

How Might Pandemic Flu Affect U.S. Life Insurers?

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What is Pandemic Flu?

- Epidemic: outbreak of infectious disease throughout geographic region
- Pandemic: global epidemic
- Flu: disease caused by influenza virus
- 3 Influenza pandemics in 20th century
 - 1918 Spanish Flu
 - 1957 Hong Kong Flu
 - 1968 Asian Flu

Risk for Life Insurers

- Weisbart (III) & Moody's published estimated loss costs for life insurers
- Issue is fundamentally actuarial
- SoA Committee on Life Insurance Research commissioned study
 - POG chair: Tom Edwalds
 - Researcher: Jim Toole

Society of Actuaries Research Currently in Progress

- Scope includes life & health insurance
- Focus today is on mortality surge model
 - Describe & apply to industry aggregates
 - Show preliminary results
 - Highlight internal controversies

Focus on Mortality Surge Model

- Model assumptions
- Model inputs
 - Insurance
 - Pandemic scenario
- Methodology
- Estimating aggregate inputs for US Life Insurers
- Pandemic scenario inputs selection
- Results

Model Assumptions

- Mortality surge measured as excess deaths/1000
 - NOT excess % of expected
- Marginal tax rate 35%
 - Can adjust
 - Assume tax savings useful regardless of net income & surplus
 - E.g. net operating loss carry forward

Model Inputs

■ Insurance

- Inforce by quin age
- Average reserve/1000 by quin age
- Reinsurance ceded by quin age

■ Pandemic Scenario

- Deterministic
- Excess deaths/1000
- Excess mortality curve shape

Methodology: Net Claims

■ Gross claims

- Calculate excess mortality by quin age
 - = Excess deaths/1000 * shape % by quin age
- Calculate gross claims by quin age
 - = insurance inforce * excess mortality

■ Net claims = Gross claims - reductions:

- reserves released
- reinsurance credit
- tax savings

Methodology: Reductions

- Reserves released by quin age

= gross claims * avg reserve/1000

- Reinsurance credit by quin age

= reins ceded * excess mortality * reins credit %

- Will explain reinsurance credit % later
- Very controversial

- Tax savings by quin age

= 35% * (gross claims – reserves released – reinsurance credit)

Estimating Aggregate Inputs for US Life Insurers

- Inforce by Quin Age
 - LIMRA Study
 - US Census Bureau
- Reinsurance Ceded by Quin Age
 - MARC Survey
- Average Reserve/1000 by Quin Age
 - Estimated from data provided by POG

US Life Insurance Inforce Data Sources

- LIMRA Study, 2004
 - % owning individual life insurance
 - % covered by group life insurance
 - Average face amount, individual and group
- US Census Bureau
 - 7/1/04 US population estimate by quin age
 - Projection from 2000 census

US Life Insurance Inforce Estimate by Quin Age

- Break LIMRA age bands down to quin age
- Separately for individual and group, by quin age:
 - Inforce = population * % covered * avg face
- Sum tied to NAIC aggregate and LIMRA totals

US Life Reinsurance Ceded Estimate by Quin Age

■ MARC survey

- Total direct reinsurance ceded
 - individual & group
- Tied to AM Best

■ Data supplied by POG

- Reinsurance distribution by quin age

Pandemic Scenario Inputs

- Excess deaths/1000
 - Excess pneumonia and influenza
 - Seasonal flu kills 36,000 per year in US
- Excess mortality curve shape
 - Distribution of excess deaths by quin age
 - Expressed as % of scenario excess deaths/1000
 - 3 options built in to model: Flat, “U”, and “W”
 - Can create custom shape

Pandemic Scenario Inputs: Excess Mortality Curve Shape

■ Flat

- Same excess deaths/1000 used for all ages

■ “U” (Similar to 1957 or 1968)

- Most deaths at ages 0-4 and 65+
- Few deaths at working ages

■ “W” (Similar to 1918)

- Most deaths at ages 0-4, 20-40, and 65+
- Not identical to 1918 shape

Pandemic Scenario Inputs Selected

- Two scenarios explored:
 - Moderate (similar to 1957)
 - Excess mortality = 0.7 deaths/1000
 - “U” shape
 - Severe (similar to 1918)
 - Excess mortality = 6.5 deaths/1000
 - “W” shape
- Stress test, not prediction
 - No probabilities assigned

Reinsurance Credit %

- Still working on this factor
- Ratio of
 - Identifiable reinsurer capital available
 - Statutory surplus
 - Mortality bond securitizations
 - Reserve redundancy
 - Offshore reinsurance (not yet included)
 - Other
 - Scenario reinsurance death claims surge
 - = reinsurance ceded * excess mortality
- Maximum value is 100%

Results

Moderate Pandemic Scenario

- \$7.8 B - Individual Life gross claims surge
- \$2.0 B - Individual life net claims effect
- \$3.9 B - Group Life gross claims surge
- \$2.4 B - Group life net claims effect
- \$3.6 B - Reinsurance claims surge
- Reinsurance credit %: 100%

Results

Severe Pandemic Scenario

- \$94 B - Individual Life gross claims surge
- \$43 B - Individual life net claims effect
- \$46 B - Group Life gross claims surge
- \$29 B - Group life net claims effect
- \$35 B - Reinsurance claims surge
- Reinsurance credit %: 64%
 - Not final, will be higher

Summary

- Moderate pandemic scenario almost non-event for life insurers financially
- Severe pandemic scenario unpleasant and uncomfortable
 - But life insurance industry capable of paying all claims!

Open Issues

- Insured vs population mortality
 - Model will have inputs for population mortality surge & relative mortality surge of portfolio
- Reinsurance Credit
 - Offshore retrocession
 - Other available capital
- Asset losses
 - May introduce input factor into model

Questions?

Thank you!