COVID-19 Mortality Modeling Survey
Summary of Results
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COVID-19 Mortality Modeling Survey
Summary of Results

Section 1: Introduction

The Society of Actuaries (SOA) has partnered with LIMRA, Oliver Wyman, and the American Council of Life Insurance (ACLI) to conduct a series of ‘sprint’ surveys on the coronavirus (COVID-19) pandemic and its potential impacts on the U.S. life insurance industry. This report contains a summary of the results of the first survey on best practices in monitoring and modeling the potential impact of COVID-19 mortality on life insurance industry claims. The survey was directed at actuaries and/or risk management staff of insurers and reinsurers in the U.S. and Canada. Fifty-three companies responded to the survey. Highlights of the survey responses are found in Section 2 and a summary of results for each question in the survey is found in Section 3.
Section 2: Survey Highlights

This survey covers four topics related to COVID-19 mortality: modeling, scenarios, claims/impact, and data/communication.

**Modeling:** Most respondents (85%) report modeling COVID-19 mortality scenarios. The top two factors incorporated in modeling are age and infection rates and case fatality rates, which are used by more than half of respondents. Many respondents also report incorporating time period and geography in their models.

**Scenarios:** When asked about their view of the ultimate number of COVID-19 deaths for 2020 in the U.S. population, a plurality of respondents expect 100,000 to 250,000 deaths in a baseline scenario and 1 million to 5 million deaths in a worst case scenario.

For U.S. infection rates for 2020, a plurality of respondents expect a <15% infection rate in a baseline scenario and a 25-50% infection rate in a worst case scenario. Infection rates are not expected to vary significantly across age groups; however, respondents do expect differences by age for case fatality rates (CFR).

Most respondents expect the CFR will be <0.5% for ages under 40, 0.5%-2.5% for ages 40-60, 2.5%-10% for ages 60-80, and 5%-15% for ages 80+ in a baseline scenario. In a worst case scenario, most respondents still expect the CFR will be <0.5% for ages under 40, 0.5%-2.5% for ages 40-60, 5%-10% for ages 60-80, and >15% for ages 80+.

**Claims / Impact:** About two-thirds of respondents don’t know or don’t track the percentage of influenza/pneumonia claims relative to total claims. Of those who do have this information, 80% reported that influenza/pneumonia deaths make up less than 5% of total claims. For COVID-19 mortality claims, most respondents expect a larger increase for individual life claims (>10%) vs. group life claims (1%-5%).

The survey requested information on the quintile level of household income of their policyholders. Given that mortality levels tend to vary with socio-economic status, knowing this information may be useful in benchmarking future mortality against population mortality statistics. About 40% of the responses were ‘did not know’; the remaining responses varied, indicating socio-economic diversity across companies.

Respondents report a range of views on the potential impact of COVID-19 on reinsurance: about a third are not worried about reinsurance in light of COVID-19, while about a quarter are worried about reinsurer financial health or changes in underwriting standards for what reinsurers will accept.

**Data / Communication:** Respondents report using a wide range of information sources to support COVID-19 efforts; >80% are using government data sources, with more than half using academic studies, or vendor consultation.

Many survey respondents report daily updates to senior management, monthly board updates, and ad hoc updates with regulators and rating agencies. Questions from these stakeholder groups are often focused on COVID-19’s impact on financial health, modeling efforts, and policyholder behavior.
Section 3: Mortality Modeling Survey Questions and Response Detail

3.1 FROM WHAT PERSPECTIVE ARE YOU RESPONDING TO THIS SURVEY?

*Other includes Chief Actuaries, Risk Management, Experience Studies, and Assumption Setting Functions

3.2 IS YOUR COMPANY MODELING COVID-19 MORTALITY SCENARIOS?
3.3 WHAT FACTORS ARE YOU INCORPORATING IN MODELING COVID-19 MORTALITY SCENARIOS?
(SELECT ALL THAT APPLY)

3.4 RANK THE FACTORS YOU ARE INCORPORATING IN MODELING COVID-19 MORTALITY SCENARIOS IN ORDER OF IMPORTANCE TO THE MODEL RESULTS.
(CHART INDICATES THE NUMBER OF COMPANIES THAT RATED THE GIVEN FACTOR IN THE TOP 3 IN TERMS OF IMPORTANCE.)
3.5 WHAT IS YOUR VIEW OF DEATHS IN A BASELINE SCENARIO? [TOTAL US POPULATION]


![Bar Chart]

3.6 WHAT IS YOUR VIEW OF DEATHS IN A WORST CASE SCENARIO? [TOTAL US POPULATION]


![Bar Chart]
3.7 WHAT IS YOUR VIEW OF INFECTION RATES IN A BASELINE SCENARIO? [TOTAL US POPULATION]


![Bar chart showing infection rates for different age groups in a baseline scenario.]

3.8 WHAT IS YOUR VIEW OF INFECTION RATES IN A WORST CASE SCENARIO? [TOTAL US POPULATION]


![Bar chart showing infection rates for different age groups in a worst case scenario.]

