

A background image of a pair of scales of justice, rendered in a dark blue, semi-transparent style. The scales are centered and occupy most of the frame. On the left side, there is a vertical orange ribbon-like graphic element.

**CAS RESEARCH PAPER
SERIES ON RACE AND INSURANCE PRICING**

REGULATORY PERSPECTIVES ON ALGORITHMIC BIAS AND UNFAIR DISCRIMINATION

*Lauren Cavanaugh, FCAS, MAAA; Scott Merkord,
FCAS, MAAA; Taylor Davis, FCAS, MAAA; and
David Heppen, FCAS, MAAA*

CASUALTY ACTUARIAL SOCIETY



The CAS Research Paper Series on Race & Insurance Pricing was created to guide the insurance industry toward proactive, quantitative solutions that address potential racial bias in insurance pricing. These reports explore different aspects of unintentional potential bias in insurance pricing, address historical foundations and offer forward-looking solutions to quantify and handle possible bias. Through these reports, the CAS aims to encourage actuaries to discuss this topic with their stakeholders across all areas of insurance pricing and operations. For more information on the series, visit casact.org/raceandinsuranceresearch.

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Casualty Actuarial Society
4350 North Fairfax Drive, Suite 250
Arlington, VA 22203
www.casact.org
(703) 276-3100

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Scope

Risk & Regulatory Consulting, LLC (“us,” “we,” “our”), was retained by the Casualty Actuarial Society (CAS) to perform research related to regulation on algorithmic bias. This report is issued to document our work related to this engagement. The report contains a summary of current and proposed legislation and regulation, a summary of the results of our survey on regulator viewpoints, considerations for actuaries, and our conclusions.

The remainder of our report is laid out as follows:

- **Definitions:** Provides definitions of terms used in the report
- **Executive Summary:** Summarizes our research and findings
- **Current and Proposed Legislation and Regulation:** Summarizes current and proposed legislation and regulation as of May 1, 2024
- **Survey on Regulator Views:** Provides a synopsis of survey results to share various regulatory views on addressing algorithmic bias
- **Considerations for Actuaries:** Discusses practical considerations and recommendations for actuaries who must comply with regulatory and legislative requirements related to algorithmic bias
- **Conclusion:** Discusses unanswered questions and actuaries’ involvement in addressing algorithmic bias going forward
- **Appendix 1:** Survey provided to regulators
- **Appendix 2:** Actuarial standards related to legislation and regulation
- **Appendix 3:** Relevant existing model laws
- **Appendix 4:** Summarizes New York Department of Financial Services Insurance Circular Letter No. 7

We – Lauren Cavanaugh, Scott Merkord, Taylor Davis, and David Heppen – are Fellows of the CAS and members of the American Academy of Actuaries (AAA). We meet the qualification standards of the AAA to render the actuarial opinions contained herein. We have attested compliance with the CAS Continuing Education Policy as of December 31, 2023, to perform actuarial services in 2024.

Definitions

The terms below are defined for use in this report. The same definitions were provided to regulators who completed the survey discussed in this report.

- *Artificial intelligence (AI)* refers to a branch of computer science that uses data processing systems that perform functions normally associated with human intelligence, such as reasoning, learning, and self-improvement, or the capability of a device to perform functions that are normally associated with human intelligence such as reasoning, learning, and self-improvement. This definition considers machine learning to be a subset of AI (NAIC 2023b).
- *Predictive model* refers to the mining of historical data using algorithms and/or machine learning to identify patterns and predict outcomes that can be used to make or support the making of decisions (NAIC 2023b).
- *Machine learning* refers to a field within AI that focuses on the ability of computers to learn from provided data without being explicitly programmed.
- *Unfair discrimination, unfair trade practices, and unfair claim settlement practices* should be interpreted in accordance with applicable state laws.

We recognize that there are different definitions and understandings of the term *algorithmic bias*. For this report, we used a broad definition of algorithmic bias that includes systemic, human, and statistical biases. These categories of bias are described in a paper (Schwartz et al. 2022) published by the National Institute of Standards and Technology (NIST). The NIST paper discusses those categories further:

- **Systemic bias** – Systemic biases result from procedures and practices of particular institutions that operate in ways which result in certain social groups being advantaged or favored and others being disadvantaged or devalued. This need not be the result of any conscious prejudice or discrimination but rather of the majority following existing rules or norms.
- **Human bias** – Human biases reflect systematic errors in human thought based on a limited number of heuristic principles and predicting values to simpler judgmental operations. These biases are often implicit and tend to relate to how an individual or group perceives information (such as automated AI output) to make a decision or fill in missing or unknown information.
- **Statistical bias** – Statistical and computational biases stem from errors that result when the sample is not representative of the population.

Regulatory Perspectives on Algorithmic Bias and Unfair Discrimination

By Lauren Cavanaugh, FCAS, MAAA; Scott Merkord, FCAS, MAAA; Taylor Davis, FCAS, MAAA; and David Heppen, FCAS, MAAA

Executive Summary

There has been considerable regulatory and legislative activity regarding the use of artificial intelligence (AI) and models in property and casualty insurance practices over the past few years, and much of it has focused on concepts related to algorithmic bias, typically in the context of impacts on racial and ethnic minorities in the United States. This activity to date has focused on regulation of insurers' models to ensure that they are adhering to existing statutes through appropriate model governance. There is also legislation and regulation related to the use of third-party AI systems and external data in underwriting and to disproportionate impact on certain groups.

Given all this activity, our research focused on gaining an understanding of regulators' views on the following:

- Their level of concern regarding the presence of unfair discrimination due to algorithmic bias
- Their level of concern regarding the availability and affordability of insurance due to algorithmic bias
- Expectations for insurers to ensure adherence to existing statutes
- Testing methodologies that insurers should use to identify algorithmic bias
- Inference techniques used in testing for algorithmic bias
- Current legislation/regulation under consideration in their jurisdiction
- Which private passenger automobile (PPA) rating elements are most concerning
- Recommendations for actuaries who need to respond to regulatory and legislative requirements

We constructed a survey that contained multiple-choice and short-answer questions and then sent it to the insurance commissioner and one deputy commissioner in all 50 states. We received 10 responses and followed up with each individual to obtain additional clarity on their responses. We believe that responses from 10 of 50 regulators provide a cross-section of national regulatory views, given that regulators collaborate regularly via various

National Association of Insurance Commissioners (NAIC) committees and in other forums and that many of the respondents have been active participants in these discussions.

As expected, respondents demonstrated a diversity of opinions. Key takeaways are as follows:

- Respondents have concerns regarding the presence of unfair discrimination, unfair trade practices, or unfair claim settlement practices due to algorithmic bias.
- Many regulators are taking a collaborative approach to addressing algorithmic bias through NAIC meetings and working groups. Few regulators identified state-specific activities (such as research or drafting guidance) that were not connected to national-level initiatives. That said, some states are engaged in specific initiatives, as summarized in Section 1.
- Many respondents referenced the NAIC Model Bulletin: Use of Artificial Intelligence Systems by Insurers (“Model Bulletin on AI”) (NAIC 2023b) and expect insurers to implement proper model governance and documentation of models.
- Most respondents agree that multiple testing methodologies should be used to identify algorithmic bias – including using statistical fairness tests, reviewing the impacts of the models, implementing proper model governance, providing a rational explanation for data used, and testing to ensure that models do not use data and information that act as proxies for protected classes.
- Respondents have mixed opinions on whether race (whether collected or inferred) should be used to test for algorithmic bias, and three disagree with the use of Bayesian Improved First Name Surname Geocoding (BIFSG)¹ as a technique to infer race. When asked for additional explanation, one respondent stated that the BIFSG technique has a high error rate and they would not recommend it. Further, one respondent believes it would be helpful for carriers to ask consumers to voluntarily share their race for bias testing.
- Apart from adopting the NAIC Model Bulletin on AI, few respondents have regulation or legislation currently under review or adopted related to addressing algorithmic bias.
- Regarding PPA rating elements, most respondents are concerned about the use of homeownership, occupation, credit-based insurance score, and criminal history (unless related to driving). Most regulators are not concerned about the use of age, motor vehicle records, or

¹ See Weeden, Algorex Health, and Naunheim (2020) and Fremont et al. (2016).

marital status. Regulators have mixed views on the use of geographic location variables, gender, and education status.

