Risks in Assumptions in Onboarding Reinsurance

Presented to: Southeast Actuarial Club

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November 2024

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Innovations in Managing Mortality Risk

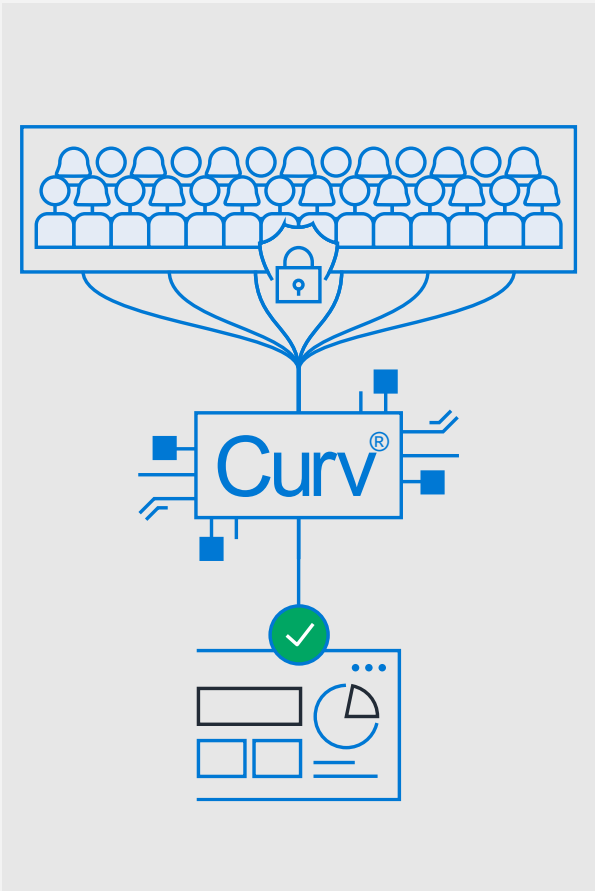**Aside from traditional mortality studies, what are companies doing to manage mortality risk?**

Pricing under combination of various assumptions
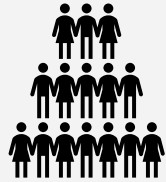
Monte Carlo Simulation of results

Risk Scores (ex. Curv® Inforce)

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Curv® Inforce
Educational Introduction

Allows insight into the risk of group or cohort

No HIPAA authorization required, so no PHI

Results need to preserve the de-identification

Uses de-identified health histories to calculate a risk score

Required information:

- First & Last Name
- Date of Birth
- Gender
- Zip Code

## Holistic multi-variate model

Predicts relative mortality

Developed using Milliman's 42 million-life mortality study

- 235M Life years
- 1.9M Deaths
- Application years: 2005-2020

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Example 1: Agent Monitoring

➤ A simplified issue carrier suspects some agents produce more profitable business than others

➤ Traditional mortality studies aren't very conclusive due to lower claim credibility.