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3.9 WHAT IS YOUR VIEW OF CASE FATALITY RATES IN A BASELINE SCENARIO? [TOTAL US POPULATION]

3.10 WHAT IS YOUR VIEW OF CASE FATALITY RATES IN A WORST CASE SCENARIO?
3.11 WHAT % OF YOUR LIFE INSURANCE MORTALITY CLAIMS ARE DUE TO INFLUENZA/PNEUMONIA IN A TYPICAL YEAR?

ASSUME A TYPICAL YEAR OCCURS 90% OF THE TIME AND CLAIMS ARE IN TERMS OF THE # OF POLICIES

![Histogram showing the distribution of claims due to influenza/pneumonia by percentage.]

3.12 WHAT IS YOUR COMPANY’S CURRENT VIEW ON THE APPROXIMATE IMPACT OF COVID-19 ON YOUR COMPANY’S 2020 INDIVIDUAL LIFE INSURANCE MORTALITY CLAIMS?

ASSUME % INCREASE IN DEATH CLAIMS IN DOLLARS OVER 2019

![Histogram showing the distribution of estimated increase in death claims due to COVID-19.]

Includes all companies with individual life insurance mortality risk.
3.13 WHAT IS YOUR COMPANY’S CURRENT VIEW ON THE APPROXIMATE IMPACT OF COVID-19 ON YOUR COMPANY’S 2020 GROUP LIFE INSURANCE MORTALITY CLAIMS?
ASSUME % INCREASE IN DEATH CLAIMS IN DOLLARS OVER 2019

![Bar chart showing the percentage increase in death claims in dollars over 2019.]

3.14 ON AVERAGE, WHAT IS THE HOUSEHOLD INCOME LEVEL RANGE FOR YOUR LIFE INSURANCE POLICYHOLDERS?
[RESPONSES IN TERMS OF PERCENTILE – US POPULATION]

![Bar chart showing the household income percentile groups.]

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3.15 WHICH OF THE FOLLOWING BEST DESCRIBES YOUR COMPANY’S BIGGEST CONCERN RELATED TO COVID-19 AND REINSURANCE?

3.16 WHAT INFORMATION SOURCES ARE YOU USING TO INFORM YOUR COMPANY’S COVID-19 MORTALITY ESTIMATES?

(SELECT ALL THAT APPLY)
3.17 HOW FREQUENTLY ARE YOU PROVIDING UPDATES TO KEY STAKEHOLDER GROUPS REGARDING PREPAREDNESS FOR COVID-19 MORTALITY IMPACTS?

![Bar chart showing the frequency of updates to key stakeholders regarding COVID-19 mortality impacts.](chart)

- **Senior management**
  - Daily: 22
  - Weekly: 19
  - Monthly: 8
  - Other: 3

- **Board**
  - Daily: 14
  - Weekly: 16
  - Monthly: 22
  - Other: 8

- **Regulators**
  - Daily: 4
  - Weekly: 8
  - Monthly: 40
  - Other: 8

- **Rating agencies**
  - Daily: 44
Section 4: Acknowledgments

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About The Society of Actuaries

With roots dating back to 1889, the Society of Actuaries (SOA) is the world’s largest actuarial professional organizations with more than 31,000 members. Through research and education, the SOA’s mission is to advance actuarial knowledge and to enhance the ability of actuaries to provide expert advice and relevant solutions for financial, business and societal challenges. The SOA’s vision is for actuaries to be the leading professionals in the measurement and management of risk.

The SOA supports actuaries and advances knowledge through research and education. As part of its work, the SOA seeks to inform public policy development and public understanding through research. The SOA aspires to be a trusted source of objective, data-driven research and analysis with an actuarial perspective for its members, industry, policymakers and the public. This distinct perspective comes from the SOA as an association of actuaries, who have a rigorous formal education and direct experience as practitioners as they perform applied research. The SOA also welcomes the opportunity to partner with other organizations in our work where appropriate.

The SOA has a history of working with public policymakers and regulators in developing historical experience studies and projection techniques as well as individual reports on health care, retirement and other topics. The SOA’s research is intended to aid the work of policymakers and regulators and follow certain core principles:

**Objectivity:** The SOA’s research informs and provides analysis that can be relied upon by other individuals or organizations involved in public policy discussions. The SOA does not take advocacy positions or lobby specific policy proposals.

**Quality:** The SOA aspires to the highest ethical and quality standards in all of its research and analysis. Our research process is overseen by experienced actuaries and non-actuaries from a range of industry sectors and organizations. A rigorous peer-review process ensures the quality and integrity of our work.

**Relevance:** The SOA provides timely research on public policy issues. Our research advances actuarial knowledge while providing critical insights on key policy issues, and thereby provides value to stakeholders and decision makers.

**Quantification:** The SOA leverages the diverse skill sets of actuaries to provide research and findings that are driven by the best available data and methods. Actuaries use detailed modeling to analyze financial risk and provide distinct insight and quantification. Further, actuarial standards require transparency and the disclosure of the assumptions and analytic approach underlying the work.
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