Review of Data and Analysis for the 2018 Public Utilities Board Automobile Insurance Review

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Purpose:
To provide an assessment of the data collected and analyzed for the Public Utilities Board's 2018 study into insurance rates in Newfoundland and Labrador.

Author Credentials:
I have a PhD in Political Science from McGill University with expertise in methodology. I have taught courses in research methods at both the undergraduate and graduate level that include instruction on data collection, polling and questionnaire design, bias, and quantitative analysis. Beside conducting peer-review for many top journals in my discipline, I have also published multiple peer-reviewed articles and 1 peer-reviewed book manuscript employing extensive use of quantitative analysis.

Preamble:
Three key elements of assessing data collection and analysis are bias, efficiency, and consistency. Of particular importance in the current assessment is the issue of bias, which "...occurs when there is a systematic error in the measure that shifts the estimate more in one direction than another...". [1] The desired result of credible, objective research that depends upon a sample of observations is representativeness – meaning that the full population of existing cases is accurately reflected by the sample of cases provided.[2] Bias leads to results that deviate from representativeness, and can be both intentional and unintentional in form.[3]

Intentional bias usually derives from a researcher who hopes for a particular finding (i.e. who is willing to forego representativeness) and uses the process of collection and analysis to attain research results that produce the desired finding. Unintentional bias can be entirely unknown to a researcher, and is possible even where representativeness is desired. An example of the latter might be where data on vehicle accidents is collected from a single year in which the winter for that year was particularly bad weather-wise. This might cause the number of accidents to be biased in an upward direction, and therefore not representative of the number of accidents across all years. Bias may also result when a researcher requests

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[1] King, Gary, Robert O. Keohane, and Sidney Verba. 1996. *Designing Social Inquiry.* Princeton University Press. Page 63.
[2] Babbie Earl, and Lucia Benaquisto. 2013. *Fundamentals of Social Research*. *3rd Cdn ed*. Page 169.
[3] Frankfort-Nachmias, Chava, David Nachmias, and Jack DeWaard. 2015. *Research Methods in the Social Sciences. 8th ed.* New York: Worth Publishers. Page 179.

information in a non-biased manner, but a respondent provides what they see as a desirable response or one that reacts to the researcher (i.e. this is often seen in survey/interview research where gender or race of the interviewer affects responses of the interviewee). If a single person is called upon to categorize events, any potential preference or misunderstanding could lead to bias in categorizations.

The best means of guarding against intentional bias is by engaging a dis-interested party in the collection and/or verification of data. Unintentional bias typically requires additional steps to detect and correct. One such process is intercoder-reliability[4], where two or more data collectors code the same events/cases and then the two (or more) sets of coded data are compared to ensure that there is a high degree of similarity in how cases were categorized between coders.

Ideally, processes to minimize bias will be used as a standard where relevant. In cases where public bodies must make decisions based upon data and analysis provided by outside sources, it would set a problematic precedent to require such bodies to determine on their own if bias exists, especially where processes to guard against such bias are available.

Assessment of Data and Analysis:
Having reviewed the available documents, there are identifiable problems with the collected data and with the analysis of them. These problems can be attributed to 4 areas: (1) potential bias introduced by collectors of the data, (2) potential error or bias based on method of collection and data exclusion, (3) potential bias in the data, (4) potential bias in the analysis.

1. Potential bias introduced by collectors of the data
The data collection and training are each overseen by the Insurance Bureau of Canada. The data themselves are not independently audited and therefore all references to the accuracy of the data in the analysis phase (conducted by Oliver Wyman) include a reference to assuming the data are accurate. As the IBC is also actively lobbying the PUB in its submission to adopt a particular outcome, this identifies them as an interested party. It seems inappropriate to use data supplied solely by IBC without independent verification.

IBC identifies the rigorous schedule as not permitting them to reach data targets or to conduct verification in completing the data collection process. (Page 3, Closed Claim Study Instructions).

Note that a previous closed case study conducted for the PUB in 2005 used an independent firm to validate collected data.