Average Risk Score by Agent

Overall Average 0.86
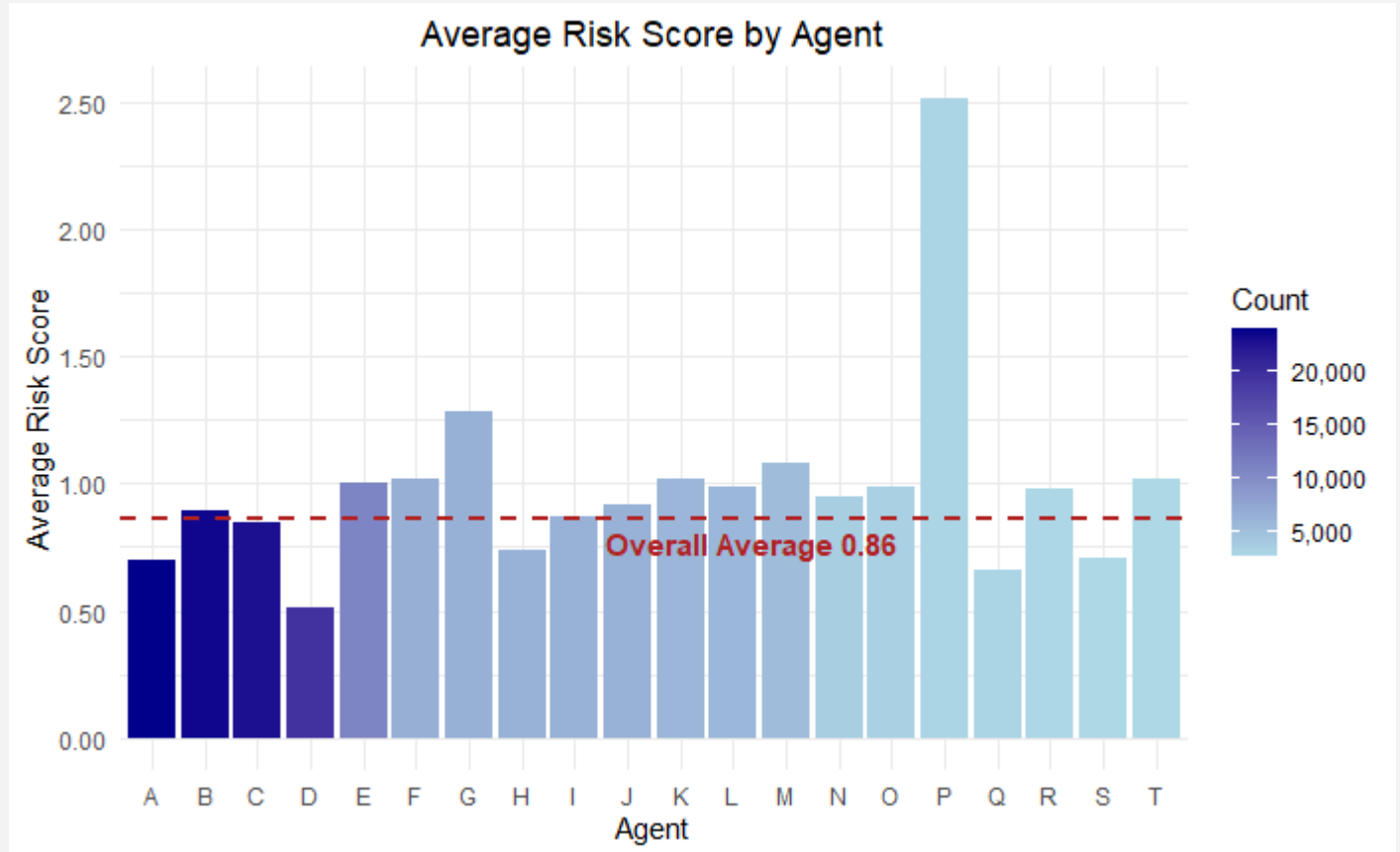
Example 2: Managing Exceptions in Worksite Market

