Session 189: Health Insurers and Stress Testing Catastrophic Events

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Health Insurers and Stress Testing Catastrophic Events

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Session Description

While intended to assist health plan actuaries responsible for stress testing and ORSA filings, this session will also be informative for actuaries interested in communicating the **impact of potential catastrophic events for health plans** to their management and board.

It will begin with a discussion of **event thresholds** for stress tests and their impact on capital and financial statements.

Additionally, the session will take a detailed look at several **catastrophic event case studies** (historical and hypothetical) in the following areas: healthcare-specific (e.g., pandemic, specialty Rx), financial institution / credit market, operational / business, strategic, and multi-event scenarios.

Speakers

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Ken Ehresmann	Ken currently serves as a Senior Actuary for the Blue Cross Blue Shield Associations. In his current role he is responsible for facilitating strategic guidance and direction on actuarial, underwriting and general risk concerns for BCBS Companies.
Reid Kinney	Reid leads the health analytics team within Willis Re's Life Accident and Health practice. In his, 17th year in the insurance industry, Reid consults to risk-taking entities within healthcare on reinsurance, ground-up and excess risks, and ERM.
Dave Ingram	Dave heads Willis Re's ERM Advisory group, helping insurance company clients to develop and improve their Enterprise Risk Management practices. He was previously in the Insurance Ratings Group of Standard and Poor's (S&P) where he led their initiative to incorporate ERM into insurance ratings. Dave has also held executive positions within insurance companies.

Contents

1 Event Thresholds for Stress Testing

Stress Scenario Testing

Looking at the impact of an adverse event

- May not know the likelihood of that event

Stress Scenario Tests

- May not be comparable if they reflect vastly different likelihood

Levels of Adversity

- Periods of Normal Volatility
- Plausible adverse conditions
- Tail Events

Stress Scenario Testing (continued)

Historical Events

- Could be any level of adversity
- Good exercise to evaluate

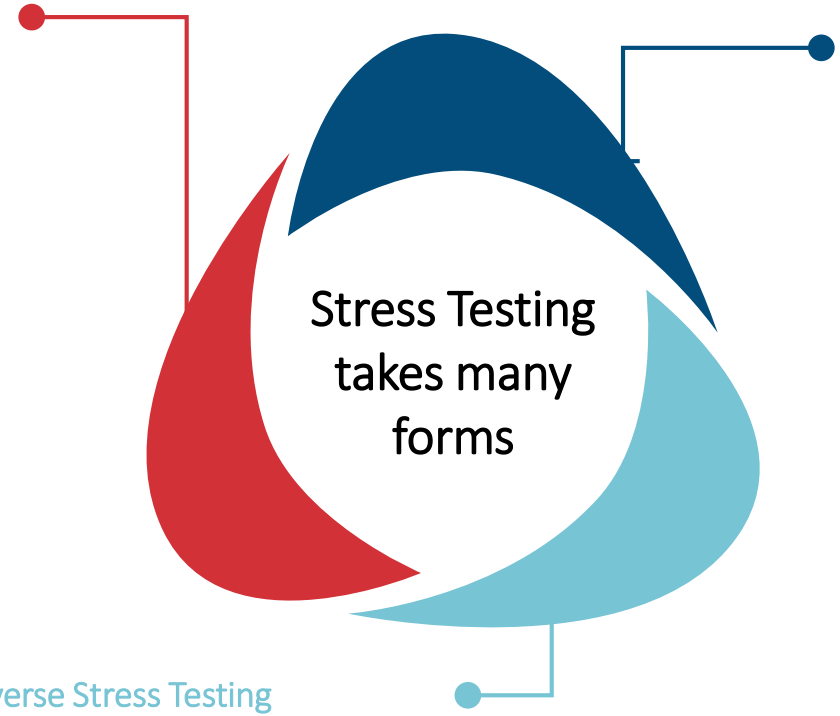
Combined Events

- Common to test multiple adverse events
- Most often these tests would be Tail Events

Stress testing
Application to business can take several forms

Sensitivity Testing

- Testing of single risk driver
- Individual risk exposure assessment
- Often calibrated to specific probability or confidence level
- E.g. 1-in-20 mortality event



