helpful, 91% conduct regular audits to measure and validate the performance of their models, and 82% measure outcomes for unfair discrimination. She said 50% of insurers were able to validate that their marketing models do not inadvertently exclude certain cohorts. Logue stated that 72% responded that they require vendors to demonstrate that they have tested their models prior to use, and 46% independently test vendor models. However, no companies responded that they use third-party data to test for unfair discrimination, data, and algorithmic outcomes.

Further, Logue stated that the company responses to the governance questions spanned the spectrum, from companies that had documented their framework well to companies whose governance was still conceptual.

Regarding compliance, several companies responded that they had fully inventoried their models and training data, but others had not. Some companies established criteria for ranking risk, but others were looking for guidance from regulators. Similarly, the responses to whether model drift and adverse outcomes were tested ranged from applying sophisticated methods to minimal testing, if any, with some companies looking for more guidance from regulators. Transparency disclosures and human-in-the-loop practices also varied greatly by company, along with assessing the risk of actual vendor-supplied AI systems.

Logue stated that emerging opportunities for regulators include: 1) establishing authority to hold third parties accountable or perhaps establish a national list of approved vendors that have been vetted; 2) providing guidance on transparency disclosures, allowing for consumer recourse; 3) providing uniform standards on governance practices; 4) providing guidance on governance, including how to test for adverse outcomes and standardized practices on allowable data elements and when human involvement is required to mitigate adverse impact to consumers; and 5) providing guidance on systems evaluations, including objective and specific questions consistent across lines of business and states, perhaps incorporating questions into annual statement filings, market conduct examinations, and/or financial examination reporting, and standardized questions based on model type.

Chou stated that regulators having authority over a regulated entity enhances consistency and improves efficiencies compared to waiting until an insurance company adopts a third-party model for subsequent review.

Earnest Collins (Regulatory Compliance and Examination [RCE] Consultants) asked what tools and automated processes are being used to help evaluate and regulate the different types of models and data processing. Logue replied that different companies use different tools, so there is not one solution out there to help with AI governance, how models are tested for drift, or how frequently models need to be tested. Collins followed up by asking what types of tools regulators will use to evaluate AI systems. Humphreys responded that discussing this topic is part of the Working Group's next steps.

Chou asked whether regulators have the right people and processes for proper review and recommended that regulators work with data scientists to help review models.

3. Reviewed its 2025 Charges, Including AI Systems Evaluation

Commissioner Humphreys stated that the NAIC adopted its Principles on AI and the AI Model Bulletin in 2023. The Working Group views the AI Model Bulletin as a reminder for insurers that existing laws, including consumer protections, apply. It explained regulator expectations of the responsible use of AI. Commissioner Humphreys stated that now is the time for the Working Group to provide additional recommendations, requirements, or guardrails to build on for the continued use of the AI regulation going forward.

Commissioner Ommen stated that the Working Group's charges include AI systems evaluation and gathering information about existing tools and resources available for regulating AI, assembling subject matter experts (SMEs) to develop new regulatory tools that many states are now using, and making this information readily available across the NAIC.

Peter Kochenburger (Southern University Law Center—SULC) clarified that this work effort is to essentially identify existing tools rather than develop specific consumer protections and does not seem to provide any new or additional protections for consumers than the last four years.

Commissioner Ommen clarified that this workstream does not have to do with developing model laws or changing the laws; it simply develops the regulatory tools in order to monitor and evaluate whether companies are

operating their business consistent with the AI Model Bulletin’s guidance. The purpose of this workstream is to bring together and share the tools being developed in the states in order to carry out those consumer protections.

Kochenburger commented that there is not another Innovation, Cybersecurity, and Technology (H) Committee group that is working on developing any new regulations, bulletins, model laws, or amending current laws to provide those rights, but it is heartening to hear that some states are looking to develop or have developed specific protections.

Birny Birnbaum (Center for Economic Justice—CEJ) noted three points. First, He said that in Logue’s overview, there were comments from the industry about asking regulators to provide oversight of third-party vendors. He questioned why they are not required to be licensed when they are performing the same activities as the companies that are already licensed as advisory organizations. Next, Birnbaum said the NAIC Principles on AI included a requirement for companies to take actions to avoid proxy discrimination, yet the AI Model Bulletin does not mention proxy discrimination. He questioned whether the NAIC anticipates implementing the NAIC Principles on AI in that regard. Lastly, he said that Logue’s overview stated that companies span across the spectrum in terms of governance. He asked whether there are numbers on that. He also asked how long regulators anticipate giving companies to comply with requirements that are already the law.

