MBA Actuaries
CONSULTING SERVICES

Potential Impact of Extreme Events on the U.S. Health Insurance Industry

presented by

Jim Toole, FSA, MAAA

June, 2008

Summary

- Types of Extreme Events
- Modeling Extreme Events
  - Defining the Scenario
  - Impact on Providers
  - Impact on Insurers
  - Impact on Self Insurers
- Other Issues

Types of Extreme Events

- Natural Disasters
  - Hurricanes, Earthquake, Tsunami
  - Pandemic, Fire, Heatwave
- Human
  - Terror
  - Bio-Terror
  - Environmental

Scale

- Local, Regional, National
  - 2003 Rhode Island Nightclub Fire
  - Katrina
  - Pandemic
- Impact on Surge Capacity

Vulnerable Populations

- Elderly & Poor
- Lack of Social Safety Net
- Cultural Differences

MBA Actuaries
CONSULTING SERVICES

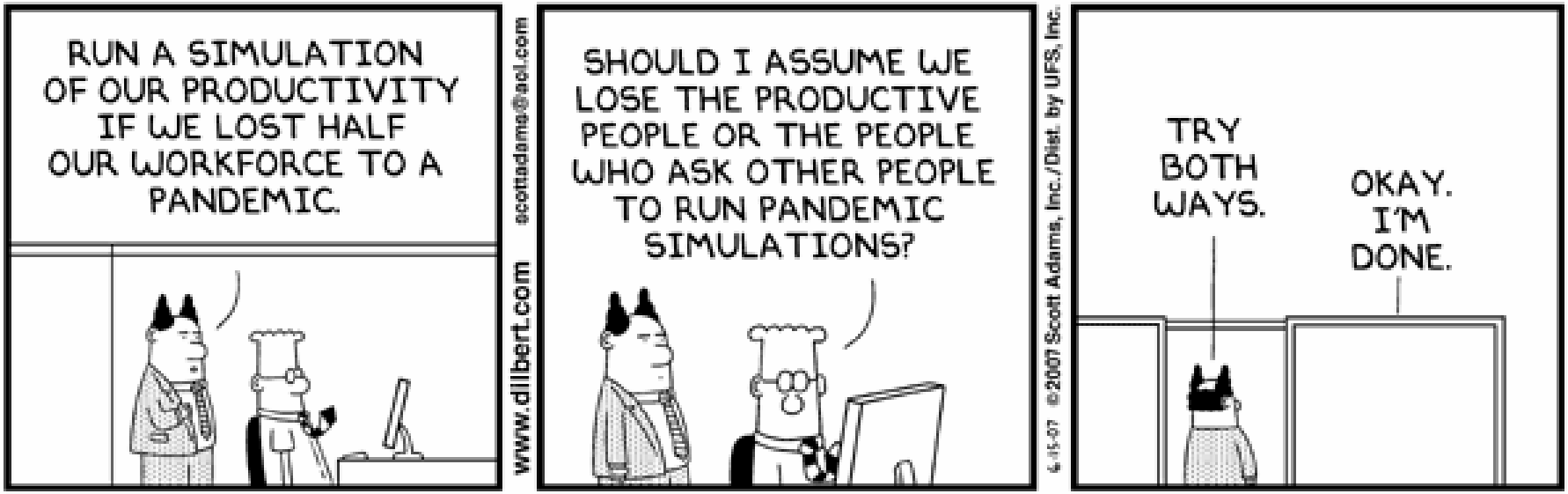
Modeling an Extreme Event

June, 2008

Scope

- United States
- Private Payors
  - *Insured and Self-Insured*
- Medical Only
  - *No LTD, STD, LTC*
- Quantify Results
  - *Spreadsheet model*
  - *Scalable to company level*

Modeling Approach



© Scott Adams, Inc./Dist. by UFS, Inc.

Modeling Approach

- How Many Covered Individuals Get Sick
- What Type of Care They Receive
  - Severity of Illness
  - Provider Capacity
- Estimate the Cost of Services
- Distribute Costs
- *Three Scenarios Contemplated*

MBA Actuaries
CONSULTING SERVICES

Pandemic Scenario Assumptions

June, 2008

Pandemic Scenario Assumptions

- Morbidity
- Waves
- Mitigation and Intervention

Morbidity

- Attack Rate: *How Many?*
- Severity: *Level of Care*
- Distribution by Age: *0 – 17, 18 – 64, 65+*
- Insured vs General Population: *Impact of Selection?*

