The Big Data (EX) Working Group of the Innovation and Technology (EX) Task Force met in Austin, TX, Dec. 7, 2019. The following Working Group members participated: Doug Ommen, Chair (IA); Elizabeth Kelleher Dwyer, Vice Chair, represented by Matt Gendron (RI); George Bradner and Wanchin Chou (CT); Stephen C. Taylor and Sharon Shipp (DC); Frank Pyle (DE); Sandra Starnes (FL); Robert Muriel and Judy Mottar (IL); Rich Piazza (LA); Robert Baron (MD); Timothy Schott (ME); Karen Dennis (MI); Phil Vigliaturo (MN); Angela Nelson (MO); Christian Citarella (NH); Seong-min Eom (NJ); Jillian Froment (OH); Andrew Stolfi and TK Keen (OR); Michael McKenney and Shannen Logue (PA); Kendall Buchanan (SC); Rachel Cloyd and J’ne Byckovski (TX); Tomasz Serbinski (UT); and Christina Rouleau (VT).

1. **Adopted its Oct. 7 Minutes**

The Working Group met Oct. 7 and took the following action: 1) adopted its Summer National Meeting minutes; and 2) discussed the use of big data in fraud detection and claim settlement.

Mr. Bradner made a motion, seconded by Ms. Nelson, to adopt the Working Group’s Oct. 7 minutes (Attachment One-A). The motion passed unanimously.

2. **Discussed the Use of Big Data in Fraud Detection and Claim Settlement**

Commissioner Ommen said the Working Group heard a presentation at the Summer National Meeting from Kevin Rawlins (Insurance Services Office—ISO) about ISO’s ClaimSearch and a presentation from Alan Haskins (National Insurance Crime Bureau—NICB) about NICB’s fraud detection services. Commissioner Ommen said the Working Group also heard a presentation during its Oct. 7 conference call from Carlos Martins (ISO) about ISO’s claims solutions.

Commissioner Ommen reviewed the three charges of the Working Group. He said the fraud detection and claims settlement practices discussed by the Working Group are subject to his regulatory jurisdiction under both Iowa’s unfair trade law and Iowa’s unfair claim settlement practices provisions, which are based on the NAIC Unfair Claims Settlement Practices Act (#900). He asked if the Working Group members have any observations about the adequacy of the current state insurance regulatory framework used to oversee the use of big data in fraud detection and claim settlement.

Ms. Nelson said she has concerns about the use of non-insurance data in fraud detection models because consumers may not know data about them is being used and how to correct inaccurate data. She said this concern is heightened with the use of third-party vendors because state insurance regulators may have challenges with access to information of third-party vendors.

Mr. McKenney said the presentations from ISO suggested there is not a lot of oversight by insurers.

Mr. Baron said the Maryland Insurance Administration would hold the licensee accountable, similar to how insurers are held accountable for the action of independent adjusters who have been hired.

Birny Birnbaum (Center for Economic Justice—CEJ) said there is a need for additional oversight of third-party vendors, which he believes are operating as advisory organizations. He said state insurance regulators should review whether an insurer’s practices result in disparate impact and should require insurers to disclose to consumers what third-party data and algorithms are being used.

Peter Kochenburger (University of Connecticut School of Law) said even if the states have regulatory authority under unfair trade laws, consumers need to know what data is being used because the accuracy of data can only be determined by the consumer. He said similar protections found in the federal Fair Credit Reporting Act should be applied to the use of data for fraud detection and claim settlement.

Commissioner Ommen said he would hold the insurer responsible for validating the accuracy of the data and model outputs.

Mr. Gendron said state insurance regulators need more detail on how insurers ensure the accuracy of data being used.
Mr. Bradner agreed and said insurers’ use of data from third-party vendors and how insurers validate the accuracy of this data warrants additional discussion.

3. **Received a Report from the Casualty Actuarial and Statistical (C) Task Force**

Mr. Piazza said the Casualty Actuarial and Statistical (C) Task Force has the following three charges to coordinate with the Big Data (EX) Working Group: 1) facilitate training and sharing of expertise on predictive analytics; 2) draft guidance for the review of state rate filings based on complex predictive models; and 3) draft changes to the *Product Filing Review Handbook* to include best practices for review of predictive models and analytics filed by insurers to justify rates.

Regarding the first charge, Mr. Piazza said the Task Force conducts monthly public education webinars on rate filings and regulator-to-regulator conference calls on specific rate filings of concern. He said the Task Force’s public calls since the Summer National Meeting addressed neural network, natural language processing, analytics and actual data-mining, and the open source model “R” and predictive analytics.