Commissioner Humphreys stated that the Third-Party Data and Models (H) Working Group is looking into the issues Birnbaum noted and that the Big Data and Artificial Intelligence (H) Working Group will have more opportunities for discussion at the Spring National Meeting.

4. Discussed Updates to the Regulatory Framework for the Use of AI Systems

Commissioner Humphreys said that regulators do not have a percentage of companies that have effective governance programs because of the small number of companies interviewed, but regulators want to build out a more continuous review process, whether through exams or analysis filings, as possibly the next step of discussions where regulators want feedback. In addition, regulators want future conversations and feedback on financial and market exam approaches and analyses that need to be done. Governance could consist of prohibited modeling practices, prohibited data elements, and disclosures both on the regulatory and the consumer side. California, Texas, and other states have either recently passed laws or have legislation pending that would provide additional regulation in the AI space. Humphreys urged state regulators to contribute feedback on the next steps to provide further clarity and guidance on disclosures to ensure consistency across the states.

Ladd asked if there has been any discussion on AI vocabulary definitions and gave an example of where the definition of “labor” in Wyoming was redefined as “services” in order to avoid depreciation.

Miguel Romero (NAIC) responded that the AI Model Bulletin includes several definitions to help clarify regulators’ intentions, but as part of the drafting process, it is anticipated there will be further discussions on definitions.

Birnbaum questioned whether the issue is not about definitions but rather about the use of AI to circumvent regulatory or statutory intent and suggested that an AI tool is needed for regulators to identify actions by insurance companies to subvert regulatory or statutory intent.

Commissioner Humphreys noted a question from Wayne Turner (National Health Law Program—NHLP) regarding whether the Working Group plans to conduct a second health AI/ML survey on non-major medical plans. Commissioner Humphreys said the Working Group will wrap up the first health study and then will look at how the landscape has changed. He said the Working Group will then regroup and determine what its next steps are.

Logue confirmed that the group will compile the report on the first health AI survey and then decide whether to continue the surveys.

Chou noted that he could help direct those interested in vendors providing AI tools that could help.

Eric Ellsworth (Checkbook Health) commented that he is looking forward to the AI strategy roadmap and clearer oversight of third parties. He also noted that data-sharing arrangements can cause implementation confusion. He gave the example that in prior authorization, there may be cases where there is a set of claims processing rules in the insurer's claims engine but a different set of rules in the prior authorization platform and wondered if this will be under review by the Working Group.

Commissioner Humphreys responded that those are the market conduct issues that the Working Group will be considering incorporating into an examination analysis.

5. Discussed a Preview of its Spring National Meeting Agenda

Commissioner Humphreys stated that the Working Group will be able to go into greater depth on the health AI/ML survey. He said the Working Group will be close to completing the report at the Spring National Meeting and will be able to talk through some of the results. Commissioner Humphreys said the Working Group will have a full discussion on how to narrow the next steps on the regulatory framework and build that out. He said the agenda will also include a brief presentation on the implications of missing data.

Having no further discussion, the Big Data and Artificial Intelligence (H) Working Group adjourned.

SharePoint/NAIC Support Staff Hub/Committees/H CMTE/2025_Spring/BDAIWG/2025-03-11 Interim Meeting/Minutes-BDAIWG031125.docx

2. Receive an Update on the Artificial Intelligence (AI) / Machine Learning (ML) Surveys and Recommendations

Attachment B

Commissioner Michael Humphreys (PA)

Shannen Logue (PA)



Purpose of the Health AI/ML Survey

- Understand the current status of AI/ML use by comprehensive major medical and student health insurers
- Gain insight into the role third parties play in the development and use of AI
- Gain an understanding of health insurers' AI governance frameworks
- Review alignment of health insurers' AI governance frameworks with NAIC AI Principles and Model Bulletin

Participating States (16)

Colorado (CO), Connecticut (CT),
Illinois (IL), Iowa (IA), Louisiana (LA),
Maryland (MD), Minnesota (MN),
Nebraska (NE), North Dakota (ND),
Oklahoma (OK), Oregon (OR),
Pennsylvania (PA), Vermont (VT),
Virginia (VA), West Virginia (WV),
and Wisconsin (WI)

Health Carrier Selection Criteria

Selected health insurance companies were subject to the following criteria:

- Written business in one or more of the participating 16 states
- Countrywide 2023 earned premiums of at least \$250,000,000
- Or
- Significant market share in one or more of the participating states

Product Lines Surveyed

Major Medical Plans

- Individual Comprehensive
- Small Group Comprehensive
- Large Group Comprehensive