- ➤ Typically Guarantee Issue (GI)
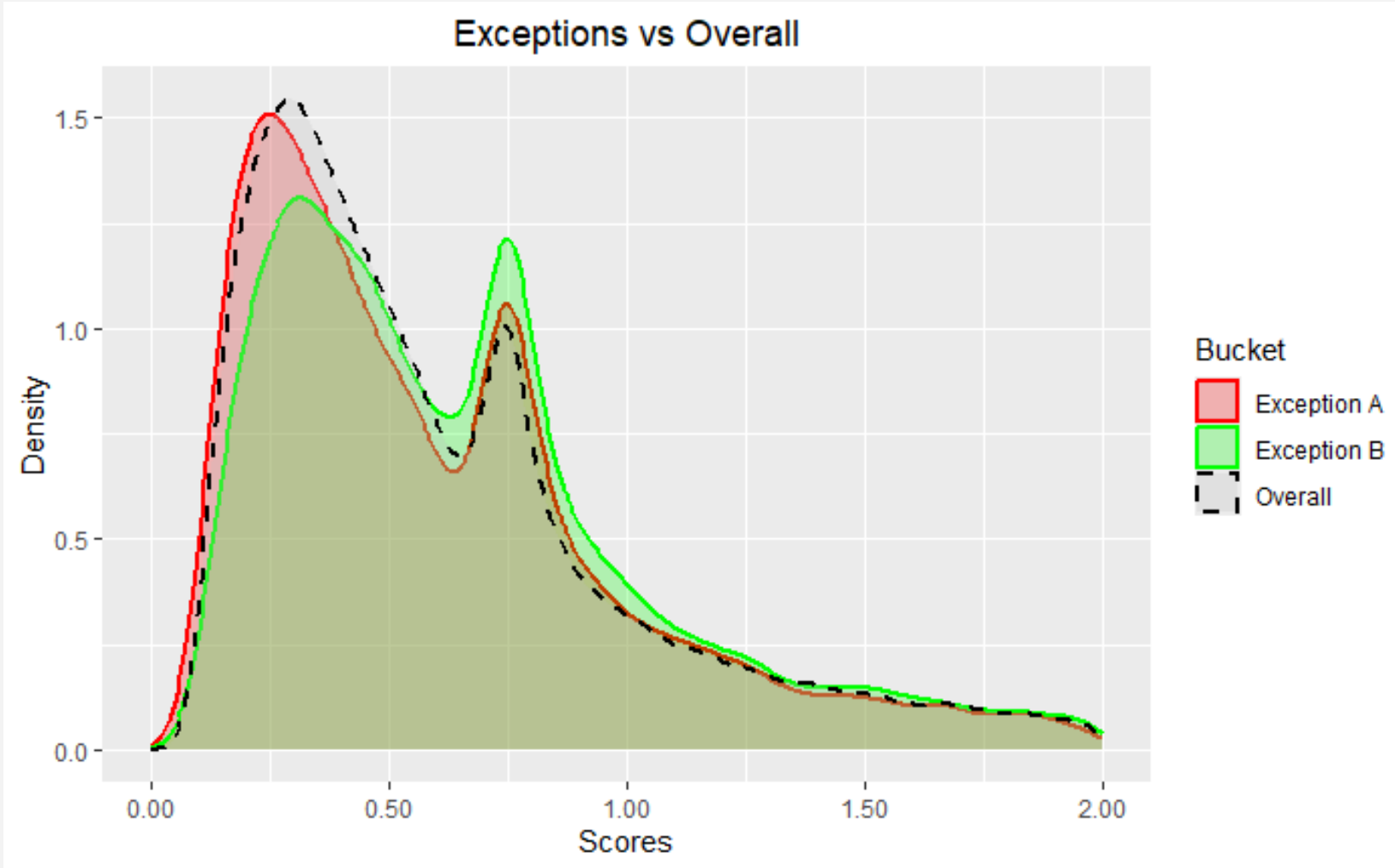- ➤ Most risk management decisions at group-level

Market pressures demand group "exceptions" that could expose carriers to higher mortality risk:

- ➤ Higher GI limits
- ➤ Dependent GI
- ➤ Re-enrollment GI
- ➤ Waive participation requirements
- ➤ Higher risk industries

- ➤ Carrier has made limited exceptions
- ➤ Will likely take at least 5-10 years for experience to emerge

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Example 2: Worksite Life - Risk Score Data

Exceptions vs Overall

Density plot with Scores on x-axis (0.00 to 2.00) and Density on y-axis (0.0 to 1.5).

Bucket:
- Exception A (red)
- Exception B (green)
- Overall (black dashed)

Curv Scores

Cohort	25th Percentile	Median	75th Percentile
Exception A	0.31	0.55	0.89
Exception B	0.37	0.63	0.96
Overall	0.32	0.54	0.90

Relative to Overall

Cohort	25th Percentile	Median	75th Percentile
Exception A	97%	102%	99%
Exception B	116%	117%	107%
Overall	100%	100%	100%