Regarding the two other charges, Mr. Piazza said the Task Force exposed the most recent draft of the regulatory review of predictive modeling white paper on Oct. 15 for a public comment period ending Nov. 22. The Task Force received comments from 11 interested parties and is beginning its review of the comments.

4. **Received a Report from the Accelerated Underwriting (A) Working Group**

Director Muriel said the Accelerated Underwriting (A) Working Group met Oct. 2 to review a work plan for accomplishing its charge, which is to “consider the use of external data and data analytics in accelerated life underwriting, including consideration of the ongoing work of the Life Actuarial (A) Task Force on the issue and, if appropriate, drafting guidance for the states.” He said the work plan contemplates three general phases: 1) gather information; identify issues and the best ways to address them (white paper, model bulletin, model law or something else); and 3) develop a work product by the 2020 Fall National Meeting.

5. **Received an Update on NAIC Technical and Non-Technical Rate Review Trainings**

Kris DeFrain (NAIC) said the NAIC has been sponsoring predictive analytics training since 2017 through what is called the “Book Club” of the Casualty Actuarial and Statistical (C) Task Force. She said the topics presented at the “Book Club” are mostly focused on the review of predictive analytics in property/casualty (P/C) rate filings. She said the NAIC is developing non-technical and technical training. The non-technical training will be provided to rate filing reviewers and market conduct examiners and focus on how to ensure vital information is contained in a rate filing, how to evaluate rate classes for unfair discrimination and understanding when additional actuarial assistance may be needed.

Ms. DeFrain said this training will be conducted after the Task Force completes its white paper toward the end of this year or early in 2020. She said the technical training will be conducted by the NAIC’s consultant, Dorothy Andrews (Actuarial & Analytics Consortium LLC), and will focus on training actuaries and statisticians. Ms. DeFrain said the technical training will be presented through on-demand modules and will focus on data inputs, mathematical distributions and statistical techniques.

In response to Commissioner Ommen’s question about training addressing the use of models in fraud detection, Ms. DeFrain said the training will focus on rate models but could be expanded in the future to include the assessment of models used for fraud detection and claim settlement.

Mr. Vigliaturo said the technical training is very good, and each session takes approximately 12 hours to complete. He said the courses will increase the knowledge of participants but will not necessarily lead to a quicker review of rate filings. He suggested the training be added to the list of courses for the NAIC’s Insurance Regulator Professional Designation Program.

6. **Heard a Presentation from the CEJ on the Role of Advisory Organizations**

Mr. Birnbaum provided a presentation on the history of advisory organizations, current regulatory requirements for advisory organizations and third-party vendors that he believes are operating as unlicensed advisory organizations. He said the federal McCarran-Ferguson Act provides insurers with a limited exemption from federal antitrust laws to the extent that insurance is regulated by the states. Without this exemption from antitrust laws, he said insurers would not be able to use advisory organizations to collect and compile historical information for ratemaking purposes. He said the states have oversight of these activities through the licensing of advisory organizations.
In the late 1980s, Mr. Birnbaum said a number of state attorneys general brought legal action against the ISO, alleging its involvement in anticompetitive activities. He said the ISO settled this litigation by changing its corporate structure and going to loss costs in states for lines of insurance where it had not already done so.

By the early 1990s, Mr. Birnbaum said more states had enacted legislation to require organizations to file prospective loss costs instead of fully developed rates. He said rating organizations became more widely referred to as advisory organizations, with state insurance regulators having oversight of data collected and algorithms used for loss costs. He said the states conduct advisory organization examinations to determine that an advisory organization is performing its permitted regulated functions in a manner consistent with state rating laws and in a manner that results in accurate and compliant products or services for its subscribing companies.

Mr. Birnbaum said new third-party vendors engaged in collecting decision marking are not licensed as advisory organizations. He said the following activities raise antitrust concerns that require state supervision of organizations exempt from federal antitrust laws: 1) collecting data from insurers; 2) adding additional data to insurer data; and 3) analyzing the data to produce pricing recommendations in the form of prospective loss costs or risk classification.

Mr. Birnbaum questioned what the functional difference is between ISO, which is licensed as an advisory organization and produces personal auto risk classification relativities and third-party vendors, such as TransUnion, which provide credit scores, criminal history scores or vehicle scores. He said there is a need to create the accountability and regulatory oversight of vendors of big data algorithms as envisioned in antitrust laws and advisory organization statutes. He said this may mean not only bringing regulatory oversight to third-party algorithm vendors, but also updating advisory organization requirements and procedures for the era of big data.

Commissioner Ommen said this is an important issue to which the Working Group should give further consideration.