Other Plans

- Student Health Plans

Functional Areas Surveyed

- Product Pricing and Plan Design
- Claims Adjudication
- Prior Authorization
- Utilization/Severity/Quality Management
- Fraud Detection
- Risk Management
- Risk Adjustment
- Data Processing
- Strategic Operations

AI/ML Adoption Status

- Does your company use AI/ML as defined in this survey? (78)
- Does your company plan to use AI/ML as defined in this survey? (3)
- Is your company currently exploring the use of AI/ML as defined in this survey? (5)
- No adoption of AI/ML (7)

AI Adoption Among the Four Lines of Insurance

Health Insurers

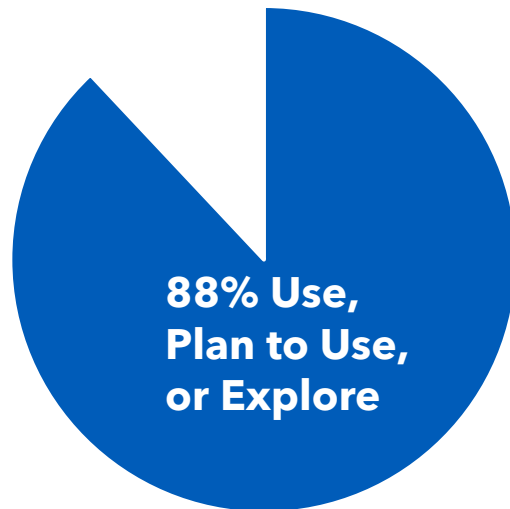
March 2025



93 Health Insurers Responded

Auto Insurers

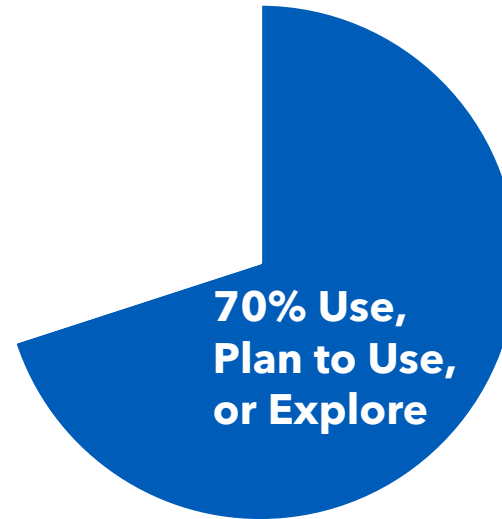
December 2022



193 Auto Insurers Responded

Home Insurers

August 2023



194 Home Insurers Responded

Life Insurers

December 2023



193 Life Insurers Responded

Nonuse of AI

Survey Question: Which reason best describes why you are not using Artificial Intelligence as described in this survey?

Responses

No compelling business reason at this time

Waiting for regulatory guidance

Lack of resources and expertise, reliable data

Legacy systems requiring data & technology upgrades

Waiting on third-party vendor product/service availability

Risk is not commensurate with current strategy or appetite

Reason other than the above

Implementation by Operational Area

Operational Area	In Production	0-1 Year	1-3 Years	3+ Years
Strategic Operations	79%	8	6	0
Utilization/Severity/Quality Mgmt	70%	10	6	2
Fraud Detection	70%	10	6	2
Sales & Marketing	70%	12	4	0
Claims Adjudication	62%	10	7	2
Data Processing	60%	9	12	2
Risk Adjustment	50%	10	17	2
Risk Management	41%	16	13	1
Product Pricing and Plan Design	37%	15	16	6
Prior Authorization	29%	16	25	3

Top 3 Machine Learning Techniques

Individual Major Medical

1. Ensemble
2. Large Language Model
3. Decision Trees

Student Health

1. Ensemble
2. Clustering
3. Rule System

Small Group Major Medical

1. Ensemble
2. Decision Trees, Dimensionality Reduction, Clustering
3. Large Language Models

Large Group Major Medical

1. Ensemble
2. Large Language Models, Decision Trees
3. Deep Learning

Third-Party Data Usage

Do you develop Artificial Intelligence (AI)/Machine Learning (ML) systems internally, use vendors, or both internally with input from vendors?