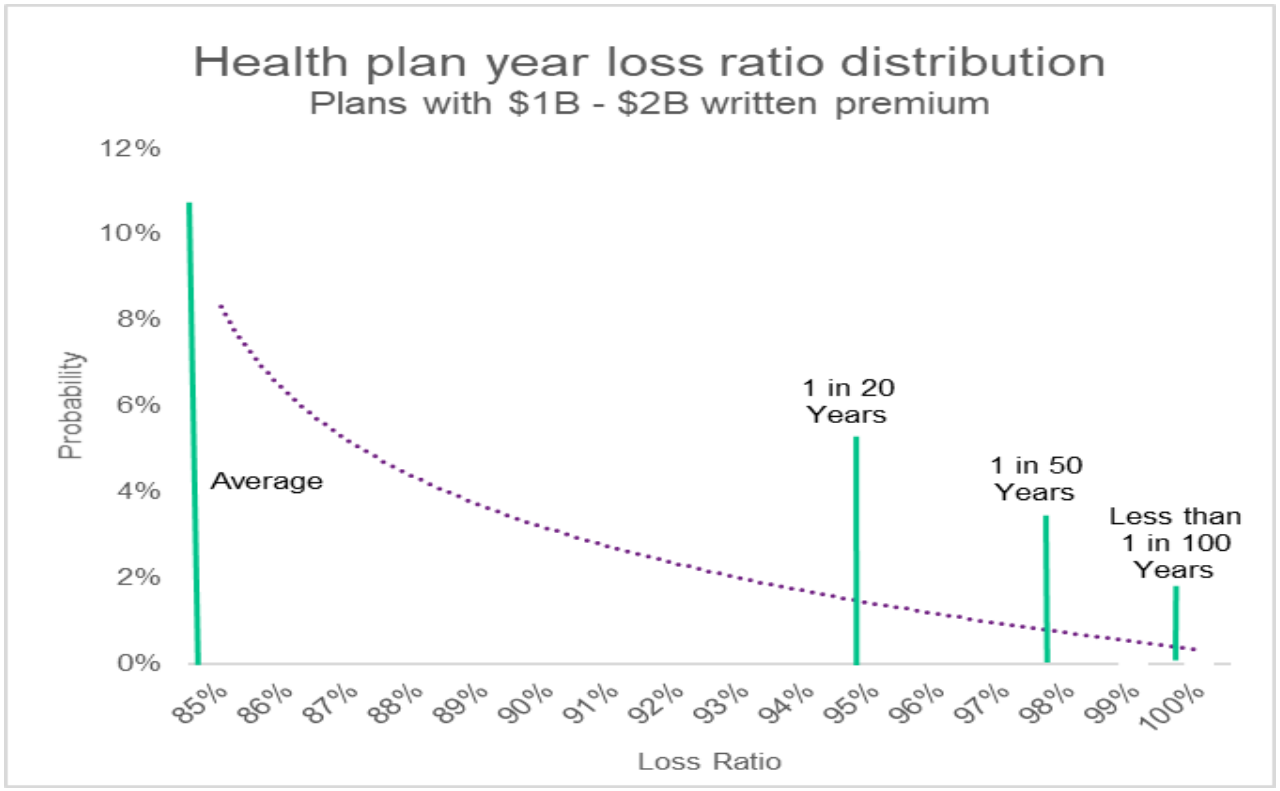
Scenario Testing

- Multiple risk factor assessment
- Plausible scenario incorporating multiple assumptions
- Historical and hypothetical scenarios
- E.g. Federal Reserve's annual stress test

Reverse Stress Testing

- Determination of sensitivity or scenario (risk event) that could lead to a pre-defined outcome ($X million impact on earnings or capital)

Health Plan Historical Volatility: Sample Industry Loss Ratios



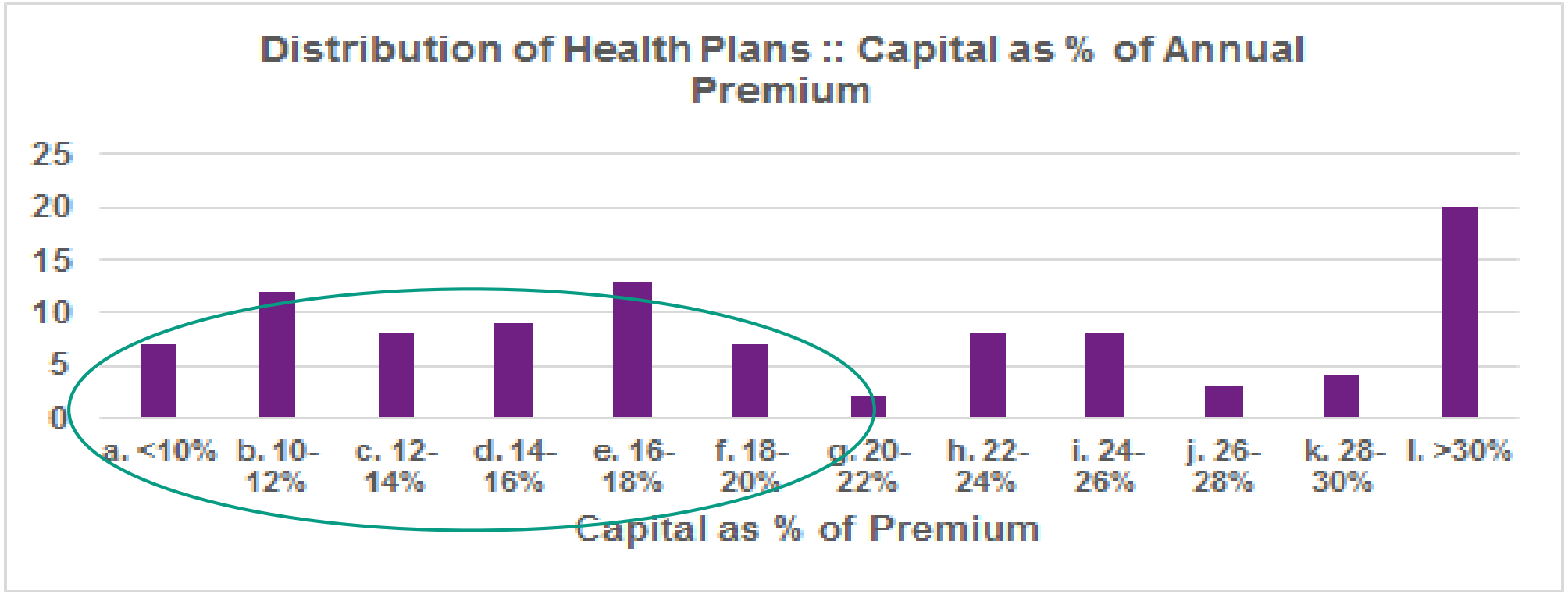
Health Plan Statutory Loss Ratios 2009-2018