Having no further business, the Big Data (EX) Working Group adjourned.
Regulatory Review of Predictive Models

Richard Piazza, ACAS, MAAA
Chief Actuary, Louisiana

August 4, 2020
Draft white paper: *Regulatory Review of Predictive Models*

- Charges and Scope
- Agreed Principles
- Best Practices
- Drafting Issues Addressed
- Other Content
- Status of Paper
• Draft and propose changes to the *Product Filing Review Handbook* to include best practices for review of predictive models and analytics filed by insurers to justify rates.

• Draft and propose state guidance (e.g., information, data) for rate filings based on complex predictive models
When reviewing a rate filing that is based in whole or in part on predictive model, the "problem" regulators want to solve is probably better posed as seeking an answer to this question:

How can regulators determine that predictive models, as used in rate filings, are compliant with state laws and regulations?
## Agreed Principles

State insurance regulators will...

<table>
<thead>
<tr>
<th>Maintain current rate regulatory authority and autonomy</th>
<th>Be able to share information</th>
<th>Share expertise and discuss technical issues</th>
<th>Maintain confidentiality in accordance with state law</th>
</tr>
</thead>
</table>

© 2020 National Association of Insurance Commissioners

© 2020 National Association of Insurance Commissioners
Best Practices for Regulatory Review

- Ensure compliance with rating laws; Rates shall not be excessive, inadequate, or unfairly discriminatory
- Review all aspects of the model: data, assumptions, adjustments, variables, input, and resulting output.
- Evaluate how the model interacts with and improves the rating plan.
- Enable competition and innovation.
Ensure compliance with rating laws; Rates shall not be excessive, inadequate, or unfairly discriminatory.

- Review the overall rate level impact of the proposed revisions to rate level indications provided by the filer.
- Determine that individual input characteristics are related to the expected loss or expense differences in risk.
- Review the premium disruption for individual policyholders and how the disruptions can be explained to individual consumers.
- Review the individual input characteristics to and output factors from the predictive model (and its sub-models), as well as associated selected relativities, to ensure they are compatible with practices allowed in the state and do not reflect prohibited characteristics.
Review all aspects of the model: data, assumptions, adjustments, variables, input, and resulting output.

- Obtain a clear understanding of how the selected predictive model was built.
- Determine that the data used as input to the predictive model is accurate, including a clear understanding how missing values, erroneous values and outliers are handled.
- Determine that any adjustments to the raw data are handled appropriately, including but not limited to, trending, development, capping and removal of catastrophes.
- Obtain a clear understanding of how often each risk characteristic, used as input to the model, is updated and whether the model is periodically refreshed, so model output reflects changes to non-static risk characteristics.
Evaluate how the model interacts with and improves the rating plan.

- Obtain a clear understanding of the characteristics that are input to a predictive model (and its sub-models).
- Obtain a clear understanding how the insurer integrates the model into the rating plan and how it improves the rating plan.
- Obtain a clear understanding of how model output interacts with non-modeled characteristics/variables used to calculate a risk’s premium.
Enable competition and innovation.

- Enable innovation in the pricing of insurance through acceptance of predictive models, provided models are in compliance with state laws, particularly prohibitions on unfair discrimination.
- Protect the confidentiality of filed predictive models and supporting information in accordance with state law.
- Review predictive models in a timely manner to enable reasonable speed to market.
Content of White Paper

- Proposed Changes to the Product Filing Review Handbook.
- Proposed State Guidance, including information elements for a regulator to meet Best Practices’ objectives when reviewing a GLM.
- Glossary of terms.
- Sample rate-disruption template.
- Other considerations.
79 Information Elements appear in Appendix B organized as follows:

- **Selecting Model Input**
  - Available Data Sources
  - Sub-Models
  - Adjustments to Data
  - Data Organization

- **Building the Model**
  - High-Level Narrative for Building the Model
  - Medium-Level Narrative for Building the Model
  - Predictor Variables
  - Adjusting Data, Model Validation and Goodness-of-Fit Measures
  - “Old Model” Versus “New Model”
  - Modeler Software

- **The Filed Rating Plan**
  - General Impact of Model on Rating Algorithm
  - Relevance of Variables and Relationship to Risk of Loss
  - Comparison of Model Outputs to Current and Selected Rating Factors
  - Responses to Data, Credibility and Granularity Issues
  - Definitions of Rating Variables
  - Supporting Data
  - Consumer Impacts
  - Accurate Translation of Model into a Rating Plan
  - Efficient and Effective Review of Rate Filing
| Information Element A.1.a: | Request details of all data sources, whether internal to the company or from external sources. For insurance experience (policy or claim), determine whether data are aggregated by calendar, accident, fiscal or policy year and when it was last evaluated. For each data source, get a list all data elements used as input to the model that came from that source. For insurance data, get a list all companies whose data is included in the datasets.