- Most respondents do not believe that evaluating rates for actuarial soundness alone satisfies their concerns surrounding unfair discrimination. They suggest that actuaries take the following steps:
 - Consider whether they may have inadvertently used data that may have supported biased results in the past
 - Consider algorithmic bias concerns as part of the cost-benefit analysis when determining which rating variables to include in a class plan
 - Provide a robust description of data used, an explanation of the modeling process and what controls are in place to assess bias, and a quantitative measure of predictive value for each variable included
 - Work with the regulators to understand the process they are implementing and the reason they are looking into algorithmic bias
 - Review models annually, if not more frequently, to ensure that they are still working as they are supposed to

Given the regulators' responses, we recommend the following considerations for actuaries who are involved in addressing algorithmic bias related to regulatory and legislative requirements going forward:

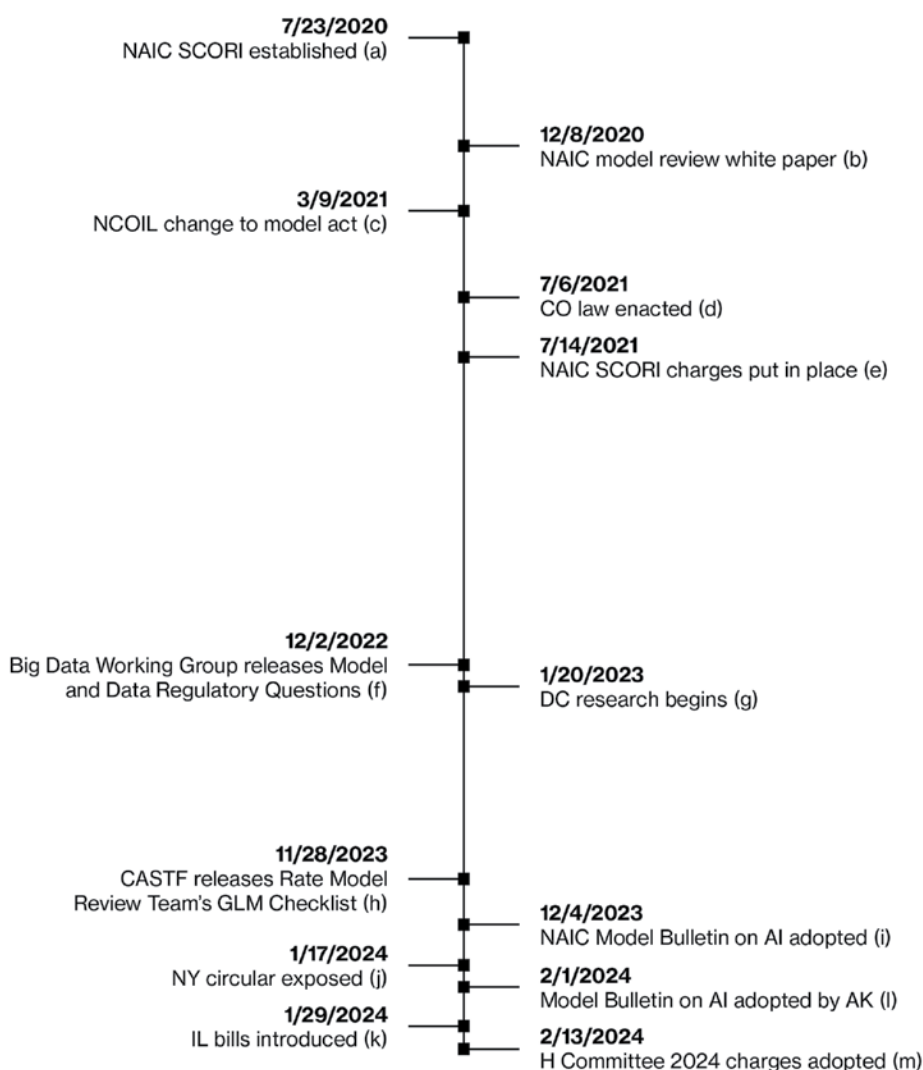
- Design and document appropriate testing to address algorithmic bias.
- Embed considerations of algorithmic bias throughout modeling.
- Assess the current model governance framework and identify areas that could be improved.
- Engage with regulators regarding the use of AI and models.
- Consider applicable Actuarial Standards of Practice (ASOPs), including the following:
 - ASOP 12, Risk Classification (Actuarial Standards Board 2011)
 - ASOP 23, Data Quality (Actuarial Standards Board 2016)
 - ASOP 41, Actuarial Communications (Actuarial Standards Board 2010)
 - ASOP 56, Modeling (Actuarial Standards Board 2019)

1. Current and Proposed Legislation and Regulation

There has been considerable regulatory and legislative activity regarding the use of artificial intelligence (AI) and models in property and casualty (P&C) insurance practices over the past few years, and much of this activity has focused on concepts related to algorithmic bias. It is important for actuaries to consider these changes, especially in light of Actuarial Standards of Practice (ASOPs), which include many references to adhering to regulatory and legal requirements. We summarize these considerations in Appendix 2.

Some notable recent regulatory and legislative is indicated in Figure 1.

Figure 1. Regulatory and Legislative Activity Timeline



Sources: ^a NAIC (2020b); ^b NAIC (2020a); ^c NCOIL (2021); ^d Colorado DORA (2021); ^e NAIC (2021); ^f NAIC (2022); ^g District of Columbia DISB (2022a); ^h NAIC (2023a); ⁱ NAIC (2023b); ^j NYDFS (2024a); ^k Illinois H.B. 4611 (introduced January 29, 2024), status: <https://legiscan.com/IL/bill/HB4611/2023>; ^l Alaska DCCED Division of Insurance (2024); ^m NAIC (2024c).

Note: NAIC = National Association of Insurance Commissioners; SCORI = Special Committee on Race and Insurance; NCOIL = National Council of Insurance Legislators; CASTF = Casualty Actuarial and Statistical Task Force; GLM = Generalized Linear Model.

This activity to date has focused on regulation of insurers' models to ensure that they are adhering to existing statutes through appropriate model governance. There is also legislation and regulation related to the use of third-party AI systems and external data in underwriting and to disproportionate impact on certain groups.

A selection of this activity is summarized below, in chronological order. Further, there are model acts that, while not specific to algorithmic bias, are important to consider (and are highlighted in the National Association of Insurance Commissioners [NAIC] Model Bulletin on AI discussed below). These model acts include the Unfair Trade Practices Model Act, Unfair Claims Settlement Practices Model Act, Corporate Governance Annual Disclosure Model Act, Property and Casualty Model Rating Law, and Market Conduct Surveillance Model Law. We summarize these model laws in Appendix 3.

NAIC Model Review

White Paper

The NAIC issued a white paper on regulatory review of predictive models (NAIC 2020a), which was adopted by the Casualty Actuarial and Statistical Task Force on September 15, 2020, and the Property and Casualty Insurance Committee on December 8, 2020.

There are benefits to both consumers and insurers when insurers responsibly use predictive analytics along with big data. Predictive analytics can reveal insights into the relationship between consumer behavior and the cost of insurance, which can lower the cost of insurance and provide incentives for consumers to better control and mitigate loss.

The review of predictive models is an art that can be made more efficient with best practices. State insurance regulators review models to determine whether modeled rates are compliant with existing state laws and/or regulations. The NAIC document provides best practices for regulators related to predictive model review, including the following general items, with tasks accompanying each one:

1. Ensure that the selected rating factors, based on the model or other analysis, produce rates that are not excessive, inadequate, or unfairly discriminatory.
2. Obtain a clear understanding of the data used to build and validate the model, and thoroughly review all aspects of the model, including assumptions, adjustments, variables, submodels used as input, and resulting output.
3. Evaluate how the model interacts with and improves the rating plan.
4. Enable competition and innovation to promote the growth, financial stability, and efficiency of the insurance marketplace.

Model and Data Regulatory Questions

The Model and Data Regulatory Questions document (NAIC 2022) was produced in December 2022 by the Big Data and AI Working Group as a part of the NAIC H Committee. The document includes questions that regulators can ask about models and data used

by insurance companies. Both internal and external data and models are addressed. Key guidance related to bias and unfair discrimination includes the following:

1. Within the “Governance of Third-Party Models” section, carriers are instructed to “identify the scope and process for validity testing. Describe procedures designed to reduce the risk of inaccurate or biased data.”
2. Under “Fairness and Ethics Considerations,” the guidance recommends, “Generally, respect the rule of law and implement trustworthy solutions designed to benefit consumers in a manner that avoids harmful or unintended consequences including unfair or proxy discrimination.”
3. Under “Appropriate Resources and Knowledge Involved to Ensure Compliance with Laws Including Those Related to Unfair Discrimination,” the document calls for “ensuring the requisite and appropriate resources, skillsets and knowledge needed to ensure compliance with laws, including those related to unfair discrimination, are actively involved in these programs and decision-making – including oversight of third parties’ understanding and competence related to compliance with relevant laws and the issue of unfair discrimination.”