- Loss ratios at or above 95% are infrequent (but do occur).
- Plans typically hold capital between 15% and 30% of annual premium.
- Loss ratio distribution will vary with the size of the Health Plan.
- What types of events could lead to a large miss?

*Data Source: US Statutory data from S&P Global Market Intelligence

How Much Capital Do Health Plans Hold?

How material is a large loss ratio miss, in capital terms?



- Almost half of health plans hold < 20% annual premium as capital.
- A loss ratio miss of more than 10 points would wipe out greater than half of each of these companies' capital.

*Data Source: US Statutory data from S&P Global Market Intelligence

2 Examples of Past / Possible Events

ACA / Political Instability

Scenario Background

Assume hypothetically, that the state where sell Individual ACA coverage **cuts back risk adjustment transfers by 50%.**

Your company is a medical insurer with Individual ACA **50K members**.

Your products and prices were designed to attract **greater than average risk**, which would be recouped by risk adjustment.

Specifically, 30K of your members are 25% **more morbid** than the population average.

ACA / Political Instability

Company Reaction

Year 1 results take a hit, as you were unable to recover 100% of anticipated risk adjustment payments. You, along with other companies, have filed suit against the state, but **recovering the money could take years**.

You hold a partial receivable for the shortfall, but take a **significant capital hit** to pay claims.

Assume your population is somewhat “sticky”, as **utilizers are less likely to move their coverage**.

You **price Year 2** defensively to cover risk, at a rate **15% greater than the market average**.

Through member attrition, you begin Year 2 with 35K members priced at a **10% premium deficit.**

ACA / Political Instability
Performing Stress Tests / Impact on Financials

- For the most significant scenarios, **impact on financial projections should be tested**
- Testing should incorporate potential **multi-year impact** (required by ORSA)
- Include both **income statement and balance sheet** impacts

	ACA Instability Scenario		
	Year 1	Year 2	Year 3
Revenue	Decrease	Decrease	Decrease
Claims	Neutral	Decrease	Increase
Expenses	Neutral	Decrease	Decrease
Income	Decrease	Decrease	Decrease
Loss Ratio	Increase	Increase	Increase
Expense Ratio	Increase	Increase	Decrease
Surplus	Decrease	Decrease	Decrease
RBC	Decrease	Decrease	Decrease
RBC Ratio	???	???	???

Year 2:

- Assume overall claim levels down a bit, but much larger reduction in revenue leads to spike in loss ratio
- It will take until year 3 to right-size fixed expenses for new membership

Year 3:

- Antiselective dynamic with lower, more morbid membership

Stress Scenario Test

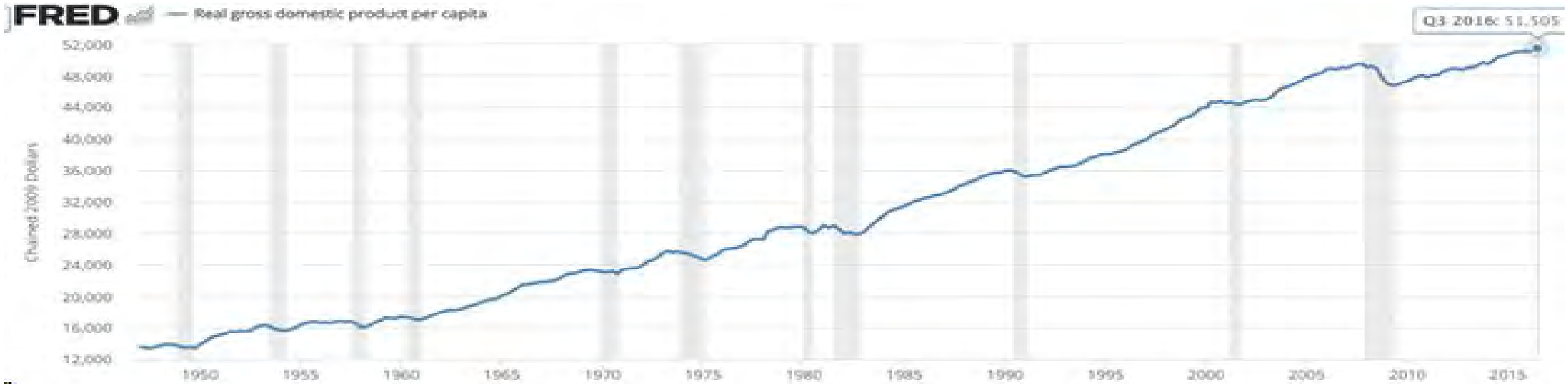
Economic Downturn - Recession

- Think about Recessions of various severities
- Normal Volatility

Recession that just barely triggers the 2 quarters of negative GDP growth definition. Might be triggered by temporary sharp rise in oil prices.