	Count	Percent %
N/A	5	6%
Develop Internally	8	10%
Develop by a Third-Party	12	15%
Develop Internally with a Third-Party	10	13%
Develop Internally with Third-Party Components	43	55%
Total	78	100%

AI/ML Model Testing

Survey Question	Yes
Does your company...	
▪ Document accuracy of AI/ML model outcomes?	82%
▪ Document reliability of AI/ML model outcomes?	80%
▪ Test for model drift?	76%
▪ Test for bias in algorithmic outcomes?	75%
▪ Test for bias in modeling data?	70%
▪ Conduct audits on its AI/ML models?	70%
▪ Document unfair discrimination on its AI/ML models?	63%
▪ Apply statistical methods to infer protected class characteristics?	38%

Governance

Disclosures Survey Questions	Yes
Do you have AI/ML Governance Principles in place that model the NAIC AI Principles?	92%
Do you have a process for applicants for health insurance to contest an adverse underwriting decision?	29%
Do you keep a log of the number of contested underwriting decisions?	23%
Do you disclose to providers, or physicians how and when AI/ML is used by the insurer or a third-party vendor?	23%

Complete Automation–Human Aided AI/ML	Yes
Extent of AI Automated Decision Making < 50%	98%
Extent of AI Augmentation Decision Making < 50%	85%
Extent of AI Supporting Decision Making < 50%	70%

Health Report
Publication Tentative
Date: **April 2025**

Questions



3. Receive an Update on the Regulatory Framework for the Use of AI Systems

Attachment C

Commissioner Michael Humphreys (PA)

Commissioner Doug Ommen (IA)



AI Systems Regulatory Framework Roadmap

STEP 1: Define Principles and Assess Insurer's AI Use

2020

- ✓ Principles of AI

2021 - 2025

Survey Insurers

- ✓ Private Passenger Auto
- ✓ Homeowners
- ✓ Life Insurance
- ✓ Health Insurance
- ✓ Follow Ups

STEP 2: Develop AI Risk Evaluation Tools

2023

- ✓ AI Model Bulletin

2025

Develop Evaluation Tools

To Identify Risks:

- Market Exams
- Financial Exams
- MCAS Data
- Self-Assessment
- Evaluation Metrics

STEP 3: Regulatory Oversight and Accountability

2025

In Coordination with
Other Committees and
Working Groups...

Refine AI Expectations:

- AI Governance
- AI Transparency
- Adverse Outcomes
Accountability
- Prohibited Practices

STEP 4: Identify and Address Gaps in AI Evaluation

2026+

In Coordination with
Other Committees and
Working Groups...

- Identify New AI Risks
or Issues
- Develop Solutions to
Address New Risks

Encourage Innovation By Ensuring AI Systems are Fair, Secure, Safe, and Robust

STEP 2: Develop AI Risk Evaluation Tools

AI Systems Evaluation: Several states already exploring AI evaluations, working under the BDAIWG started discussions last year exploring how states are assessing market and financial risk associated with an insurance company's use of AI

Goals:

- Provide regulators with an efficient, standardized data collection tool(s) to use in an investigation or examination that helps identify and assess financial and market risk associated with AI use.
- Provide insurance companies with guidance and/or tool(s) that align with regulator expectations on AI use to ensure development, implementation, and monitoring follow safe and fair practices.

Tasks for 2025:

- Develop new regulatory tool(s), guidance, and identify if additional MCAS data is needed
- Coordinate the development of review and enforcement tools, resources, guidelines, and training
- Create a self-audit questionnaire for insurers that aligns to regulator evaluation tools and guidance

STEP 3: Regulatory Oversight and Accountability

Governance

Best Practices, Guidance, Templates

AI Testing

Model Training

Drift Detection

Identifying Adverse Consumer Outcomes

Risk Classification

Transparency

AI Use Disclosure

Data Use Disclosure

Degree of Human In the Loop Disclosure

Basis, Source of Data, Reason for Decision

Provide Recourse to Appeal and/or Fix Inaccurate Data

AI Complaint Tracking

Accountability

Clarify Accountability When Using Third Party Data/Models

Adverse Consumer Outcome Reporting to Consumers and Regulators

Identify AI Use Cases that Require Human in the Loop (Prohibited Uses)

Holistic Approach - Collaboration Across Committees and Working Groups

QUESTIONS & NEXT STEPS





4. Hear a Presentation on How Missing Data is Treated and Implications in Ratemaking

Attachment D

Kevin Burke (NAIC)

MISSING DATA

Age	Deame	Opfc	Sevntary	Age	Rowe	Oncisat	ScerfLocos	Inome	tamive	Dicive	Roccl
G2e	Desmooiis			OradKell		Oratiao BFP1	AU#trvifit:	OvaireB0 2130	@of150,183	(alagM	254910)
										MISSING	
								MISSING			
				MISSING							
	MISSING			MISSING							
		MISSING							MISSING		
		MISSING			MISSING						
									MISSING		
					MISSING						

Missing Data Analysis: An (Abbreviated) Actuarial Perspective

Kevin Burke, PhD, ARe, AU, CPCU, FCAS, MAAA
P/C Modeling Actuary and Data Scientist
National Association of Insurance Commissioners

Missing Data in Clinical Studies

Missing data can arise for many reasons:

- Respondent refuses to provide household income
- Machinery breaks down in an industrial experiment
- Patient misses an appointment to get blood drawn

Statistical methods have been developed to incorporate missing data into analyses, but the history is much shorter in actuarial analyses and methods are less sophisticated.