Rate Model Review Team’s GLM Checklist

The NAIC’s Casualty Actuarial and Statistical Task Force issued the Rate Model Review Team’s GLM [Generalized Linear Model] Checklist in November 2023 (NAIC 2023a).

The goal of the document is to make the review process more efficient. Model introduction, data, modeling, validation, and implementation are the topics addressed in the checklist. In the “Data” section, the checklist includes an item referencing “a description of steps taken to meet state requirements regarding unfair discrimination (if applicable).”

NAIC Special Committee on Race and Insurance

The NAIC has established a Special Committee on Race and Insurance (SCORI) as part of its Executive Committee.

SCORI’s charges include the following (NAIC 2024d):

Serve as the NAIC’s coordinating body on identifying issues related to (1) race, diversity, and inclusion within the insurance sector; (2) race, diversity, and inclusion in access to the insurance sector and insurance products; and (3) practices within the insurance sector that potentially disadvantage people of color and/or historically underrepresented groups.

Coordinate with existing groups such as the Innovation, Cybersecurity, and Technology (H) Committee; the Big Data and Artificial Intelligence (H) Working Group; and the Casualty Actuarial and Statistical (C) Task Force and encourage those groups to continue their work on issues affecting people of color and/or historically underrepresented groups, particularly in predictive modeling, price algorithms, and AI.

SCORI has numerous additional charges related to research and coordination with other committees within the NAIC.

The Property/Casualty Workstream's charges include developing analytical and regulatory tools to assist state insurance regulators in defining, identifying, and addressing unfair discrimination in P&C insurance, including issues related to the following:

- Rating and underwriting variables, such as socioeconomic variables and criminal history, including consideration of the following issues:
 - Identifying proxy variables for race
 - Correlation versus causation, including discussion of spurious correlation and rational explanation
 - Potential bias in underlying data
 - Proper use of third-party data
- Disparate impact considerations

Colorado Senate Bill 21-169

Colorado Senate Bill 21-169,² signed into law in July 2021, protects consumers from unfair discrimination in insurance practices. The bill was designed to safeguard Colorado consumers against unfair discrimination in insurance practices based on race, color, national or ethnic origin, religion, sex, sexual orientation, disability, gender identity, or gender expression. The law holds insurers responsible for testing their big data systems, including algorithms and predictive models, to ensure that they do not discriminate unfairly against consumers. Insurers are required to take corrective action if any consumer harm is discovered as a result of these systems.

The law directs the insurance commissioner to collaborate with stakeholders before adopting rules on how companies should test and demonstrate that their use of big data does not result in unfair discrimination. This legislation is applicable to life, health, and P&C policies. The Colorado Division of Insurance has held numerous stakeholder meetings in order to provide information and solicit feedback from stakeholders regarding the implementation of this law (Colorado DORA 2021).

District of Columbia DISB (Active Research)

In 2020, Commissioner Karima Woods of the District of Columbia Department of Insurance, Securities and Banking (DISB) directed the creation of the department's first Diversity, Equity and Inclusion Committee to engage in a wide-ranging review of

² Concerning Protecting Consumers from Unfair Discrimination in Insurance Practices, S.B. 21-169 (2021), https://leg.colorado.gov/sites/default/files/2021a_169_signed.pdf.

financial equity and inclusion and to make recommendations to remove barriers to accessing financial services, including an initiative related to insurers' use of factors such as credit scores, education, occupation, home ownership, and marital status in underwriting and ratemaking.

As a follow-up to this review, DISB is conducting a review of auto insurers' rating and underwriting methodologies to analyze the potential for unintentional bias in private passenger automobile (PPA) insurance (District of Columbia DISB 2022a).

DISB wants to explore whether the use of certain information by auto insurers in the application and underwriting process may cause harm to Black people, Indigenous people, people of color, and other protected classes of Washington, D.C., consumers. Criteria being reviewed include but are not limited to credit scores, education, home ownership, occupation, and marital status.

DISB will investigate these concerns by conducting a review of recent applications for auto insurance within Washington, D.C. and will prepare a report of its findings that will be available to the public. DISB will propose legislative changes to address insurers' use of certain factors in their underwriting and rating practices if it is determined that such factors have led to unintentional bias.

DISB has held multiple hearings to obtain feedback from stakeholders (District of Columbia DISB 2018, 2019, 2022b).

NAIC H Committee

The mission of the NAIC Innovation, Cybersecurity, and Technology (H) Committee includes the following tenets (NAIC 2024b):

- Provide a forum for state insurance regulators to learn about and have discussions regarding cybersecurity, innovation, data security and privacy protections, and emerging technology issues
- Monitor developments in these areas that affect the state insurance regulatory framework
- Maintain an understanding of evolving practices and use of innovation technologies by insurers and producers in respective lines of business
- Coordinate NAIC efforts regarding innovation, cybersecurity and privacy, and technology across other committees
- Make recommendations and develop regulatory, statutory, or guidance updates, as appropriate

Two teams relevant to this study are the Third-Party Data and Models (H) Task Force and the Big Data and Artificial Intelligence (H) Working Group.

The Third-Party Data and Models (H) Task Force, which currently has a work plan exposed for comment, is a new task force that adopted the following charges (NAIC 2024e):

- Develop and propose a framework for the regulatory oversight of third-party data and predictive models
- Monitor and report on state, federal, and international activities related to governmental oversight and regulation of third-party data and model vendors and their products and services

The Big Data and Artificial Intelligence (H) Working Group oversees the completion of the work of the Collaboration Forum on Algorithmic Bias. Its responsibilities include the following (NAIC 2024a):

- Monitor and support adoption of the NAIC Model Bulletin: Use of Artificial Intelligence Systems by Insurers
- Explore the creation of an independent synthetic data set to support testing of predictive models for unfair discrimination, in collaboration with the Center for Insurance Policy and Research, as appropriate
- Finalize and maintain a glossary/lexicon to guide regulators as they engage in AI- and technology-related discussions

NAIC Model Bulletin: Use of Artificial Intelligence Systems by Insurers

The NAIC Executive Committee and Plenary adopted the NAIC Model Bulletin: Use of Artificial Intelligence Systems by Insurers on December 4, 2023 (NAIC 2023b). While some states had issued state-specific bulletins regarding the use of complex models and big data prior to 2023,³ the NAIC identified and acted on a need to coordinate across states and produce a model bulletin to “remind all Insurers that hold certificates of authority to do business in the state that decisions or actions impacting consumers that are made or supported by advanced analytical and computational technologies, including Artificial Intelligence (AI) Systems . . . , must comply with all applicable insurance laws and regulations.”

The model bulletin addresses aspects of AI usage by insurers. It emphasizes the importance of responsible governance, risk management policies, and procedures to ensure fair and accurate outcomes for consumers.

³ See, for example, CID (2021).

There are four key sections within the model bulletin:

1. Introduction, Background, and Legislative Authority
2. Definitions
3. Regulatory Guidance and Expectations
4. Regulatory Oversight and Examination Considerations

Decisions impacting consumers that are made or supported by advanced analytical and computational technologies, including AI, must comply with all applicable insurance laws and regulations, including those regarding unfair trade practices. The bulletin sets forth state insurance regulators' expectations on how insurers should govern the use of such technologies by or on behalf of the insurer to make or support such decisions, including the creation and implementation of a written program, commensurate with an assessment of the risk. The bulletin also advises insurers regarding documentation that a state department of insurance may request during an investigation or examination.

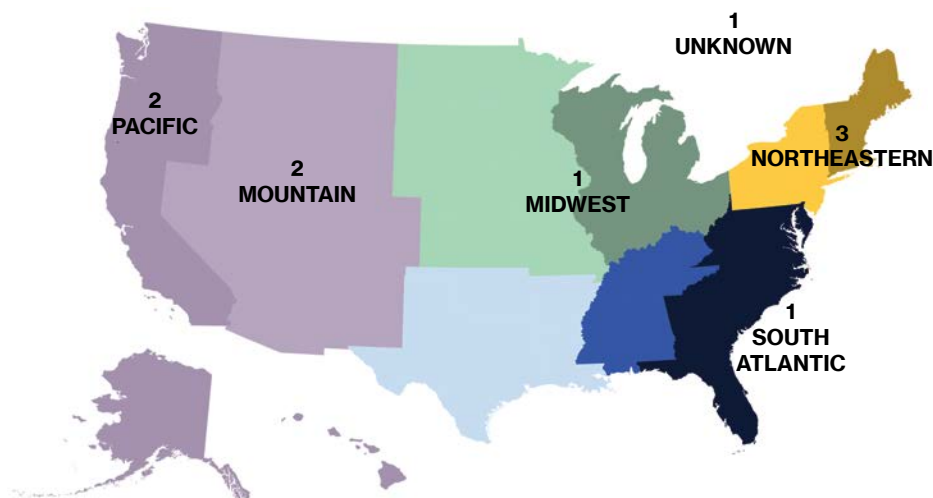
As of April 30, 2024, 11 states have adopted the bulletin, with several more states expected to follow with partial and/or full adoption (NAIC 2023b).