- Unemployment jumps to 6%
- Interest rates drop (and are pushed) lower
- Business activity declines for a year, slowly recovers
- A few people postpone elective procedures
- Increase in retirements and Medicare
- Shift to more Medicaid

Historical GDP



SOURCE: ST. LOUIS FEDERAL RESERVE BANK

Stress Scenario Test

Economic Downturn - Recession

Plausible Adverse Conditions

- "Average" recession
  - Most often caused by fed tightening in response to inflation
  - Perhaps scenario could be triggered by Brexit and Tarrifs
  - Significant drop in GDP – 4% to 5%
  - Unemployment exceeds 8%
  - Business activity takes 2 years to get back to pre-recession level
  - Unemployment takes 3.5 years
  - Businesses accelerate shift to providing less and less medical insurance
  - People start to postpone medical care due to higher deductibles and copays
  - Severity rises sharply due to deferred care
  - Sharp increases in Medicaid, Retirements and Medicare
  - Bonds Default and Stock market drops
  - Impacting insurer investment portfolios

Stress Scenario Test

Economic Downturn - Recession

Tail Event

- Recession that is as bad as 2007 – 2009
- Major investment losses
  - Stock market drops 40%, Bond defaults reach 3%
- Affiliated Hospital bankruptcies
  - Most owed money to Insurer that will not be paid
- Other doctors and hospitals feel financial pressure and seek to advance payments
- Commercial insurance premiums drop by xx%
- [What other sorts of things happened to health insurers during Great Recession?]

