RGA

Individual Life Insured Mortality Trends

Examining “pulled-forward” deaths during the COVID-19 pandemic

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Individual Life Experience During the Pandemic

Study details and considerations

- More than 30 companies
- Collaboration between the SOA, LIMRA, RGA and TAI
- Nearly 3 million claims
- Spans January 2015 through September 2021
- Count basis
- Focus on fully underwritten policies

Individual Life Experience During the Pandemic

Excess Deaths by Cause

Challenges tied to cause of death studies:

- Causes can look too volatile to decipher meaning
  - Seasonality
  - Sparse data
- Unknown causes
  - Depending on the age group, product type, underwriting method, etc., we may have 15% to over 50% of deaths with no cause given
- Meaningful assignation of causes to groups
- Interpreting results when a brand new and significant cause (COVID-19) is introduced

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Excess Deaths by Cause

- Causes can look too volatile to decipher meaning
  - Seasonality
    - Use monthly results
    - Remove flu/pneumonia when looking at trends
  - Sparse data
    - To be included, our results average at least 2 deaths per day per cohort through the entire study
- Unknown Causes
  - We reduce the percentage of claims with no cause by using only fully underwritten claims in this analysis
  - Scale up known causes within a cohort by the outstanding unknown percentages

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Excess Deaths by Cause

- Meaningful assignation of causes to groups
  - 30+ companies with different reporting
  - Developed “lowest common-denominator” approach
    - Resulted in 16 causes including COVID-19
- Interpreting results when a brand new and significant cause (COVID-19) is introduced
  - Develop age-standardized mortality rates (ASMR) for each cause within a cohort
  - Trend the ASMRs and compare the new results against the trend

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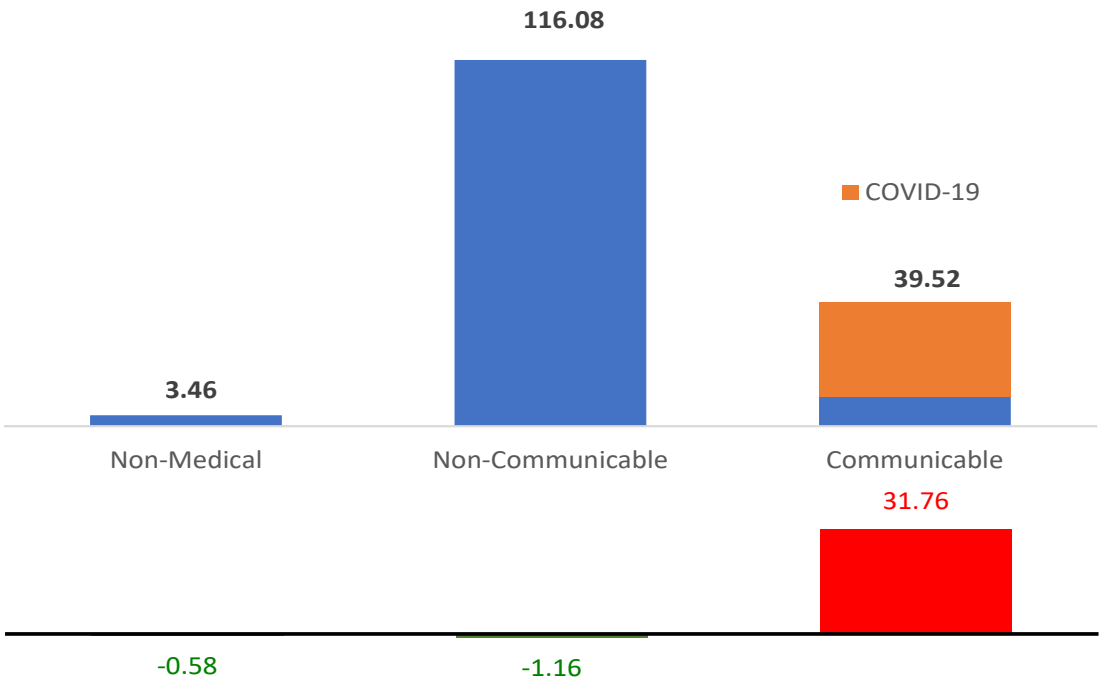
Actual and expected results by cause group

Total ASMR (upper columns) and ASMR minus Expected ASMR (lower columns), ages 85+, Q4 2020



In Q4 2020 for ages 85+:

- The total excess was 30.02
  - 23% over expected
- COVID contributed 30.17
- Excess / COVID ratio = 1.00

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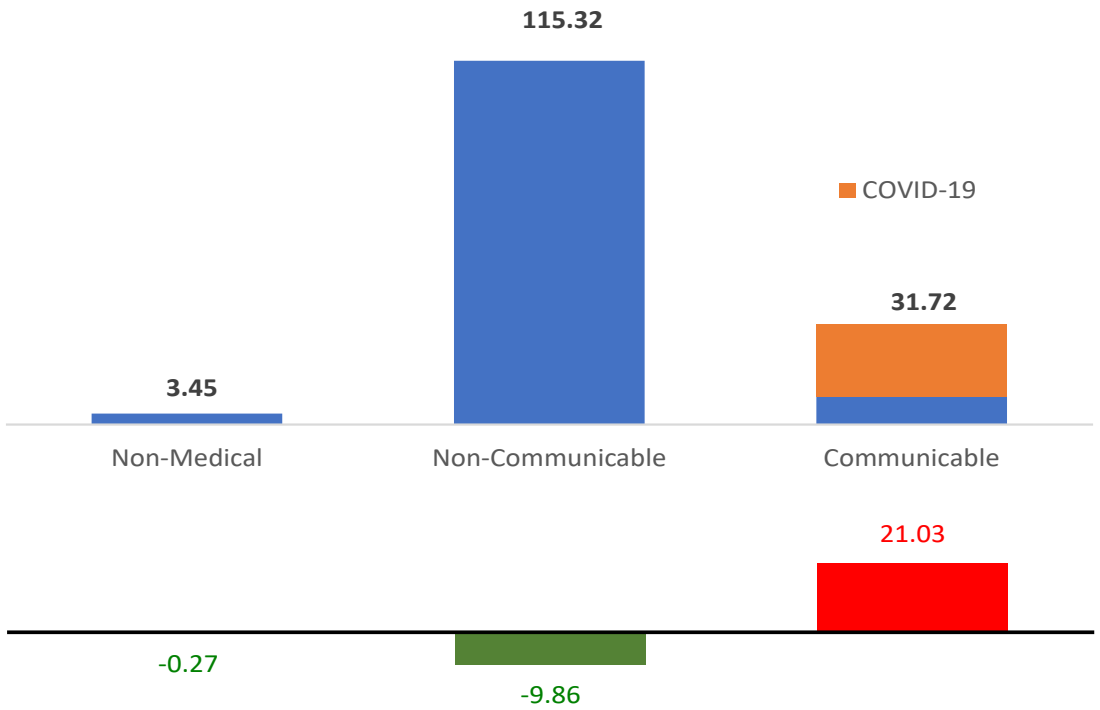
Actual and expected results by cause group

Total ASMR (upper columns) and ASMR minus Expected ASMR (lower columns), ages 85+, Q1 2021



In Q1 2021 for ages 85+:

- The total excess was 10.91
  - 7.8% over expected
- COVID contributed 22.90
- Excess / COVID ratio = 0.48
- Largest decrease was to cardiovascular deaths (-6.19 ASMR)

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“Pulled-Forward” Deaths

The ensuing period of non-COVID deaths falling below trend is evidence of pulled-forward deaths – deaths that may have been imminent but happened in an accelerated time frame due to the high magnitude COVID deaths in the prior time frame

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Studying “Pulled-Forward” Deaths

- Study characteristics:
  - Monthly ASMRs for each cohort by cause
    - Minimum average 2 deaths per day per cohort over 2015-2021
  - Divided US into 10 regions
  - 5-year age bands from 50-54 up to 90-94, then 95+ (10 groups total)
- Cohorts for study
  - Of the 10 Regions * 10 Age Groups * 21 Months = 2,100 months available
    - 1,722 months qualified for study

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Studying “Pulled-Forward” Deaths

- Excess monthly deaths from COVID are calculated as a percentage of overall expected deaths and bucketed into groups, from 0-5% excess from COVID, incrementally up by 5% until 40%+ excess from COVID for the highest group
- The average quarterly, lagged non-COVID, non-flu excess* is calculated, and results can be regressed against that cohort’s earlier COVID excess to approximate a relationship of COVID deaths to overall excess deaths
  - * This “excess” result can be negative which would be evidence of pulled-forward deaths