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Example 3: Background

Carrier calculates ULSG statutory reserves on a principles-based framework, with two similar business cohorts:
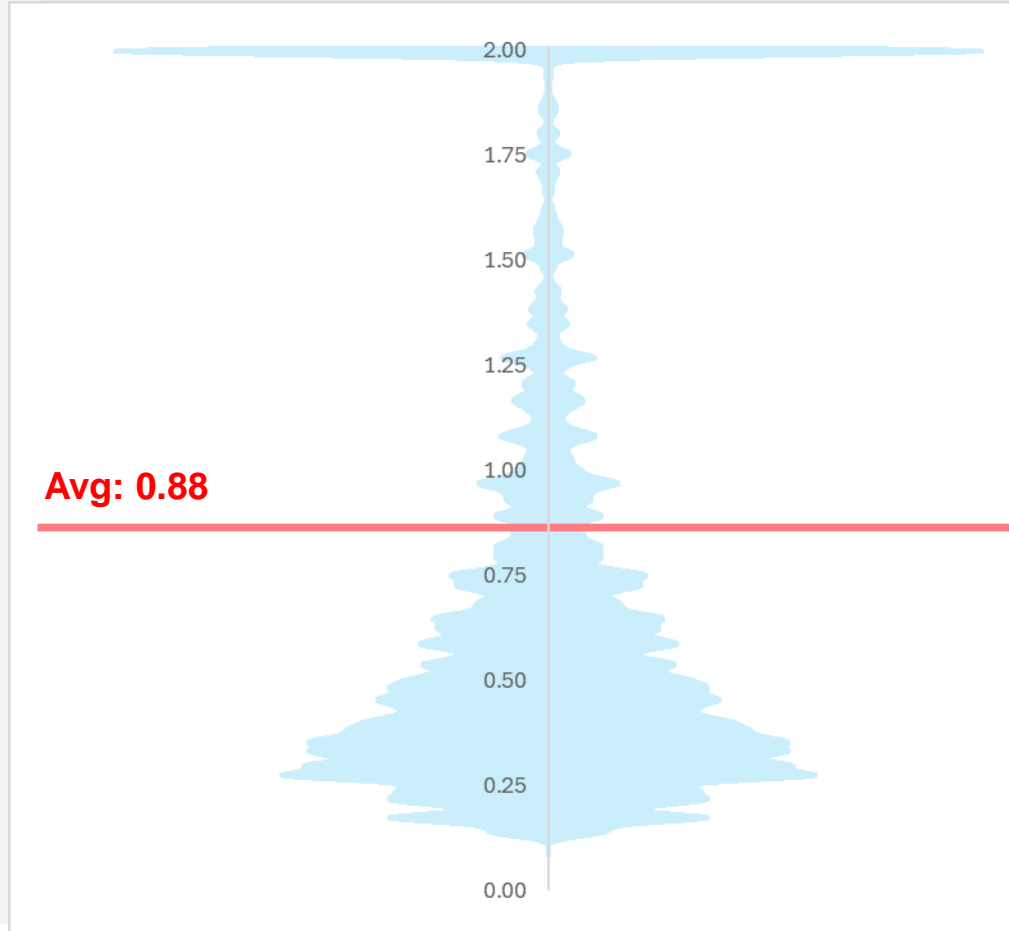
➢ Cohort A