Levels of Care

- Three in the Literature
  - *Self - Care*
  - *Outpatient*
  - *Hospitalization*
- Distribution Varies by Scenario
- Additional Level Contemplated in Severe
  - *Alternative Care Facility (Overflow)*

Waves and Surge Duration

- Waves
  - Pandemics have different wave patterns
  - Attack rate is sum of all waves
- Surge Duration
  - Like waves, duration varies
  - Will interact with system capacity
  - Conservative (and simplifying) approach is to assume all in one year

Mitigation and Intervention

- Delay Onset / Reduce Peak
- Mitigation
  - Individual, business and community preparation efforts
  - Challenge in quantifying impact
  - Tale of two cities: Philadelphia vs St Louis
- Intervention
  - Anti-virals & vaccines
  - Availability and effectiveness in question

MBA Actuaries
CONSULTING SERVICES

Potential Impact on Providers

June, 2008

Provider Landscape – Hospital

- Private Providers
  - Hospital Chains
  - HMOs
  - Urban vs Rural
  - Profit vs Not-For-Profit
- Public Providers
  - Department of Defense
  - Veterans Administration
  - Indian Health Service
  - Public/Municipal (Local)
- Alternative / Overflow

Provider Assumptions – Hospital

- Capacity Constraints
  - Staffed Beds
  - Average Length of Stay
- Cost Estimate
  - Acute Respiratory Distress Syndrome (ARDS)
  - SARS
  - Drug resistant pneumonia
  - Influenza
- Length of Stay Depends on Scenario
  - *Mid LOS may be longer, cost more than severe*

Displacement

- Every $1 spent on pandemic care crowds out elective care
- Conventional wisdom in a natural disaster is claims go down with little or no “make up”
  - Health infrastructure damaged
  - People busy surviving
- Pandemic tougher to pin down
  - CW is decrease in short term

Hospital Cost

Max (Scenario Hospitalizations, Capacity)

x Average Cost per Stay

– Displacement

Provider Landscape – Outpatient

- Primary Care
  - Private Practice
  - Physician Hospital Organizations
  - Capitated
  - Salaried
- Home Health Care
  - Nursing
  - Family

Provider Assumptions - Outpatient

- Capacity Constraints
- Cost Estimate
  - Services Provided
  - “Worried Well” vs Sub-Acute
- Access by Payor Type

Alternative Care Facilities – ACF

- Surge Capacity in Severe Scenario
- Every Locale Will Handle Differently
  - Nursing rather than acute care
  - Step down from hospital / convalescent
- No Precedent – *How to Model?*
  - Assume unbilled rejected by POG
  - Assume average bill between outpatient and hospital rate