2. Survey on Regulator Views

To better understand regulator views regarding algorithmic bias, we constructed a survey that contained multiple-choice and short-answer questions and sent it to the insurance commissioner and one deputy commissioner in all 50 states. We received 10 responses and followed up with each individual to obtain additional clarity on their responses.

The survey was developed by Risk & Regulatory Consulting, LLC, in collaboration with the Casualty Actuarial Society (CAS) Race and Insurance Research Task Force. Out of the 10 respondents, only one responded anonymously. The responses from the other nine states represent more than 8.8% of the United States P&C personal lines direct premiums written in 2023. As shown in Figure 2, the states that we received responses from include two from the Pacific region, two from the Mountain region, one from the South Atlantic region, one from the Midwest region, and three from the Northeastern region, including New England. Despite the relatively small sample size, we observe cross-collaboration and discussion among regulators across the country in addressing algorithmic bias. For example, regulators attend NAIC meetings and are involved in NAIC working groups. Few regulators identified state-specific activities (such as research or drafting guidance) that were not connected to national-level initiatives. Therefore, we believe that the responses from 10 of 50 regulators provide a cross-section of the regulatory views in the United States.

Figure 2. Geographic Distribution of Survey Respondents



The survey consisted of four sections with questions on the following themes:

- I. Regulators’ perspectives on algorithmic bias
- II. Responsibility of the insurers
- III. Rate elements used in PPA ratemaking
- IV. The states’ current status of regulations and best practices

The survey is included in Appendix 1.

Survey Section I – Regulators’ Perspectives on Algorithmic Bias

Survey Results

Section I consisted of 12 questions in which the respondent was asked to respond to a set of statements using the following scale:

- 1 = strongly disagree
- 2 = disagree
- 3 = neither agree nor disagree
- 4 = agree
- 5 = strongly agree
- 6 = don’t know
- 7 = no opinion

Each question had an optional text box where the respondent could supplement their response.

The results are contained in Figure 3 and Figure 4.

Figure 3. Section I Survey Results: Regulators' Perspectives on Algorithmic Bias – Part 1



“New statutes are needed to address algorithmic bias. The status quo test of not excessive, not inadequate, and not unfairly discriminatory is not enough. Insurance departments need the authority to deny the use of risk characteristics and data sources that are destructive to the public good, but this authority needs to come from the state legislatures.” – *Survey respondent*

Figure 4. Section I Survey Results: Regulators' Perspectives on Algorithmic Bias – Part 2



Some of the respondents provided additional commentary on the survey questions.

Analysis and Conclusions

We concluded that it is evident from Figures 3 and 4 that while most respondents are concerned about algorithmic bias, taking a state-specific approach is not a top priority for many. That said, some states are engaged in specific initiatives, as summarized in Section IV. The respondents demonstrate regulators' desire to be consistent and follow good guidance. Some respondents indicated that they are looking to the CAS and NAIC to provide this guidance.

The respondents have mixed views on whether race (whether collected or inferred) should be used to test for algorithmic bias, and many disagree with the use of Bayesian Improved

First Name Surname Geocoding (BIFSG) as a technique to infer race. One respondent noted regarding BIFSG, “This technique has been shown to have a high error rate. . . . something with such a high error rate I would not recommend.” Further, one respondent believes it would be helpful for carriers to ask consumers to voluntarily share their race for bias testing. There are also mixed opinions regarding the question of, if race is collected or inferred by the carriers, whether it should be used as a control variable in models to control for its effects.

These responses suggest that it may be useful for actuaries and other insurance professionals to provide additional education or insights regarding the accuracy of inference methods and/or recommendations regarding legislative or regulatory actions that would allow for collection of race data. For example, there could be additional complexity to the analysis if the data is provided on a voluntary basis given that there may be differences in the portion of policyholders by racial group that choose to provide this information.

Another item of note is that while most regulators are concerned with unfair discrimination due to algorithmic bias, views are mixed regarding concerns about the availability and affordability of insurance due to algorithmic bias. If these mixed views in our survey sample reflect substantive differences of opinion among all jurisdictions, there could be challenges to developing regulations at a national level.

Survey Section II – Responsibility of the Insurers

Survey Results

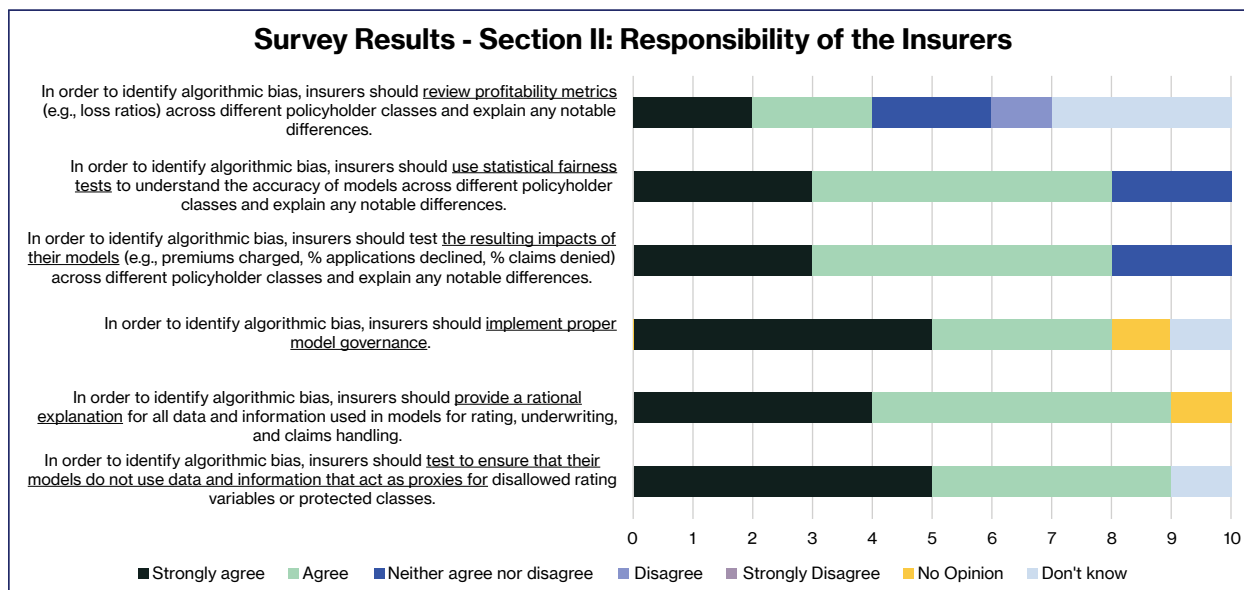
Section II consisted of six questions in which the respondent was asked to use the following scale:

- 1 = strongly disagree
- 2 = disagree
- 3 = neither agree nor disagree
- 4 = agree
- 5 = strongly agree
- 6 = don't know
- 7 = no opinion

The results are contained in Figure 5.

This section of the survey focused on regulators' perspective on the responsibility of insurers with regard to algorithmic bias. The survey asked the regulators to opine on a number of statements outlining what insurers should do to identify algorithmic bias in their models. As shown in Figure 5, the 10 respondents to our survey either strongly agree or agree with the majority of the statements. Further, only 4 of the respondents believe that insurers should review profitability metrics across different policyholder classes when identifying algorithmic bias.

Figure 5. Section II Survey Results: Responsibility of the Insurers



“We like to see an explanation of the modelling process and what controls are in place to assess the bias that is present and minimize the effect of the bias.”
 —Survey respondent

Analysis and Conclusions

Regulators generally believe the burden should be on the insurers to detect and test their models for algorithmic bias. Most regulators agree that insurers should take great care in identifying algorithmic bias – including using statistical fairness tests, reviewing the impacts of the models, implementing proper model governance, providing a rational explanation for data used, and testing to ensure that models do not use data and information that act as proxies.