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[4] Frankfort-Nachmias, Chava, David Nachmias, and Jack DeWaard. 2015. *Research Methods in the Social Sciences. 8th ed.* New York: Worth Publishers. Page 294.

2. Potential error or bias based on method of collection and data exclusion
The questionnaire used for classification depends upon subjective categorization of previously collected data. Categorization is made using retrospective judgment. This would typically tend to increase random error compared to categorization in real time. As there was no access to each company's documents by IBC, or intercoder-reliability tests on coding, there is no way of ensuring that the provided data are reliable. Further, as there is an interest in a particular outcome among those providing data, it is also possible that this would lead to bias in responses rather than simply greater error (i.e. that marginal cases would tend to be placed in a desired category, rather than being randomly distributed in categories).

Further, it is reported that 236 cases were not included in the data analysis, but there is no means by which to verify if the excluded data would likely have the same attributes as the remaining data (Page 2, OW Closed Claim Study Summary). While any exclusion of data always increases the potential error in estimates using the remaining data, it is also important to know if the excluded data can be assumed to be random. Otherwise, the exclusion may introduce bias.

3. *Potential bias in the data*
In IBC's Closed Case Study instructions, it is stated: "It is assumed that the average TPL-BI claims duration from the date of accident to the claim closure date is approximately four to five (4 - 5) years, so the majority of the selected claimants should have their accident dates in 2012" (Page 5). However, the majority of claims fall in the years 2014 and 2015 (1001 cases, or 57%) with 2015 being the modal category among all years (Page 18, OW Closed Claim Study Summary). This may indicate that the analysis is conducted with a non-representative sample, given that it does not fit expected parameters.

4. *Potential bias in the analysis*
The analysis provided by Oliver Wyman uses a range of proportions of claims determined likely to fit the "minor" classification in order to calculate potential savings under different scenarios. However, the range determined (66%-76%) is not directly based upon injury definitions applied to cases, but rather the upper limit is determined simply using cost and proportion of claims (Page 14, OW Minor Injury Reform Cost Estimates). No justification is provided for the determination of using average cost within a given set of injury categories as a logical cut-off. While this determination is not conducted by an interested party, the lack of justification in the form of definition of injuries or expertise suggests the estimate may not be reliable.

This range can be compared with the assessments of injury by insurance companies themselves. Recognizing that the reporting is not verified independently, only 54% of cases had injuries deemed "minor" while 26% were deemed unknown. The employed range of 66%-76% suggests an assumption that 17% plus/minus 5% of

these 26% unknown cases would be deemed minor. In other words, it is assumed that – on average - far more of the unknown cases are minor than are not. Again, there is no justification for this assumption and it appears to indicate bias in the direction of inflating the number of cases fitting the "minor" definition.

Further, it is noted that the submission by Intact Insurance employs that company's own study over the period 2011-2015. In it, Intact identifies only 55% (213 of 388) of cases as fitting the minor injury categorization (Page 4, Intact Financial Corporation).

Public Utility Board hearings:

In hearings held on June 5 through June 8, Paula Elliot was questioned on Oliver Wyman's analysis and use of data. On June 12, Amanda Dean and Ryan Stein were questioned on the data collected by the Insurance Bureau of Canada. A few key points should be made with regard to these exchanges.

The matter of independence and accuracy with the provided data arises a number of times during exchanges before the Board (examples include those with Colin Feltham, Jerome Kennedy and Barry Mason). The Board is essentially being asked to determine the independence of the IBC (both the data collector as well as an advocate for the insurance industry) and Oliver Wyman in these exchanges. While it is not certain that intentional and/or unintentional bias necessarily exists or does not exist within the data collection or analysis, the main problem identified is that proper and accepted practices were not followed to avoid these questions in the first place. The Board should not be called upon to render a judgment on whether groups with an interest in the outcome of the Board's decisions can provide neutral data and analysis.

The problem from a policy perspective is that the Board, as a public body primarily accountable to citizens and ratepayers, is placed in a position of making a decision based upon poor processes. The integrity of the Board for both the current and future matters should require a precedent of following accepted rules for data collection and analysis.