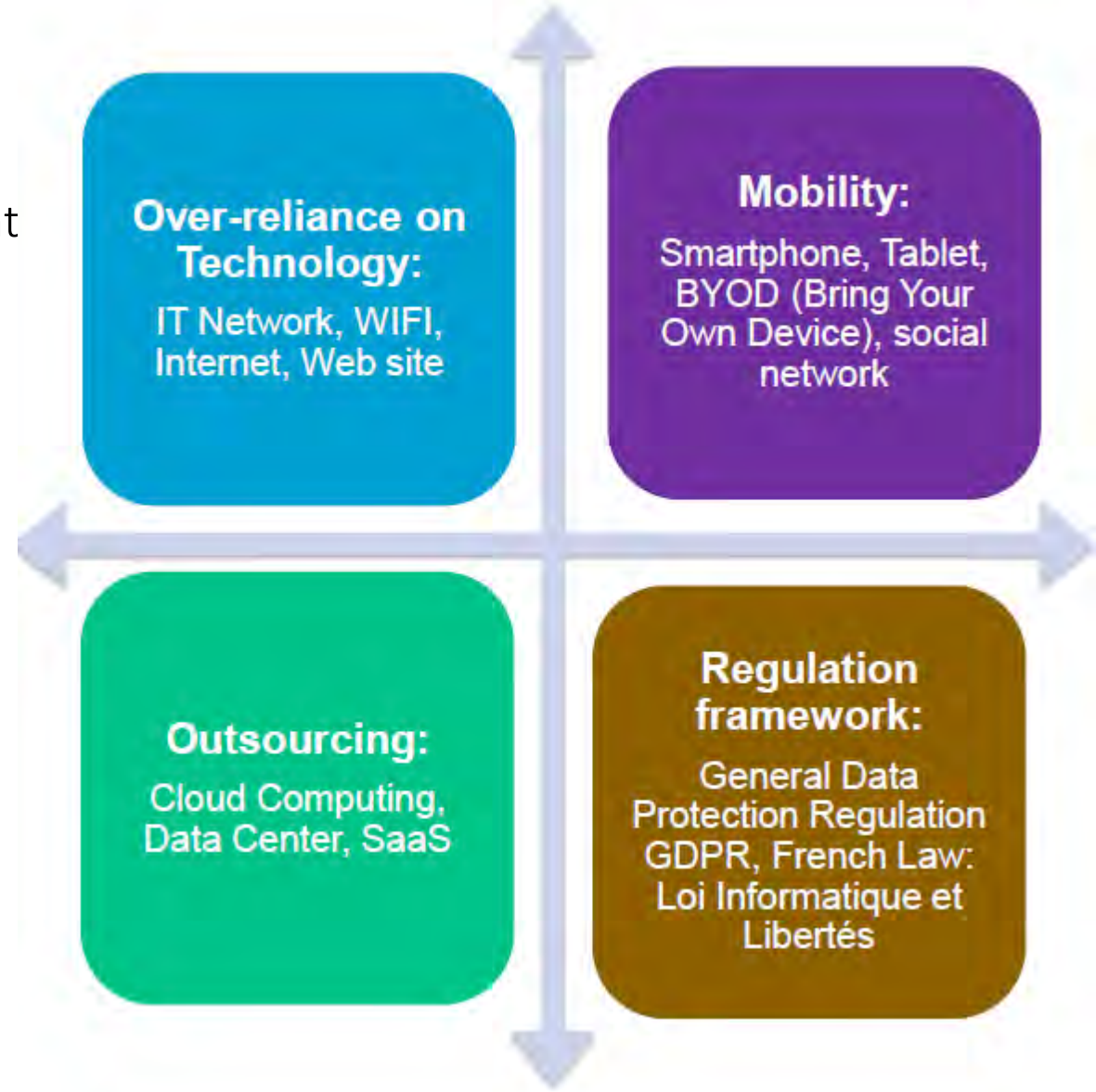
Scenario Stress Test

Cyber Risk

- Cyber risk tops many surveys of the most feared threat

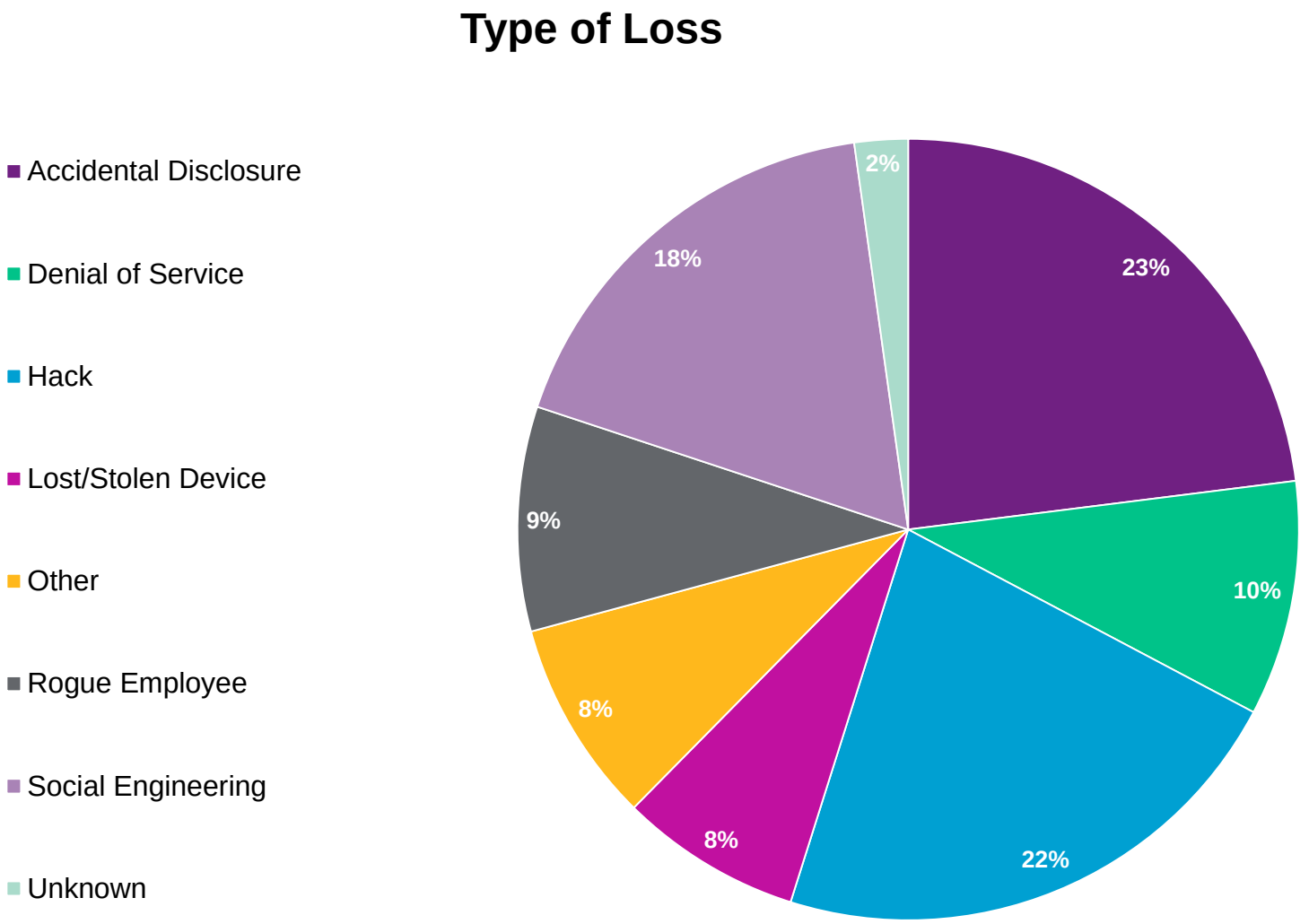
Multiple issues arise from a Cyber attack

- Operational Impact
- Regulatory
- Legal
- Investigation
- Privacy – Damages
- Settlements - Protection
- Reputation
- Systems Improvements



Cyber Claims

2017 – 2018 Reported Claims



Cyber Scenario

Data Breach

An employee has their laptop stolen. Their password was Pa55w0rd, which was the 6th guess of the hackers who acquired the "locked" laptop:

- With access to the laptop, the hackers were able to access all company systems
- Eventually, they downloaded and subsequently sold all of you customer records
  - Including all active and closed claim records
  - Including all personal data for all insureds both active and former

The story of this was discovered by the press and your local TV station has been running the story:

- It is picked up by a national TV news magazine for a feature that they are doing on data security

Class action lawsuit brought by a Mass Tort specialist law firm:

- Settlement includes:
  - Fine
  - Credit monitoring, Restitution for losses and other out of pocket costs incurred by Insureds
- Other costs – Legal defense, computer security enhancements, Public Relations
- Soft costs – Distraction of executive and staff attention for 8 months

Cyber Scenario

Hacking – Data Breach

Cyber Event Cost Comparison

Type	Type of Records	Year		Entity	Total Cost ($)
		Incident	Settlement		
Breach	Credit	2017	2019	Equifax	700,000,000
Breach	Personal	2014	2019	Yahoo	423,500,000
Breach	Credit	2019	active	Capital One	300,000,000
Breach	Credit	2013	2017	Target	292,000,000
Breach	Health	2015	2017	Anthem	115,000,000
Breach	Health	2014	2019	Premera Blue Cross	74,000,000
Breach	Health	2015	2017	Excellus BlueCross BlueShield	17,300,000

High Cost Claimants

- Historical Drug Example
- Future State
- Considerations for Stress Testing

Sovaldi (sofosbuvir)

High Cost - The cost of a 12-week regimen of Sovaldi along with two companion medications that patients must also take was around $100,000

Prevalence – an estimated 3.2 million people are infected with hepatitis C virus

Pent-up Initial Demand - In Sovaldi's first 30 weeks on the market, 62,000 new patients tried the drug

https://www.npr.org/sections/health-shots/2014/10/28/359553282/insurers-may-cover-costly-hepatitis-c-drugs-only-for-the-very-ill
https://www.mercurynews.com/2014/07/29/gileads-sovaldi-prescribed-more-than-all-other-hepatitis-c-drugs-combined/

Future of Specialty Drug Market

Gene Therapy and Cellular Immunotherapy

40-60 approvals by 2030*; 500,000+ patients in US across all markets (cumulative)

Price range: $375,000+ for cellular immunotherapies to $1M+ per patient for gene therapy

*Source: MIT NEWDIGS FoCUS, 10/2018

Challenges

Most have no close substitutes, rendering health plans' traditional efforts to control costs by encouraging generic substitution largely ineffective
Removal of annual and lifetime maximums, aging population, increase in patients with chronic and complex conditions
While comprising less than 1% of all U.S. prescriptions, specialty medications in 2013 for the first time accounted for more than a quarter (27%) of the country's total pharmacy spending.
Cumulative prevalence increasing but still unknown

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4123806/

3 Example of a Health Plan Collapse

Insurer Insolvency

- Market Characteristics
- Market Impact
- Considerations for Stress Testing

Market Characteristics

Low failure rate in health insurance industry

ACA Market Co-ops

High Demand, stable industry

Market Impact

To the extent assets of insolvent insurers are insufficient to fund Guaranty Association obligations, the Guaranty Associations may assess the member insurance companies to fund obligations, subject to certain limitations.

Inability to pay risk adjustment transfers (ACA Market)

Challenges

Limited information on competitors

Unlikely event – difficult to assess probability

Unclear on severity of insolvency

4 Sample Pandemic Calculation

What is a Pandemic?

- **Epidemic**

  Infectious disease affecting a disproportionately large number of people within a **specific population or community**, broadly speaking, a pandemic is a less-localized, more global version of an epidemic.

- **Pandemic**

  A less-localized, **more global** version of an epidemic.

What Happens in a Pandemic?

- Adverse health effects
- Increase in healthcare spending
- Economy slowdown / reduced consumer confidence
- Employee absenteeism
- Increase in deaths and life insurance claims
- Resource strain on healthcare system
- Impact on health insurers:
  - Increased utilization resulting in a loss ratio increase
  - Operational issues / processing increased number of claims

1918 Flu Pandemic – Could it Happen Again?

Societal Improvements

- Public Health / sanitation
- Vaccines and Anti-viral drugs
- Antibiotics and antimicrobials
- Technology
- Emergency response