MBA Actuaries
CONSULTING SERVICES

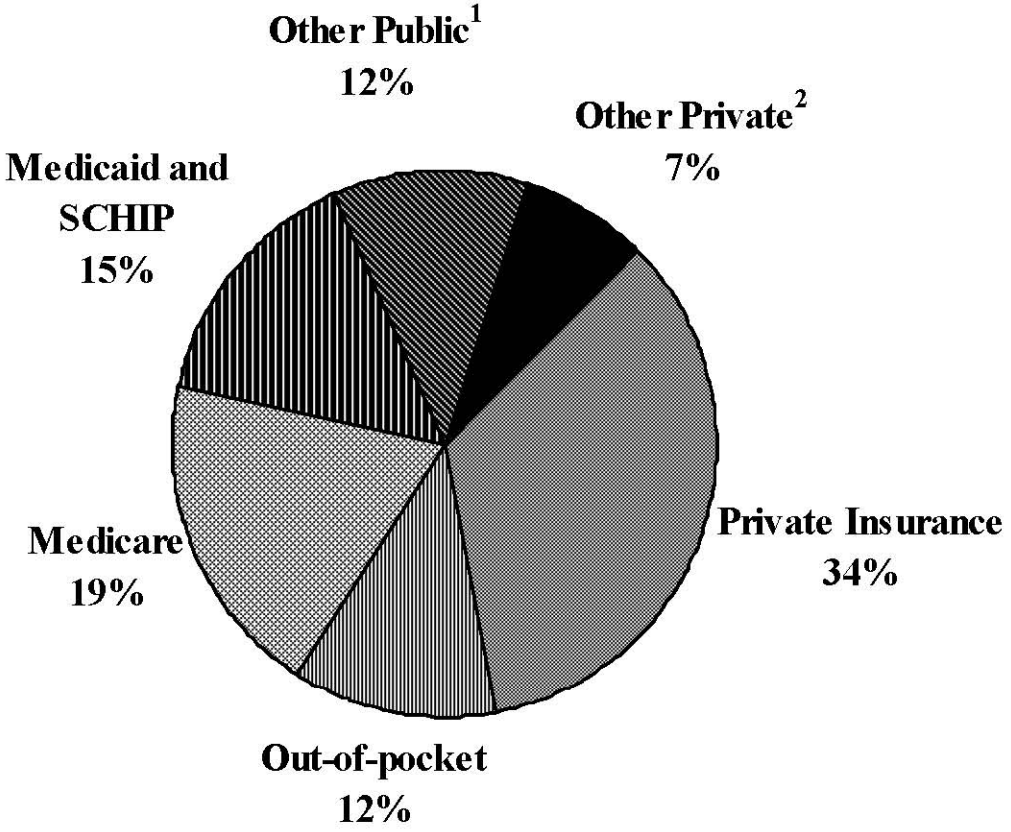
Potential Impact on Health Insurers

June, 2008

Payor Landscape

- Private Payors
  - Fully Insured
  - Advantage
  - Self Insured
  - MEWAs / PEOs
  - Uninsured
- Public Payors
  - Medicare / Medicaid
  - Federal Employee Health Benefits (FEHB)
  - Department of Defense
  - Veterans Administration
  - Indian Health Service

The Nation's Health Dollar, Calendar Year 2006: Where it Came From



[1] Other Public includes programs such as workers' compensation, public health activity, Department of Defense, Department of Veterans Affairs, Indian Health Service, State and local hospital subsidies and school health.

[2] Other Private includes industrial in-plant, privately funded construction, and non-patient revenues, including philanthropy.

NOTE: Numbers shown may not add to 100.0 because of rounding.

SOURCE: Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group.

Privately Insured Assumptions

For Each of Major Medical, Advantage & Medigap:

- Insureds (Exposure)
  - Premium
  - Age Distribution
- Reserves
- Reinsurance
- Impact of Taxes
- Capacity (Surplus)

Methodology

- Separate Hospitalization and Outpatient
- Quantify Based on
  - Pandemic Scenario
  - Selection & Mitigation
  - # of Covered Treatments (Access)
  - Treatment Cost Estimates
  - Line of Business Assumptions
- Variables, Vectors, and Multiplication

“Inverse Elliptical Curve”

Due to capacity constraints and sociological factors, a moderate pandemic may be more expensive to health insurers than a severe one

Other Considerations

- Cash Flow
  - Providers
  - Insurers
- Pricing and Reserving
  - IBNR
  - Adequacy
- Renewal Options
  - Will actuaries be able to sign off?
  - Will companies be able to pull out?
- Professional and Regulatory Implications

Self- Insured Plans

- Attempt Similar Methodology
  - No annual statements
  - Reasonable data sources?
- Less rigorous approaches
  - “Sample” plan (10,000 lives) and gross up?
- Reinsurance more important consideration
- Self insurers need to understand extent of risk

Why Self Insured Matters

- What is the Exposure of Business?
- Reinsurance Impact
  - Acute cost likely less than specific
  - Aggregate cover more on smaller groups
- ERM Double - Whammy
  - Business Continuity
  - Cash Flow Issues
  - Supply Chain

MBA Actuaries
CONSULTING SERVICES

Industry Role in Planning & Preparing

June, 2008

Insurance and Pandemic Planning

- Can't prevent a pandemic
  - Delay onset / reduce peak
  - Increases resources available
  - Beds, doctors, nurses, supplies
- Interests are aligned
  - Good risk management
- Governments strapped for resources
- Goodwill with stakeholders
  - *Customers and policymakers!!*

Role of the Industry

- Part of system and vested in it
- How do insurers come out as good guys?
  - Partnership beforehand
  - Communication before, during and after
  - Think “investment” not “expense”
- Risk management is our competency
  - Opportunity to expand relationship
  - Added value services
- Partner with Communities, Hospitals, Businesses, and Individuals

Industry Role - Communities

- Participate at local level; get your people involved
  - Health professionals into surge capacity pool
  - Others as leaders in community efforts
- Participate in planning and dress rehearsals
  - Simulations very helpful
- *Compare to industry's public health efforts at the turn of the century*
- Presumes preparatory efforts and some degree of competency on part of company

Industry Role - Hospitals

- 12 - 18 month blizzard
  - Top 50 items a hospital needs and how much?
  - Where do you store it?
- World wide nursing shortage
  - Help build, track volunteer workforce
  - Ensure adequate personal protective equipment for surge force
- Billing and cash flow problems
  - “PIP” style interim payments?