Interestingly, there was less agreement regarding the use of profitability metrics such as loss ratios. While we did not receive any specific comments indicating why this may be the case, we note that many regulators have stated (in other aspects of the survey) that actuarial soundness is not sufficient to satisfy regulators’ concerns surrounding unfair discrimination, given that

1. rates are based on historical data, which may be biased, and
2. looking at actuarial soundness alone does not replace laws regarding race and other protected classes in evaluating unfair discrimination.

Survey Section III – Rate Elements Used in PPA Ratemaking

Survey Results

Section III listed out 10 rating elements and asked the respondent to indicate whether the use of each rating element in PPA ratemaking was concerning in their state.

The results are outlined in Figure 6, with the elements ranked from most to least concerning to the respondents. Respondents were also given the option to write in a variable that is concerning in their state. The only individual to answer this portion added a couple of variables to consider: “Vehicle History score, [and] factors that contemplate losses in other product lines, i.e., auto losses as a factor on Homeowner pricing.”

We followed up with the respondents who supplied contact information and asked them whether their state restricted the use of any of the rate elements. Credit history, credit-based insurance scoring, occupation, education, vehicle history scores, age, and criminal history are restricted or prohibited elements in some states. Figure 7 modifies the survey results by adding a new category, “Prohibited/restricted,” based on the responses from the states.

Analysis and Conclusions

The respondents appeared to be most concerned with the use of criminal history (unless related to driving), credit-based insurance score, occupation, and homeownership as PPA rate elements. Other notable comments regarding the rating elements include the following:

- One state does not allow the use of third-party data collected on prior motor vehicle damage or maintenance records.
- One state requires actuarial support for any discounts being offered for education.
- One respondent noted that any of the variables listed above would be allowed only if they had actuarial justification for being included in the PPA pricing.

Figure 6. Section III Survey Results: Rate Elements Used in PPA Ratemaking

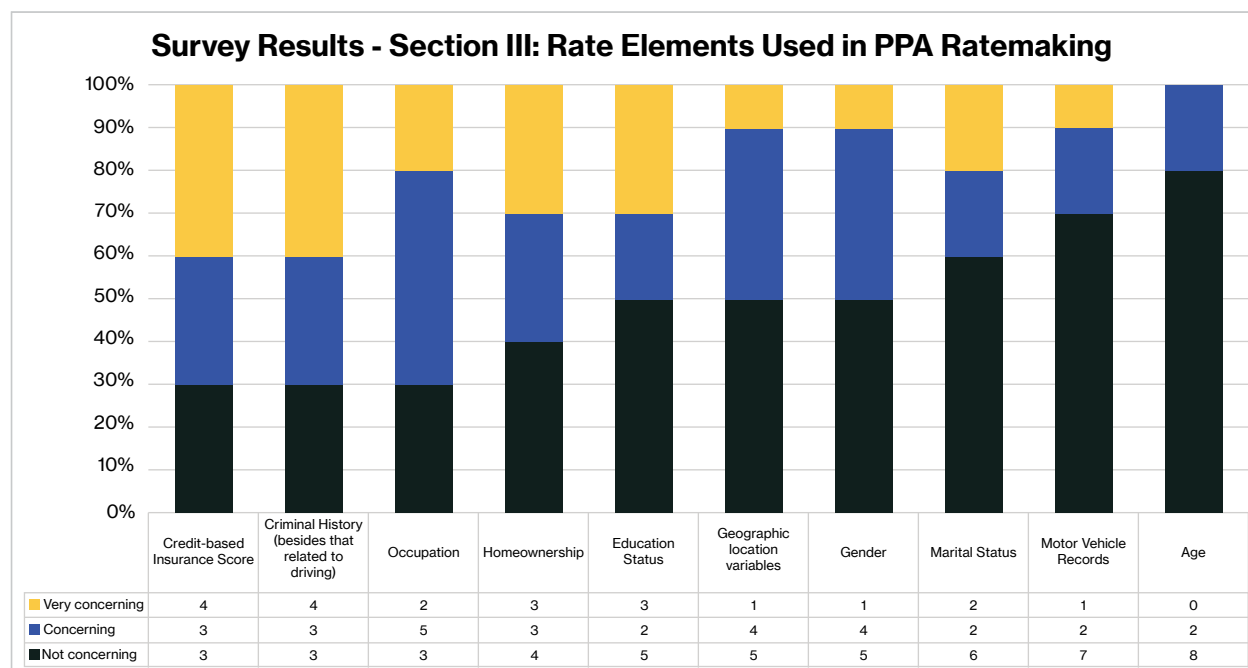
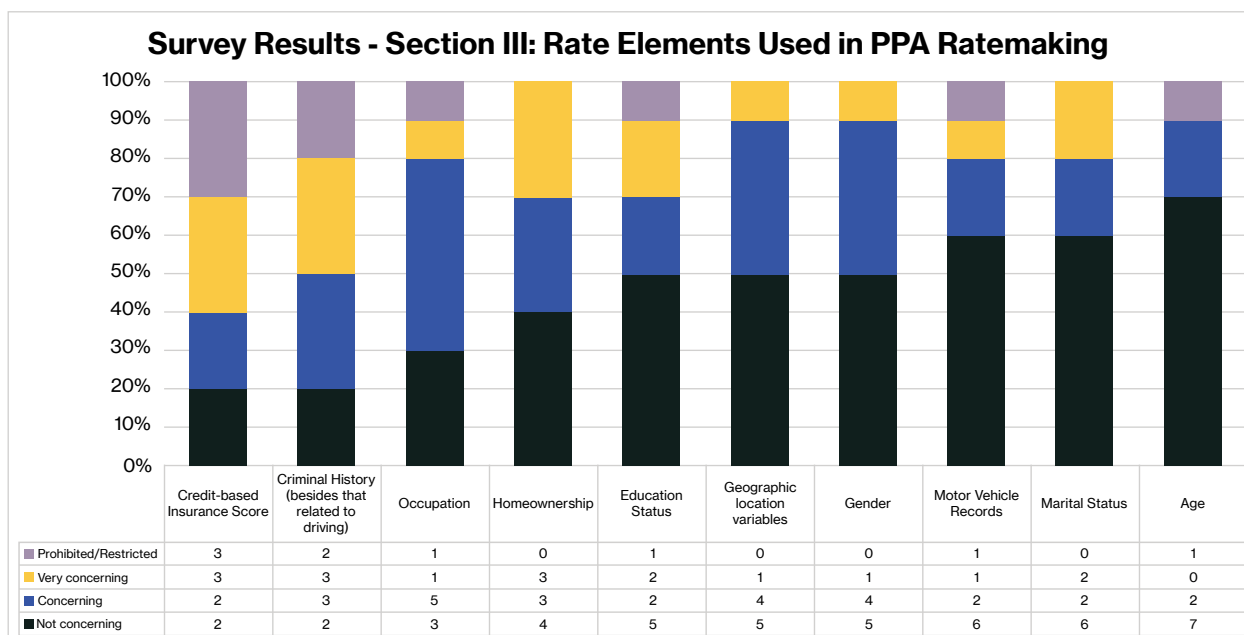


Figure 7. Section III Survey Results: Rate Elements Used in PPA Ratemaking with Prohibited/Restricted Elements



Most regulators are not concerned about the use of age, motor vehicle records, or marital status. Regulators have mixed views about the use of geographic location variables, gender, and education status.

Survey Section IV – The States’ Current Status of Regulations and Best Practices

Survey Results

Section IV of the survey contained seven open-ended questions. The respondents were asked to write out their answers, and the results are summarized in this section. We highlight the following:

1. The majority of the respondents noted that there are no pending changes to regulations and legislation related to algorithmic bias at this time. One respondent indicated that additional legislation is necessary.
2. Many individuals commented that proper documentation is needed to provide a full, accurate, and clear representation of the models and outcomes. Respondents commented in particular that new models need to be filed with the department for approval, including support for the model and its outputs.
3. The majority of respondents agreed that proper governance is necessary to combat unfair discrimination. Many cited the NAIC Model Bulletin on AI, and one respondent stated that there is future opportunity for additional market surveillance tools, certifications, and/or self-assessments to test for unfair discrimination. Another

respondent suggested that insurers review models annually, if not more frequently, to ensure that they are still appropriate for use.

4. Most regulators do not believe that evaluating rates for actuarial soundness alone satisfies their concerns surrounding unfair discrimination, given that
 - a. rates are based on historical data, which may be biased, and
 - b. concentrating on actuarial soundness alone does not replace the laws regarding race and other protected classes in evaluating unfair discrimination.