Missing Data in Actuarial Analyses

With the advent of Generalized Linear Models (GLM) and credit-based insurance scores in the early 2000's, actuaries encountered missing values.

Score		Description
998	Thin Hit	Consumer does not have enough information to determine a score.
999	No Hit	Consumer is not in credit database.

Modelers responded by binning insurance score and creating separate factor levels in the GLM's.

Missing Data in Actuarial Analyses

Consumer representatives responded by pointing out that

- younger consumers are more likely to have thin hits
- older consumers are more likely to not use credit
- some consumers have religious beliefs that discourage the use of credit
- credit is unavailable in some regions

These categories were often rated as neutral (factor of 1.00) or rated as the average of modeled factors.


Missing Data in Actuarial Analyses

As the use of third-party data has grown, so has the appearance of missing data in modeling data.

Policyholder	Insurer Data
A	X1
B	X2
C	X3

Policyholder	Third-Party Data
A	Y1
B	Y2

Policyholder	Insurer Data	Third-Party Data
A	X1	Y1
B	X2	Y2
C	X3	NA



Using this data is a modeling decision that introduces uncertainty into the modeling process.

Is “Missing” or “Unknown” an Appropriate Risk Class?

ASOP 12 – Risk Classification (for All Practice Areas)

What is a Risk Characteristic?

Measurable or observable factors or characteristics that are used to assign each risk to one of the risk classes of a risk classification system.

Risk
Characteristic



Roof Condition

Excellent

Good

Fair

Poor

Missing

Is the class “Missing”

- Objective?
- Practical?



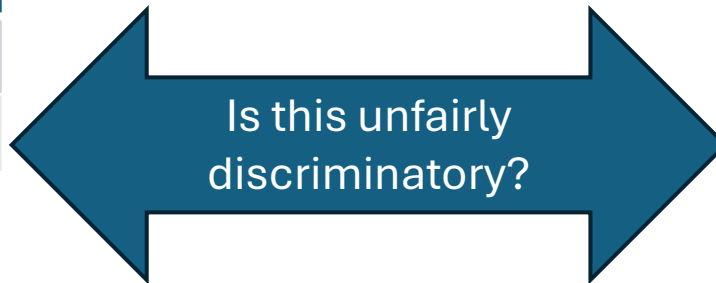
Risk Classes

A set of risks grouped together under a risk classification system.

Unbiased Estimates Determine Rate Relativities

Models use data to make inferences about populations.

Territory	Relativity
Urban	1.00
Rural	0.90



Territory	Relativity
Urban	1.00
Rural	0.95
Missing	0.90

All other things being equal, rural should pay 10% less than rural.

Including “Missing” in your model,

- Changes relationships
- There is no one in the population with a “Missing” Territory.

Questions to Ask About Missing Data

- What is the amount of missing data?
- What are the reasons for the missing data? (Can the policyholder provide the missing information?)
- What method(s) did you use to account for the missing data (e.g. complete-case analysis, multiple imputation)?
- What assumptions were made (e.g. missing at random)?
- Do multiple imputation and complete-case analysis lead to similar conclusions? If not, why?

Van Buuren (pages 343-44)

Main Points

- Using missing data in a model will lead to statistically biased estimates unless the missing data is random
- The use of missing as a risk class appears to conflict with ASOP 12: Risk Classification (for All Practice Areas)
- Ad hoc approaches lead to statistically biased models
- There are more sophisticated approaches to modeling with missing data

Questions or Comments?



References

- Van Buuren, S. (2018). *Flexible Imputation of Missing Data 2nd edition*. CRC Press, Boca Raton, FL.
- Enders, C. (2022). *Applied Missing Data Analysis 2nd edition*. Guilford Press, New York, NY.
- Little, R. and Rubin, D (2002). *Statistical Analysis with Missing Data 2nd edition*. John Wiley and Sons, Hoboken, NJ.
- Goldburd, M. et al (2020). *Generalized Linear Models for Insurance Rating 2nd edition*. Casualty Actuarial Society.
- Hastie, T. et al (2009). *The Elements of Statistical Learning: Data Mining, Inference, and Prediction 2nd Edition*. Springer, New York.