Headwinds / Challenges

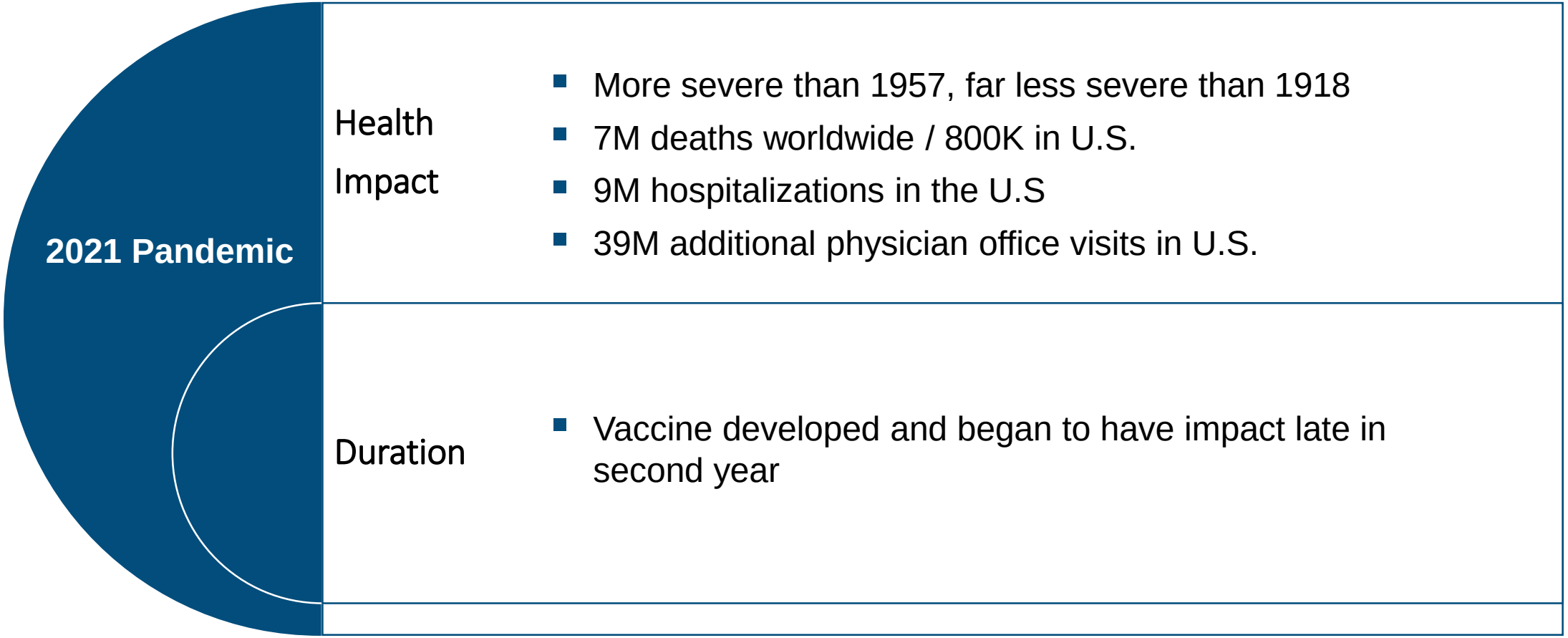
- Globalism / societal mobility
- Complacency