Analysis and Conclusions

The responses in Section IV suggest that while most regulators have concerns regarding the presence of unfair discrimination, unfair trade practices, or unfair claim settlement practices due to algorithmic bias, few regulators are engaged in state-specific activities (such as research or drafting guidance) to address algorithmic bias. Rather, respondents favor a consistent approach across jurisdictions. For example, many respondents referenced the NAIC Model Bulletin on AI and expect insurers to implement proper model governance and documentation of models. It is also clear that regulators are looking for transparency from actuaries in their response to regulatory and legislative requirements related to algorithmic bias.

The regulatory and legislative landscape is rapidly evolving, and we expect future changes to further clarify regulators' expectations of insurers and actuaries with regard to algorithmic bias.

3. Considerations for Actuaries

In light of the survey responses and our conversations with regulators, we suggest the following considerations for actuaries when designing and implementing models that affect insurance practices.

Test for Algorithmic Bias

The survey results indicate that regulators expect insurers (and actuaries supporting them) to test their models for algorithmic bias. There is helpful literature published by the CAS and American Academy of Actuaries (AAA) regarding these tests, including the following:

- The CAS Research Paper Series on Race and Insurance Pricing, including *Methods for Quantifying Discriminatory Effects on Protected Classes in Insurance*, by Roosevelt Mosley, FCAS, and Radost Wenman, FCAS (2022). This paper provides background on unfair discrimination and explains approaches to measuring and mitigating discriminatory effects on protected classes.
- The AAA (2023) issue brief *Approaches to Identify and/or Mitigate Bias in Property and Casualty Insurance*. This issue brief provides a survey of methods aimed at helping to identify and/or mitigate bias in rating for P&C lines.

As this is an evolving body of literature, actuaries who design and review models should consider the latest literature available regarding testing for algorithmic bias.

Embed Considerations for Algorithmic Bias throughout Modeling

Regulators responding to the survey noted that actuaries should consider algorithmic bias when selecting data used as inputs to a model, when designing the model (testing for bias), and in the outputs related to the model.

In particular, one regulator recommends considering algorithmic bias concerns as part of the cost-benefit analysis when determining which rating variables to include in a class plan.

Actuaries can consider whether algorithmic bias is considered sufficiently throughout the modeling process and identify areas for improvement. For example, actuaries can draw on insights from claims, marketing, and underwriting professionals to understand whether certain groups are or may be disproportionately impacted by the model.

Consider and Advocate for Improvements to Model Governance

Regulators surveyed highlighted the importance of proper model governance. This focus is reinforced by the regulatory activity noted in Section 1. Actuaries can provide insights and a helpful perspective as insurance companies consider changes necessary to address regulatory requirements on model governance – for example, as the NAIC Model Bulletin on AI is adopted in many states in 2024 and subsequent years.

Helpful literature/guidance regarding model governance includes the following:

- Artificial Intelligence Risk Management Framework (AI RMF 1.0) (NIST 2023)
- NAIC Model Bulletin: Use of AI Systems by Insurers (NAIC 2023b)
- ASOP 56, Modeling (Actuarial Standards Board 2019)

Actively Engage with Regulators

The regulators surveyed highlighted the importance of input from the actuarial profession.

Actuaries can consider enhancing rate filing support with narrative and exhibits regarding the considerations related to algorithmic bias in the selection of data, transformation of data into variables, model design, model validation, and model monitoring. For example, actuaries can identify potentially sensitive data inputs and describe bias-related considerations adopted in the data selection process. Actuaries can also document tests they performed to identify algorithmic bias and include related metrics.

Recognizing that actuaries are involved in the design and implementation of models for many other purposes beyond establishing rates, actuaries should consider enhancements

to governance and documentation of all models. Enhancing internal documentation related to algorithmic bias testing can be especially useful in the event that a market conduct examination requires the review of such models.

Actuaries have valuable insights to share, and their active participation in the public discourse will assist regulators and legislators as they make key decisions on algorithmic bias. Actuaries can provide comment letters and participate in public hearings related to NAIC committees, proposed legislation, and proposed regulation.

“The department sees the actuarial community as a valuable source of information, along with other objective subject matter experts like NIST, the legal community with AI expertise, academia, etc. Regulators will be looking to all these sources to develop an appropriate regulatory framework.” – *Survey respondent*

Consider Applicable ASOPs

Actuaries should consider applicable ASOPs when designing and reviewing models. We highlight a few ASOPs and sections below. The list is not intended to be exhaustive, but it provides a sampling of certain relevant sections to consider.

ASOP 12, Risk Classification (Actuarial Standards Board 2011)

This actuarial standard has helpful guidance regarding the following issues:

- How risk characteristics are selected (e.g., characteristics that are related to expected outcomes and capable of being objectively determined)
- Appropriate testing of risk classification systems for long-term viability
- Appropriate testing of risk classification systems to evaluate emerging experience and determine whether there is any significant need for change
- Testing the effects of changes, if the risk classification has changed, or if business or industry practices have changed

ASOP 23, Data Quality (Actuarial Standards Board 2016)

This actuarial standard has helpful guidance regarding the following issues:

- Selecting data, “with consideration of the following:
 - whether the data constitute appropriate data, including whether the data are sufficiently current;
 - whether the data are reasonable with particular attention to internal consistency;
 - whether the data are reasonable given relevant external information that is readily available and known to the actuary;
 - the degree to which the data are sufficient;

- any known significant limitations of the data;
- the availability of additional or alternative data and the benefit to be gained from such additional or alternative data, balanced against how practical it is to collect and compile such additional or alternative data; and
- sampling methods, if used to collect the data”
- Reviewing data that is questionable or inconsistent

ASOP 41, Actuarial Communications (Actuarial Standards Board 2010)

This actuarial standard has helpful guidance regarding the following issues:

- When an actuary should complete an actuarial report
- Documentation requirements, including that “in the actuarial report, the actuary should state the actuarial findings, and identify the methods, procedures, assumptions, and data used by the actuary with sufficient clarity that another actuary qualified in the same practice area could make an objective appraisal of the reasonableness of the actuary’s work as presented in the actuarial report”
- Reliance on data sources or information
- Identification of the party responsible for each material assumption and method

ASOP 56, Modeling (Actuarial Standards Board 2019)

This actuarial standard has helpful guidance regarding the following issues:

- Understanding the model’s intended purpose and
 - designing the model according to the intended purpose;
 - confirming that the model structure, data, assumptions, governance and controls, and model testing and output validation are consistent with the intended purpose;
 - assessing the model structure for the intended purpose; and
 - confirming the appropriateness of the data and assumptions
- Understanding the model, including weaknesses and limitations
- Reliance on models developed by others
- Evaluating model risks
- Testing the model inputs, assumptions, and outputs
- Model validation
- Reasonable governance and controls
- Appropriate documentation and disclosures

4. Conclusion

While this study captures regulatory views as of May 2024, we recognize that the regulatory and legislative landscape relative to algorithmic bias is rapidly evolving. As this report was being written, many states adopted a version of the NAIC Model Bulletin on AI, and other regulation regarding algorithmic bias is actively under consideration. In particular, we note that the New York Department of Financial Services issued Insurance Circular Letter No. 7 on July 11, 2024 (NYDFS 2024b). This is summarized in Appendix 4.

As of the date of this report, it is unclear how various legislative and regulatory changes will impact actuaries. Many questions are still unanswered, including the following:

1. Which tests to identify and address algorithmic bias are acceptable to regulators? Will some become required? If required,
 - a. how often would testing need to be performed for existing models,
 - b. what tolerance levels are appropriate for such testing, and
 - c. will the same requirements apply to large and small insurers?
2. How should insurers test for bias with respect to racial and ethnic minorities, given that the data is typically not captured?
3. What model governance and documentation will be required in order to meet legislative and regulatory expectations?
4. What kind of due diligence and methods should insurers apply to assess third-party AI systems and external data?

That said, as we look to the future, it is clear that actuaries have valuable insights to share, and their active participation in the public discourse will assist regulators and legislators as they attempt to answer the questions that lie ahead.

Appendix 1: Survey

Notes on Survey

- All questions relate to Property and Casualty Insurance Practices only.
- For the purposes of this survey, we define the following terms:
 - “Artificial Intelligence (AI)” refers to a branch of computer science that uses data processing systems that perform functions normally associated with human intelligence, such as reasoning, learning, and self-improvement, or the capability of a device to perform functions that are normally associated with human intelligence such as reasoning, learning, and self-improvement. This definition considers machine learning to be a subset of artificial intelligence.⁴
 - “Predictive Model” refers to the mining of historic data using algorithms and/or machine learning to identify patterns and predict outcomes that can be used to make or support the making of decisions.⁵
 - “Machine Learning (ML)” refers to a field within artificial intelligence that focuses on the ability of computers to learn from provided data without being explicitly programmed.
 - “Unfair discrimination”, “unfair trade practices” and “unfair claim settlement practices” may be interpreted in accordance with the applicable laws of your state.