Request details of any non-insurance data used (customer-provided or other), whether the data was collected by use of a questionnaire/checklist, whether data was voluntarily reported by the applicant, and whether any of the data is subject to the Fair Credit Reporting Act. If the data is from an outside source, find out what steps were taken to verify the data was accurate, complete and unbiased in terms of relevant and representative time frame, representative of potential exposures and lacking in obvious correlation to protected classes.

Note that reviewing source details should not make a difference when the model is new or refreshed; refreshed models would report the prior version list with the incremental changes due to the refresh. |

| 1 |
### Information Element B.1.f

**Identify the model’s target variable.**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A clear description of the target variable is key to understanding the purpose of the model. It may also prove useful to obtain a sample calculation of the target variable in Excel format, starting with the “raw” data for a policy, or a small sample of policies, depending on the complexity of the target variable calculation.</td>
</tr>
</tbody>
</table>
THE FILED RATING PLAN - General Impact of Model on Rating Algorithm

Information Element C.1.c:

Obtain a complete list of characteristics/variables used in the proposed rating plan, including those used as input to the model (including sub-models and composite variables) and all other characteristics/variables (not input to the model) used to calculate a premium. For each characteristic/variable, determine if it is only input to the model, whether it is only a separate univariate rating characteristic, or whether it is both input to the model and a separate univariate rating characteristic. The list should include transparent descriptions (in plain language) of each listed characteristic/variable.

Examples of variables used as inputs to the model and used as separate univariate rating characteristics might be criteria used to determine a rating tier or household composite characteristic.
Drafting Issues Addressed

- Rational explanation.
- Confidentiality of model information.
- Importance of information elements needed for review (GLM).
- Lines of business.
- Non-GLM models.
Latest White Paper draft was exposed June 12, 2020 through July 27, 2020.

CASTF will evaluate comments received.

CASTF will make changes, as needed, and forward White Paper to C Committee (September 2020).
ACCELERATED UNDERWRITING (A) WORKING GROUP
Description of the Project, Issues Addressed, etc.

- Charge and AUWG created by A Committee at 2019 Summer National Meeting
  - Charge to “Consider the use of external data and data analytics in accelerated life underwriting, including consideration of the ongoing work of the Life Actuarial (A) Task Force on the issue and, if appropriate, drafting guidance for the states.”
- AUWG held first conference call Oct 2, 2019.
AUWG members

Illinois: Chair
Minnesota: Vice Chair
Other members: Colorado, Iowa, Louisiana, Missouri, Nebraska, North Dakota, Ohio, Rhode Island, Washington, and Wisconsin
Work Plan

- Three Phases:
  I – Information Gathering
  II - Identify Issues and Potential Work Product
  III - Develop Work Product
Process

The AUWG has met 16 times (via conference call and in person).

- Once in Oct. 2019 (10-2-19)
- Once in Dec. 2019 (12-8-19)
- Twice in Jan. 2020 (1-23-20; 1-30-20)
- Four times in Feb. 2020 (2-6-20; 2-13-20; 2-20-20; 2-27-20)
- Twice in Mar. 2020 (3-5-20; 3-13-20)
- Twice in June 2020 (6-18-20; 6-25-20)
- Four times in July 2020 (7-8-20; 7-16-20; 7-23-20; 7-31-20)

Six of the 15 sessions have been regulator-only; the rest have been open presentations.
PRESENTATIONS FROM:

- Actuarial consulting firms (Deloitte, Milliman, Risk Regulatory Consulting)
- American Academy of Actuaries
- Life insurance companies
- Consumer advocate group (Center for Economic Justice)
- Lawyers (Foley & Lardner, Edelson PC)
- Machine Learning Assurance Company (Monitaur)
NEXT STEPS—Ad Hoc Subgroups

- The “Ad Hoc NAIC Liaison Subgroup” will focus on making sure the AUWG is aware of all other NAIC groups, past and present, including any work products developed or in progress in those groups.

- The “Ad Hoc Drafting Subgroup” will focus on identifying the issues, synthesizing the information received and make a recommendation to the Working Group about a work product. This drafting subgroup will also propose a process for developing that work product.
Proposed Revised TIMELINE

- August – early September: Final presentations to fill gaps, including the pros and cons of machine learning as well as hands-on auditing of AUW programs.
- August – December: Ad Hoc Drafting Group to decide on work product and begin drafting while coordinating with the Ad Hoc NAIC Liaison Group to ensure consistency with other NAIC work streams.
- End of December 2020: Have a first draft to expose for comment.
- Final Work Product to the (A) Committee by 2021 Summer National Meeting.
Questions?