➢ Cohort B

Cohort A

➢ Mortality assumption based upon a robust traditional mortality study
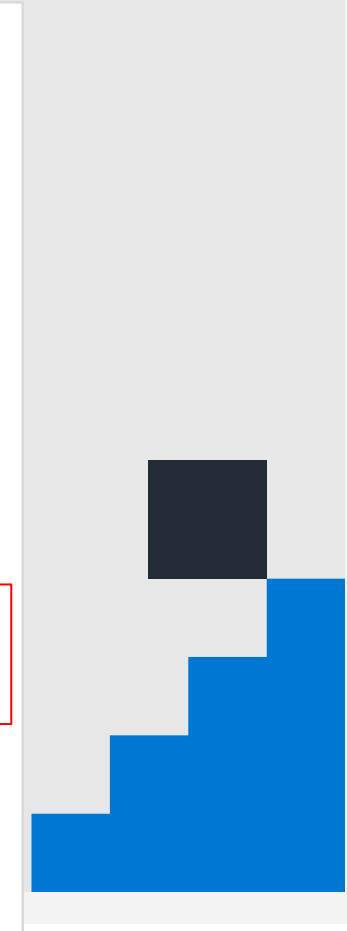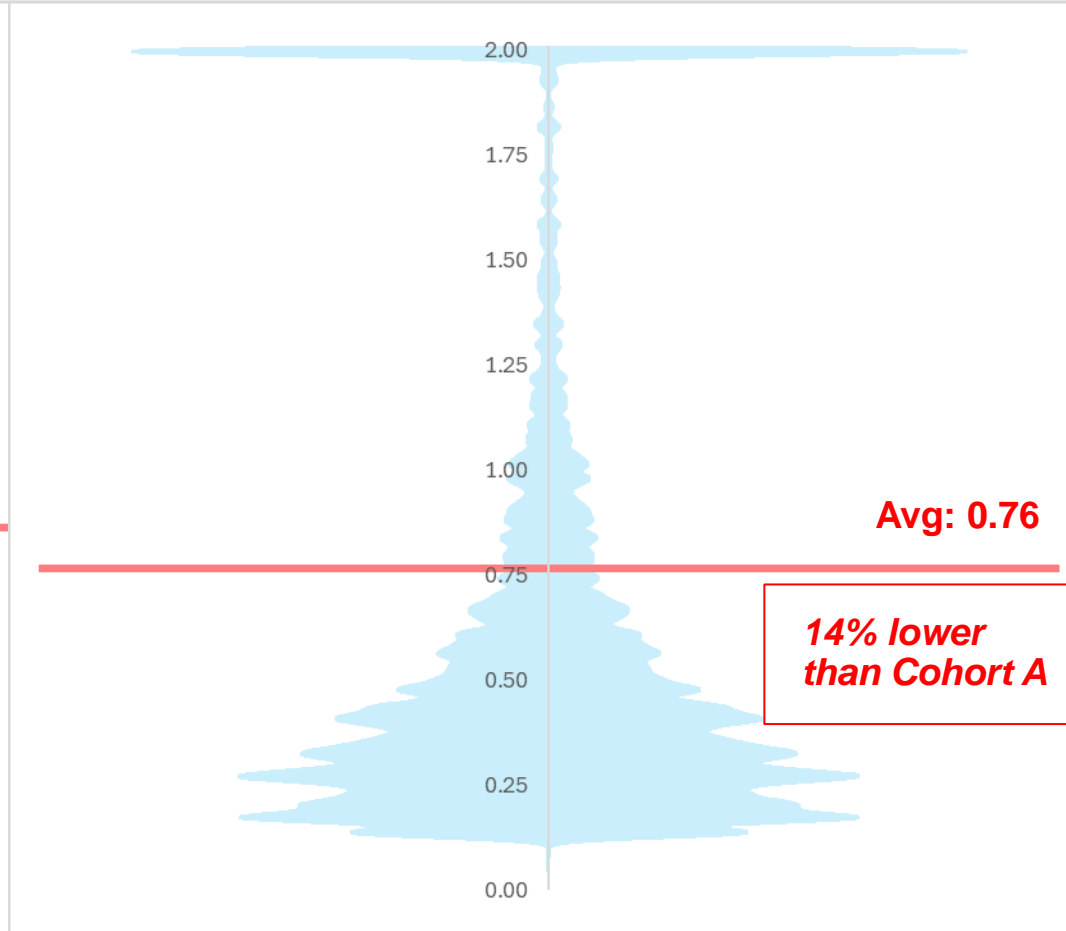
Cohort B

➢ No mortality study available

➢ Likely has <u>lower</u> mortality risk than Cohort A

➢ Mortality assumption is set equal to Cohort A mortality for conservatism

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Example 3: ULSG Risk Score Data

Cohort A

Cohort B

Avg: 0.88

Avg: 0.76

14% lower than Cohort A

Other Examples of Curv® Inforce Usage

High-level use cases

Compare different cohorts

- Blocks of business
- Distribution groups or marketing campaigns
- Agent and underwriter monitoring

Experimentation

- New market
- New initiative
- New underwriting regime

Inforce Management

- Post-level term and term conversions
- Non-guaranteed elements
- Experience study enhancement

Reinsurance

- Strategic use of reinsurance by direct carriers
- Enhancing experience for reinsurers

Principle-Based Reserves

- Best-estimate assumptions
- Accelerated Underwriting Programs

Simplified Issue/Guaranteed Issue

- Measuring exposure
- Underwriting evaluation

Questions/Discussion

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