We recognize that there are different definitions and understanding of the term “Algorithmic bias”. In this survey, we will refer to the term and also ask you for how you understand the term. For the purposes of the multiple-choice questions, we ask that you answer those using a broad definition of Algorithmic Bias which includes systemic, human and statistical biases. These categories of bias are described in a paper published by the National Institute of Standards and Technology (NIST).⁶ This paper discusses those categories further:

Systemic Bias – Systemic biases result from procedures and practices of particular institutions that operate in ways which result in certain social groups being advantaged or favored and others being disadvantaged or devalued. This need not be the result of any conscious prejudice or discrimination but rather of the majority following existing rules or norms.

Human Bias – Human biases reflect systematic errors in human thought based on a limited number of heuristic principles and predicting values to simpler judgmental operations. These biases are often implicit and tend to relate to how an individual

⁴ This is the definition included in the NAIC Model Bulletin, Use of Artificial Intelligence Systems by Insurers, Adopted December 4, 2023.

⁵ Ibid.

⁶ <https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1270.pdf>.

or group perceives information (such as automated AI output) to make a decision or fill in missing or unknown information.

Statistical Bias – Statistical and computational biases stem from errors that result when the sample is not representative of the population.

Section I

Using the following scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree, 6 = don't know, 7 = no opinion, please respond to the following statements:

1. Our Department has concerns regarding the presence of unfair discrimination in insurance practices, unfair trade practices, or unfair claim settlement practices⁷ due to algorithmic bias.
2. Our Department has concerns regarding the availability and affordability of insurance due to algorithmic bias.
3. Addressing algorithmic bias is one of our top priorities.
4. There should be a standard AI governance framework adopted by all NAIC jurisdictions that addresses algorithmic bias.
5. Our state is currently working on proposing or enacting legislation related to algorithmic bias.
6. We plan to pursue or have pursued our own research on evaluating algorithmic bias in Private Passenger Automobile (PPA) Insurance or Homeowners Insurance.
7. We are planning to draft or have drafted a model questionnaire related to algorithmic bias that will be required by insurers when submitting model filings.
8. We have initiated or are considering initiating market conduct examinations to review property/casualty insurers' use of models in its underwriting, claims and marketing practices.
9. Bayesian Improved First Name Surname and Geocoding (BIFSG) is a technique used to infer race based on first name, last name and geo location. The Department accepts such techniques as valid techniques to infer race in order to test for algorithmic bias.
10. Race (whether collected or inferred) is permissible to use in order to test for algorithmic bias.
11. Race (whether collected or inferred) should be included as a control variable in models to control for its effects.
12. Evaluating rates for actuarial soundness satisfies regulators' concerns surrounding unfair discrimination.

⁷ These terms should be understood as legally defined in your state.

Section II

Rank the following value statements regarding methods to identify potential algorithmic bias using the following scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree, 6 = don't know, 7 = no opinion

1. In order to identify algorithmic bias, insurers should **test the resulting impacts of their models** (e.g., premiums charged, % applications declined, % claims denied) across different policyholder classes and explain any notable differences.
2. In order to identify algorithmic bias, insurers should **use statistical fairness tests to understand the accuracy of models** across different policyholder classes and explain any notable differences.
3. In order to identify algorithmic bias, insurers should **implement proper model governance**.
4. In order to identify algorithmic bias, insurers should **review profitability metrics (e.g., loss ratios)** across different policyholder classes and explain any notable differences.
5. In order to identify algorithmic bias, insurers should **test to ensure that their models do not use data and information that act as proxies** for disallowed rating variables or protected classes.
6. In order to identify algorithmic bias, insurers should **provide a rational explanation** for all data and information used in models for rating, underwriting and claims handling.

Section III

Please indicate whether the use of the following rating elements in private passenger auto (PPA) rates are concerning in your state:

1. Credit-based insurance score
2. Geographic location variables
3. Homeownership
4. Motor vehicle records
5. Marital status
6. Criminal history (besides that related to driving)
7. Gender
8. Age
9. Education status
10. Occupation
11. Other [allow write-ins]

Section IV

Please provide a response to each of the following items:

1. Discuss the changes to regulation and legislation being considered in your state to address concerns related to unfair discrimination, availability and affordability of insurance due to algorithmic bias embedded in AI tools used by insurers.
2. What does the Department expect related to proper documentation of its use of models? In what ways do you enforce this expectation? Do you plan to change requirements for proper documentation and/or any forms of enforcement?
3. What best practices do you expect carriers to employ on proper governance of models to ensure against unfair discrimination? In what ways do you enforce this expectation? Do you plan to change requirements for proper governance of models and/or any forms of enforcement?
4. What practical considerations and recommendations do you have for actuaries who need to respond to regulatory and legislative requirements related to algorithmic bias?
5. How is algorithmic bias defined in your state?
6. Please provide any additional input related to these topics which has not already been addressed.
7. If you have indicated any legislation or bulletins in your state currently being proposed, please list those.
8. Can we reach out if we have questions regarding your responses? If so, please provide your contact information.

Appendix 2: Actuarial Standards Related to Legislation and Regulation

The references to regulatory standards appear throughout various Actuarial Standards of Practice (ASOPs). ASOP 1 (Actuarial Standards Board 2013), Introductory Actuarial Standard of Practice, Section 1, states that ASOPs are binding on members of U.S.-based actuarial organizations when rendering actuarial services in the United States. While these ASOPs are binding, they are not the only considerations that affect an actuary's work. Other considerations may include legal and regulatory requirements, professional requirements promulgated by employers or actuarial organizations, evolving actuarial practice, and the actuary's own professional judgment informed by the nature of the engagement.

In Section 3.1.5, ASOP 1 states that there are situations in which applicable law (statutes, regulations, and other legally binding authority) may require the actuary to deviate from the guidance of an ASOP. Where requirements of law conflict with the guidance of an ASOP, the requirements of law shall govern.

ASOP 56 (Actuarial Standards Board 2019), Modeling, states in Section 3.5 that the actuary may rely on experts in the fields of knowledge used in the development of the model. In determining the appropriate level of reliance, the actuary may consider the following . . . (c) whether there are industry or regulatory standards that apply to the model or to the testing or validation of the model, and whether the model has been certified as having met such standard.

ASOP 53 (Actuarial Standards Board 2017), Estimating Future Costs for Prospective Property/Casualty Risk Transfer and Risk Retention, states in Section 3.8.4 that the actuary should consider whether additional adjustments to the historical data are needed to reflect the environment expected to exist in the period for which the future costs are being estimated. If the actuary makes adjustments, these adjustments should be made so that the historical data are stated and used on a consistent basis. Examples of changes that may suggest the need for adjustments include the following . . . (a) judicial, legislative, or regulatory changes.

Appendix 3: Relevant Existing Model Laws

Unfair Trade Practices Model Act

The Unfair Trade Practices Model Act (NAIC 2024f) defines practices that constitute unfair methods of competition or unfair or deceptive acts and practices and prohibits the trade practices so defined or determined.

The model act prohibits these notable defined or determined trade practices:

1. Misrepresentations and false advertising of insurance policies: Making any estimate, illustration, circular or statement, sales presentation, omission, or comparison that leads to several identified misrepresentations, such as misrepresenting the conditions or terms of a policy.
2. False statements and entries: “Knowingly making any false entry of a material fact in any book, report, or statement of any insurer or knowingly omitting to make a true entry of any material fact pertaining to the business of such insurer in any book, report, or statement of such insurer, or knowingly making any false material statement to any insurance department official.”
3. Unfair discrimination:
 - a. “Making or permitting any unfair discrimination between individuals or risks of the same class and of essentially the same hazard by refusing to insure, refusing to renew, canceling, or limiting the amount of insurance coverage on a property or casualty risk solely because of the geographic location of the risk, unless such action is the result of the application of sound underwriting and actuarial principles related to actual or reasonably anticipated loss experience.”
 - b. “Making or permitting any unfair discrimination between individuals or risks of the same class and of essentially the same hazards by refusing to insure, refusing to renew, canceling, or limiting the amount of insurance coverage on the residential property risk, or the personal property contained therein, solely because of the age of the residential property.”
 - c. “Refusing to insure, refusing to continue to insure, or limiting the amount of coverage available to an individual because of the sex, marital status, race, religion, or national origin of the individual; however, nothing in this subsection shall prohibit an insurer from taking marital status into account for the purpose of defining persons eligible for dependent benefits. Nothing in this section shall prohibit or limit the operation of fraternal benefit societies.”
 - d. “To terminate, or to modify coverage or to refuse to issue or refuse to renew any property or casualty policy solely because the applicant or insured or any employee of either is mentally or physically impaired; provided that this subsection shall not apply to accident and health insurance sold by a casualty insurer and, provided further, that this subsection shall not be interpreted to modify any other provision of law relating to the termination, modification, issuance, or renewal of any insurance policy or contract.”