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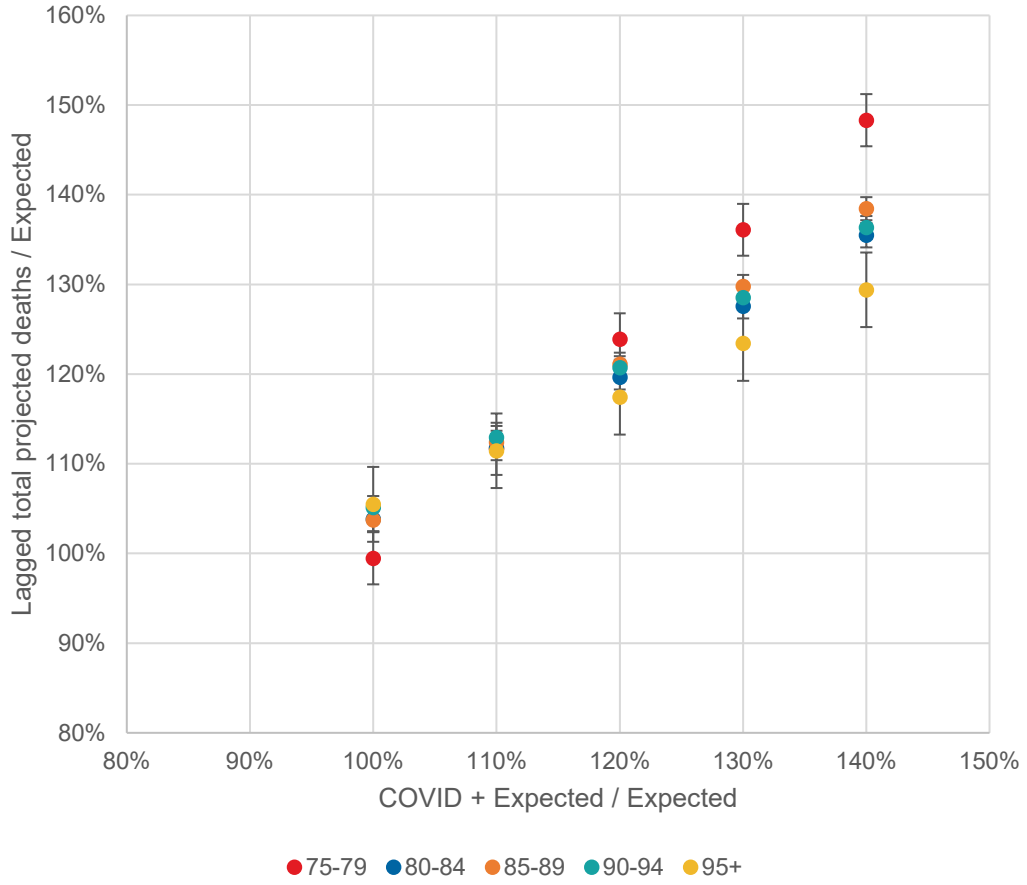
Studying “Pulled-Forward” Deaths



- The expected excess for the youngest age group (75-79) exceeds COVID when COVID deaths are higher
- The expected excess for the three middle age groups are below the COVID deaths following high-magnitude periods of COVID deaths, and exceeds COVID deaths following lower magnitude periods
- The expected excess for the oldest age group (95+) falls well below the COVID deaths

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Studying “Pulled-Forward” Deaths

- There appear to be two main drivers of the result
  - Age: The impact seems greater at the oldest ages
  - Magnitude of COVID: In the age 80-94 set the threshold for seeing *consistently* pulled-forward deaths in the subsequent immediate aftermath is around 30% excess from COVID
    - This is a number that has not occurred on a sustained level to the entire nation

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Studying “Pulled-Forward” Deaths

- Any COVID death may be argued to be a pulled-forward death, but the immediate recognition only impacts certain cases where the deceased is quite old or when the magnitude of COVID was substantial enough to reach more at-risk individuals
- The AIDS and opioid epidemics also pulled thousands of deaths forward, but with less instantaneous recognition of the phenomena because of the relatively younger ages of the deaths

Individual Life Experience During the Pandemic

Thank you and links

- The SOA Research Institute houses the links to all studies we have produced from the individual life experience study at this location:

  https://www.soa.org/resources/research-reports/2020/impact-coronavirus/

  - Experience study results
  - Population comparisons
  - Downloadable dashboards
  - Cause of death analyses
  - Reported claims analyses
- We want actuaries to have the best information to make decisions!
  - This is not a simple cataloging of COVID history; we tried to make it useful