2021 Pandemic

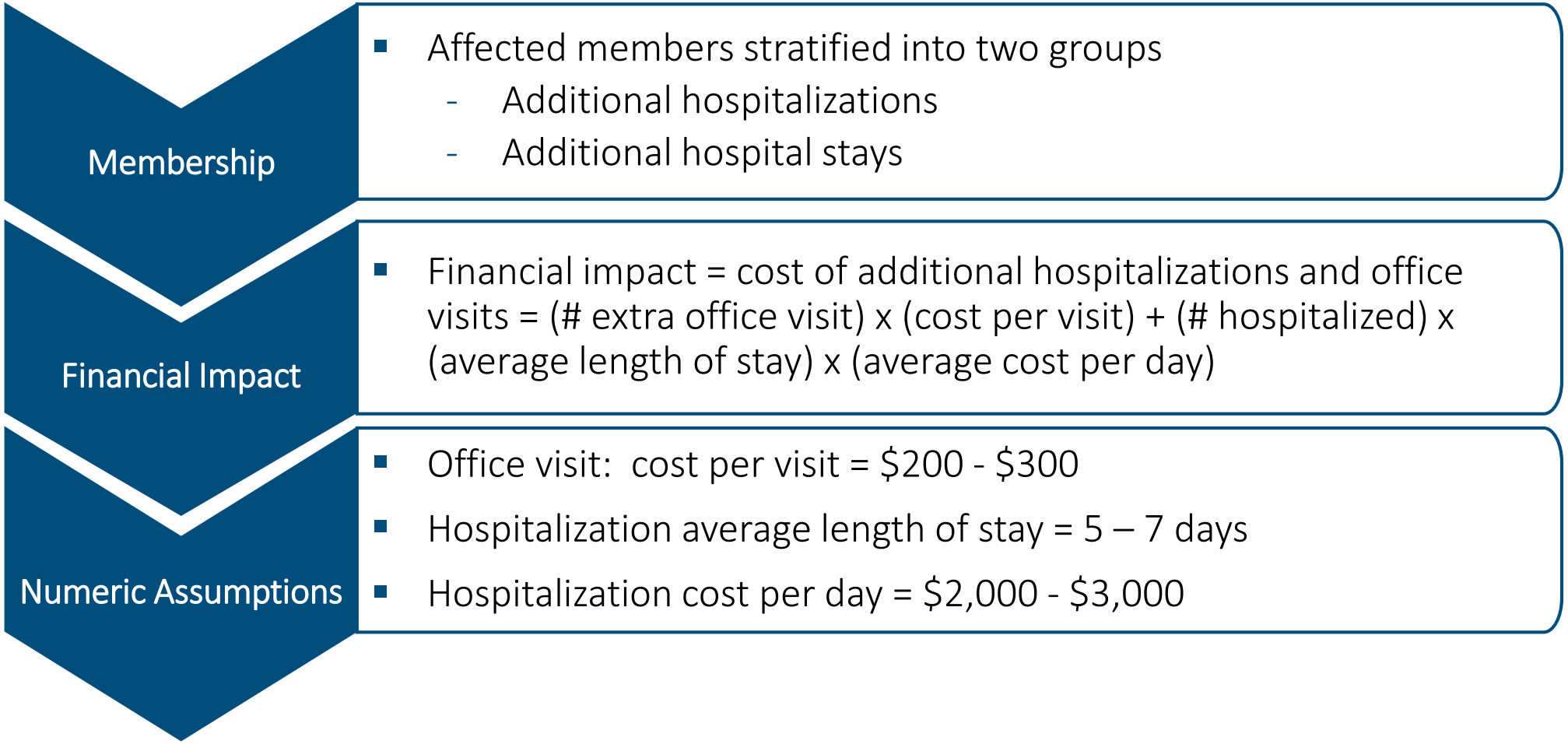
Scenario

- In the year 2021, a new strain of avian influenza develops in Hong Kong.
- Some local immunity
- With modern mobility and transportation, quick spreads throughout the world.

High-Level Impacts



Calculating Health Insurers' Impact



Insurance Company A

Pandemic Year 1 Sample Impact Calculation

Hospitalizations

- US hospitalization incidence rate = 9M hospitalizations / 329M US population = 2.74%
- Health plan hospitalizations = 2.74% x 100,000 members = 2,740 hospitalizations
- Hospitalization cost = 2,740 hospitalizations X $2,500 / day X 6 days = $41.1M

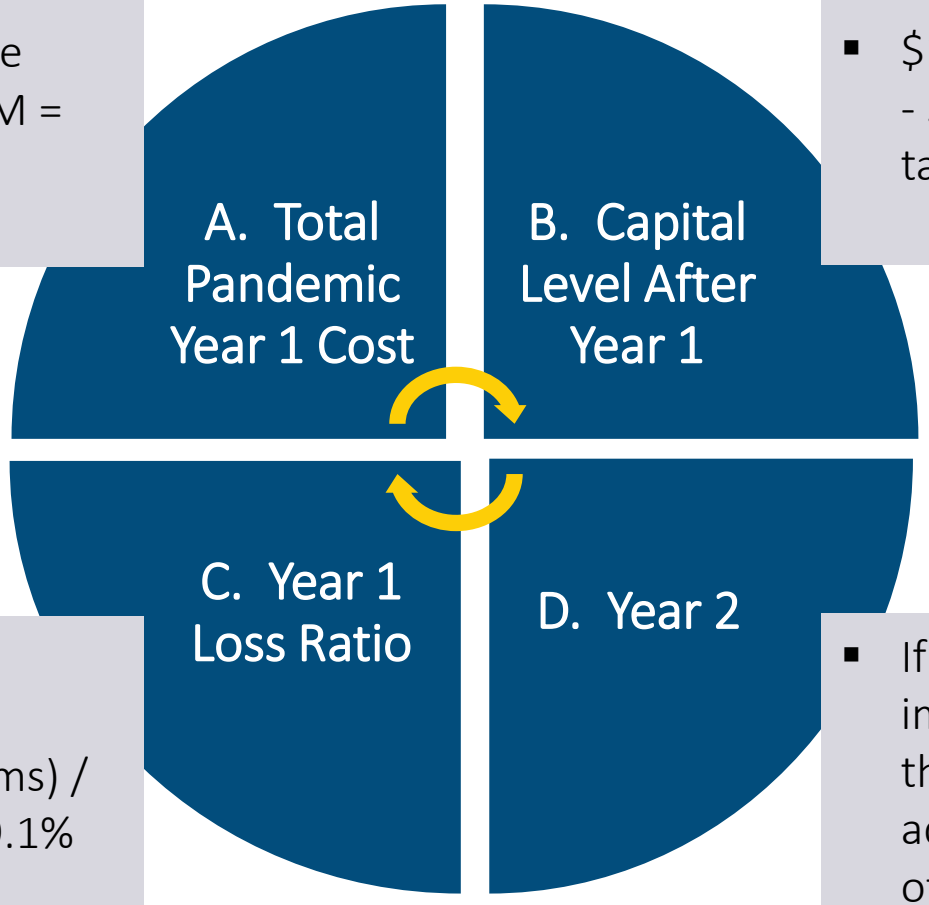
Office Visits

- US extra office visit rate = 39M visits / 329M US population = 11.85%
- Health plan extra office visits = 11.85% x 100,000 = 11,850
- Office visit cost = 11,850 x 250 = $3.0M

Tying the Pieces Together

RK

- Hospitalizations + Office Visits = $41.1M + $3.0M = $44.1M



- $120M – ($44.1M claims - $4.5M funding by profit target) = $80.4M

- ($85M target claims + $44.1M additional claims) / $100M premium = 129.1%

- If we assumed a Year 2 impact at half of Year 1's, this would lead to an additional draw on capital of > $20M.

Thank you!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