In Section 4, the model act states that the insurance commissioner shall have power to examine and investigate the affairs of every person or insurer in the state in order to determine whether such person or insurer has been or is engaged in any unfair trade practice prohibited by this act.

Unfair Claims Settlement Practices Model Act

The Unfair Claims Settlement Practices Model Act (NAIC 1997) was established by the National Association of Insurance Commissioners (NAIC) to set standards for the investigation and disposition of claims arising under insurance policies. Several unfair claims practices are defined.

Two of the notable defined practices are as follows:

1. “Failing to adopt and implement reasonable standards for the prompt investigation and settlement of claims arising under [the act’s] policies”
2. “Not attempting in good faith to effectuate prompt, fair, and equitable settlement of claims submitted in which liability has become reasonably clear”

Corporate Governance Annual Disclosure Model Act and Regulation

Proper governance of models is very important in ensuring that the models are not used in violation of statutes or in a manner that is unfair to consumers.

The Corporate Governance Annual Disclosure Model Act and Regulation (NAIC 2014) is designed to provide the insurance commissioner with a summary of an insurer’s or insurance group’s corporate governance structure, policies, and practices. It outlines the requirements for completing a corporate governance annual disclosure (CGAD). It provides for the confidential treatment of the CGAD and related information. The Act and Regulation does not prescribe or impose corporate governance standards or internal procedures beyond that which is required under applicable state corporate law.

The model act requires every U.S. insurer (or the insurance group of which the insurer is a member) to submit a CGAD to its lead state or domestic regulator on an annual basis. Insurers must document confidential information about their corporate governance framework. This includes the policies of their boards of directors and key committees, the frequency of their meetings, and the procedure for the oversight of critical risk areas and appointment practices. The information is used by insurance regulators to understand, review, and assess the corporate governance practices of insurers.

Property and Casualty Model Rating Law

The Property and Casualty Model Rating Law (NAIC 2009, 2010) is designed to regulate insurance rates. One purpose of this model law is to ensure that insurance rates are not excessive, inadequate, or unfairly discriminatory. The Model Rating Law also serves to improve the availability, fairness, and reliability of insurance.

Market Conduct Surveillance Model Law

The Market Conduct Surveillance Model Law (NAIC 2004) is designed to establish a framework for insurance department market conduct actions. The model law includes processes and systems for identifying, assessing, and prioritizing market conduct problems that have a substantial adverse impact on consumers, policyholders, and claimants. The model law also outlines market conduct actions by a commissioner to substantiate such market conduct problems and a means to remedy significant market conduct problems. The model law provides procedures to communicate and coordinate market conduct actions among states to foster the most efficient and effective use of resources.

Appendix 4: New York Department of Financial Services Insurance Circular Letter No. 7

On July 11, 2024, the New York Department of Financial Services issued Insurance Circular Letter No. 7 regarding Use of Artificial Intelligence Systems (AIS) and External Consumer Data and Information Sources (ECDIS) in Insurance Underwriting and Pricing (the “Circular”). Since the Circular was issued after this research was completed, it is not discussed or considered in the body of this report. This Appendix provides a summary of topics included in the Circular that are pertinent to this report.

With respect to unfair and unlawful discrimination, the Circular states that:

“An insurer should not use ECDIS or AIS in underwriting or pricing unless the insurer can establish through a comprehensive assessment that the underwriting or pricing guidelines are not unfairly or unlawfully discriminatory in violation of the Insurance Law.” (The Circular, paragraph 15.)

Purpose

The Circular states its purpose as follows:

“The purpose of this Circular Letter is to identify the Department’s expectations that all insurers authorized to write insurance in New York State, Article 43 corporations, health maintenance organizations, licensed fraternal benefit societies, and the New York State Insurance Fund (collectively, “insurers”) develop and manage their use of ECDIS, AIS, and other predictive models in underwriting and pricing insurance policies and annuity contracts.” (The Circular, paragraph 2.)

Definitions

ECDIS and AIS are defined in the Circular as follows:

“For purposes of this Circular Letter, ECDIS includes data or information used – in whole or in part – to supplement traditional medical, property or casualty underwriting or pricing, as a proxy for traditional medical, property or casualty underwriting or pricing, or to identify “lifestyle indicators” that may contribute to an underwriting or pricing assessment of an applicant for insurance coverage. ECDIS does not include an MIB Group, Inc. member information exchange service, a motor vehicle report, prescription drug data, or a criminal history search. An insurer conducting a criminal history search for insurance underwriting and pricing purposes must comply with Executive Law j 296(16). See e.g., Insurance Circular Letter No. 13 (2022).” (The Circular, paragraph 6.)

“For purposes of this Circular Letter, AIS means any machine-based system designed to perform functions normally associated with human intelligence, such as reasoning, learning, and self-improvement, that is used – in whole or

in part – to supplement traditional health, life, property or casualty underwriting or pricing, as a proxy for traditional health, life, property or casualty underwriting or pricing, or to identify “lifestyle indicators” that may contribute to an underwriting or pricing assessment of an applicant for insurance coverage.” (The Circular, paragraph 5.)

Comprehensive Assessment

The Circular indicates a step-by-step process to ascertain “whether an underwriting or pricing guideline derived from ECDIS or AIS unfairly discriminates between similarly situated individuals or unlawfully discriminates against a protected class.” (The Circular, paragraph 15.) The process, at a minimum, should include the following steps:

Step 1: Determine whether there is a prima facie showing of a disproportionate adverse effect due to the use of ECDIS or AIS for similarly situated insureds or insureds of a protected class. “This assessment should be conducted for any protected class where membership in such protected class either may be determined using data available to the insurer or may be reasonably inferred using accepted statistical methodologies.” If yes, proceed to Step 2. If no, conclude evaluation.

Step 2: Assess whether there is a “legitimate, lawful, and fair explanation or rationale for the differential” identified in Step 1. If yes, proceed to Step 3. If no, insurer should modify the practice under evaluation.

Step 3: Conduct a search for a less discriminatory methodology that would “reasonably meet the insurer’s legitimate business needs.” If yes, the insurer should modify the practice under evaluation. If no, the insurer should “conduct ongoing model risk management . . . and repeat Step 3 at least annually.”

The Circular discusses that when completing the analysis discussed above, insurers are encouraged to use multiple statistical metrics and lists a number of metrics to consider. These metrics include Adverse Impact Ratio, Denial Odds Ratios, Marginal Effects, Standardized Mean Differences, Z-tests and T-tests, and Drivers of Disparity (The Circular, paragraph 18). The Circular also discusses that, in addition to quantitative analysis, the insurer’s comprehensive assessment should include a qualitative assessment of unfair or unlawful discrimination (The Circular, paragraph 19).

Other Notable Requirements

Requirements regarding actuarial support, third-party vendors, and documentation include:

“As with any other variables employed in underwriting and pricing, insurers should be able to demonstrate that the ECDIS are supported by generally accepted actuarial standards of practice and are based on actual or reasonably anticipated experience, including, but not limited to, statistical studies, predictive modeling, and risk assessments. The underlying analyses should demonstrate a clear, empirical, statistically significant, rational, and not unfairly discriminatory relationship between the variables used and the relevant risk of the insured.” (The Circular, paragraph 11.)

“When using ECDIS or AIS as part of their insurance business, insurers are responsible for complying with these anti-discrimination laws irrespective of whether they themselves are collecting data and directly underwriting consumers, or relying on ECDIS or AIS of external vendors that are intended to be partial or full substitutes for direct underwriting or pricing. An insurer may not use ECDIS or AIS to collect or use information that the insurer would otherwise be prohibited from collecting or using directly. An insurer may not rely solely on a third-party’s claim of non-discrimination or a proprietary third-party process to determine compliance with anti-discrimination laws. The responsibility to comply with anti-discrimination laws remains with the insurer at all times.” (The Circular, paragraph 14.)

“An insurer should appropriately document the processes and reasoning behind its testing methodologies and analysis for unfair or unlawful discrimination commensurate with the insurer’s use of ECDIS and AIS and the complexity and materiality of such ECDIS and AIS. An insurer should be prepared to make such documentation available to the Department upon request.” (The Circular, paragraph 16.)

A description of the type of documentation to be included is in paragraph 29 of the Circular.

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