Industry Role - Businesses

- Help them prepare
- Communicate with employees
- Do they have special needs, considerations?
- What about self insured?
- Added value ERM consulting opportunity???

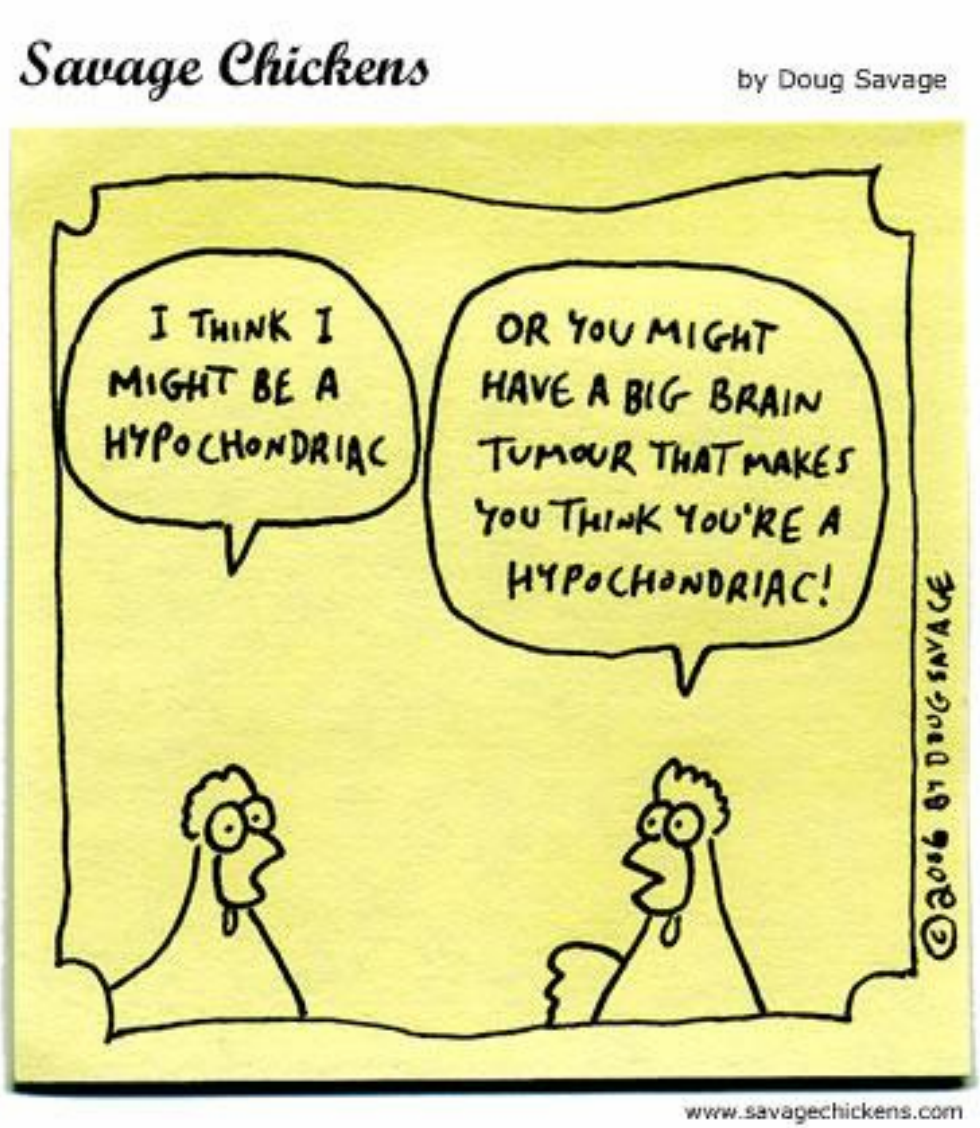
Industry Role - Individuals

- Information before, during and after
  - Consistent, accurate messaging
- How to provide home health care
  - May be the most valuable intervention available
- Chronic disease recommendations
- Need 90 day supply of meds

What will Recovery Look Like?

- Nothing comparable in modern era
  - Depression/dustbowl
  - Marshall Plan (but not infrastructure)
  - Great Society (but not a response to events)
- Civil governance challenges
  - What can we learn from Katrina?
- How will public view actors?
  - Government, providers, private insurers
  - If providers fail what will response be?
  - Further consolidation likely

Questions / Comments



MBA Actuaries CONSULTING SERVICES