



SOCIETY OF ACTUARIES

**ERM Symposium
April 2009**

RI4 – Current Topic: Influenza Pandemic

[Max Rudolph](#)

Current Topic: Influenza Pandemic

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Influenza Basics

- 8 genes made of RNA
 - Can live for up to 2 days on hard surfaces (air?)
 - lungs are only human cells with the right enzyme
 - RNA mutates easily (DNA does not)

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The Numbers 1918-1920

- About 25% contracted flu and 20-100 million died worldwide
- US: 25% morbidity, 2.5% mortality
 - $.25 * .025 = .6\%$ excess mortality
- 675,000 died in US (population is 3 times larger today)

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Impact of Poverty

- Combination of poverty/secondary infections drives greater impact in 3rd world countries
- High risk today
 - HIV/TB/malaria
 - Areas of malnutrition
 - Africa

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Pandemic Scenarios US Dept HHS

Characteristic	Moderate (1958-like)	Severe(1918-like)
Illness	90 million (30%)	90 million (30%)
Outpatient medical care	45 million (50%)	45 million (50%)
Hospitalization	865,000	9,900,000
ICU care	128,750	1,485,000
Mechanical Ventilation	64,975	742,500
Deaths	209,000	1,903,000

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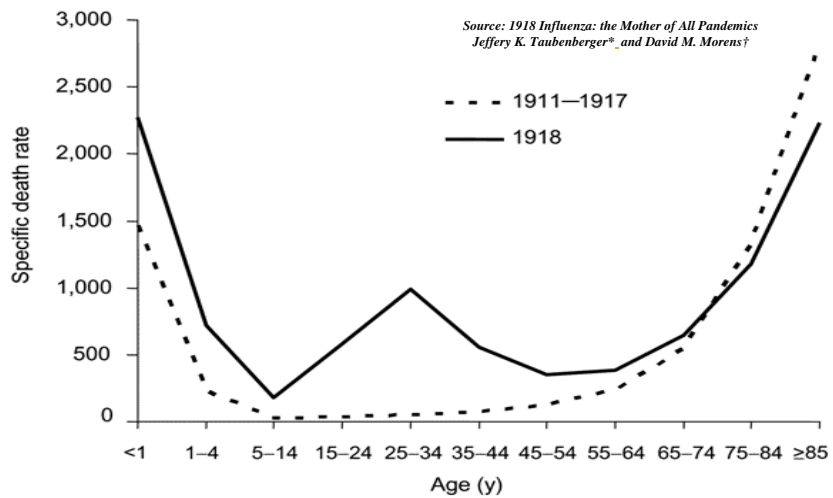
Risk to Insurers

- Insurance risk
 - Mortality and morbidity
- Economic risk (liquidity)
 - Global recession likely
- Counterparty risk
 - Reinsurer solvency
- Business continuity
 - Claims and customer service

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Mortality Curve: U or W Shape?



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Why a severe scenario could happen

- Supply chain constraints
 - Health care
 - Food/Energy/Services
- Virus mutations build resistance to drugs
- At risk population (HIV, cancer, diabetes)
- Poverty and malnutrition
- Reaction time
 - Travel
 - Vaccines take 6-9 months to develop

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Why a severe scenario won't happen

- Better health care
 - Intensive care units
 - Germ theory
 - Antibiotics
 - Antivirals
- Better coordination between human and animal disease researchers
- Working toward a vaccine

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“With the recent development of hygiene and sanitation as marked as it is, the world felt safe against the possibilities of any new conflagration from influenza. But the experience of the last two years has demonstrated that we are not so far advanced in our knowledge of this disease, of its cause and of the methods of its control as we thought we were.”

*James D. Craig and Louis I. Dublin
Actuarial Society of America
Transactions (Vol. XX, Part 1 No. 61)*

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Thank you!

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