The Actuarial Profession
making financial sense of the future

Health & care conference 2011
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Risk-based decision making in PMI

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Agenda

- An ERM framework for PMI
- Examples
  - Managing pricing and product design risks
  - Managing provider risks
- Reinsurance
- Potential trends to monitor
- Questions/Discussion

A definition of ERM

"Enterprise risk management is a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives"[1]

- Holistic view of all things which may affect entity
- Flows through to decisions

1. Committee of Sponsoring Organisations of the Treadway Commission

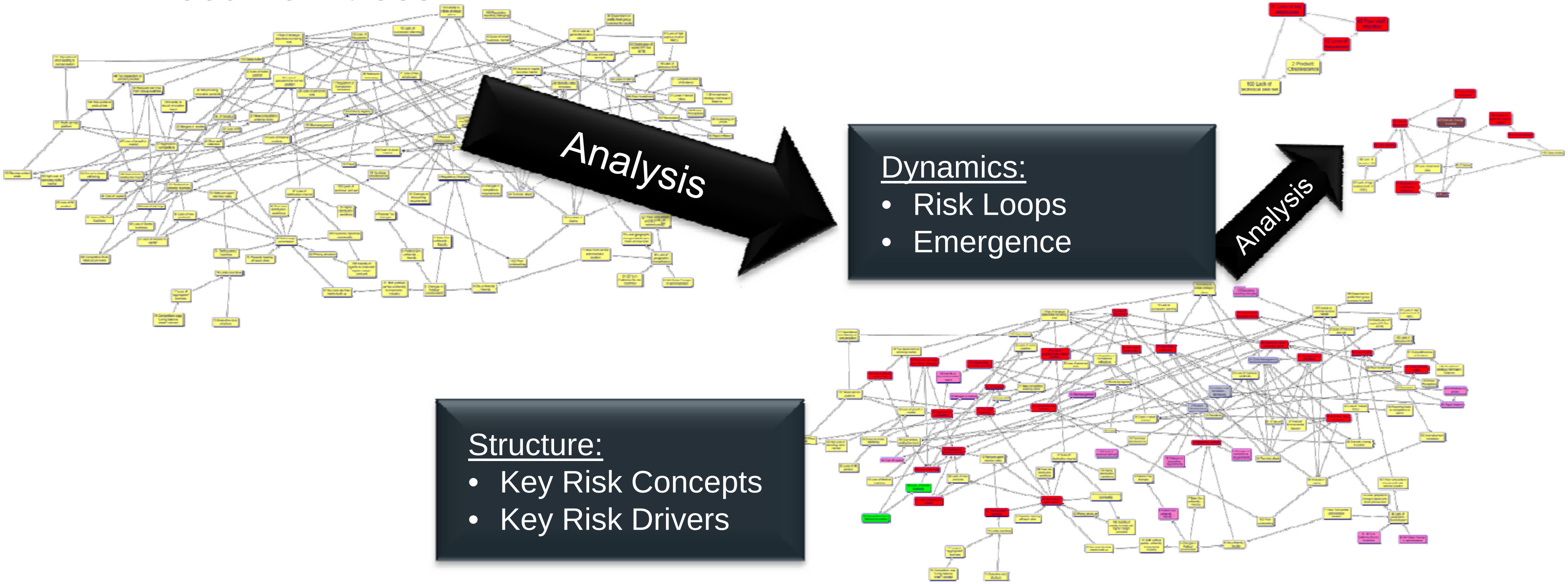
Understanding risk: describing the risk exposure

- Construct a cognitive “map” of risk exposure
- Talking to people:
  - focuses on strategic objectives
  - seeks to elicit understanding of how they may not be met
- By talking to many, can come to one “truth” that is multi-dimensional/multi-faceted & more than the sum of parts
- Result is a shared, repeatable, structured and robust understanding

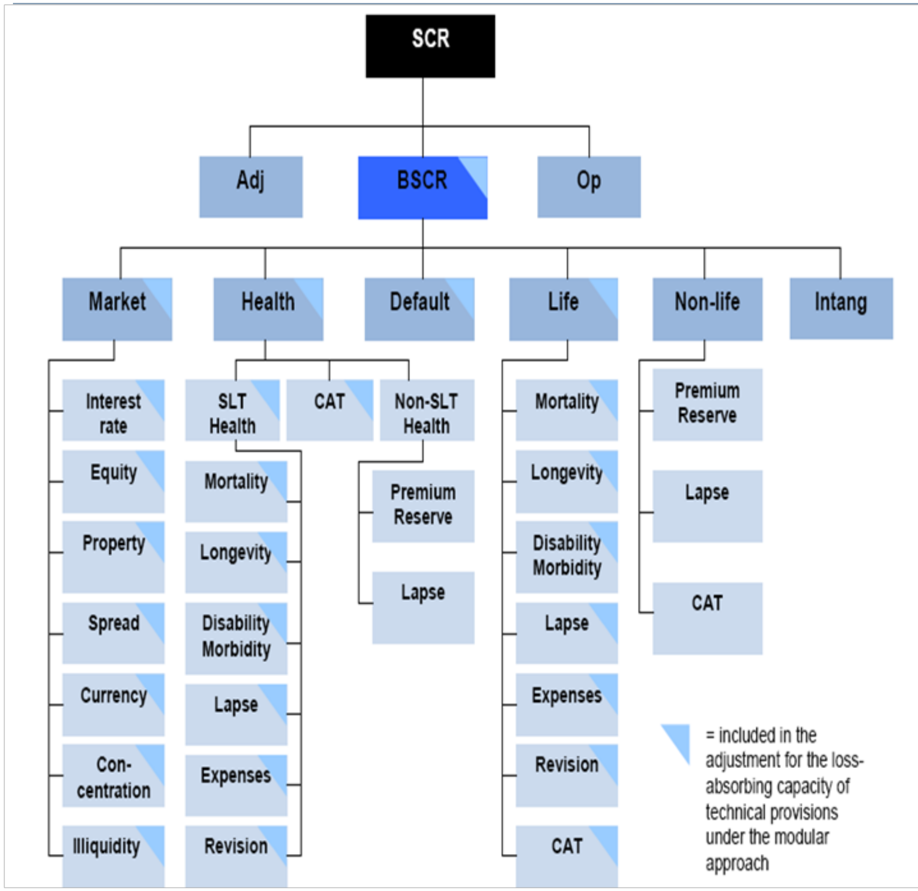
Individual “perspective” combines to bring powerful single view

Wood versus trees

- Map illustrates connections between risk concepts
  - tells a holistic story which no one individual would see
- Techniques from “complexity” sciences used to analyse the structure of risk exposure
- Entities’ risk exposures can be opaque and complex: this helps tease out wood from trees



The Solvency II world

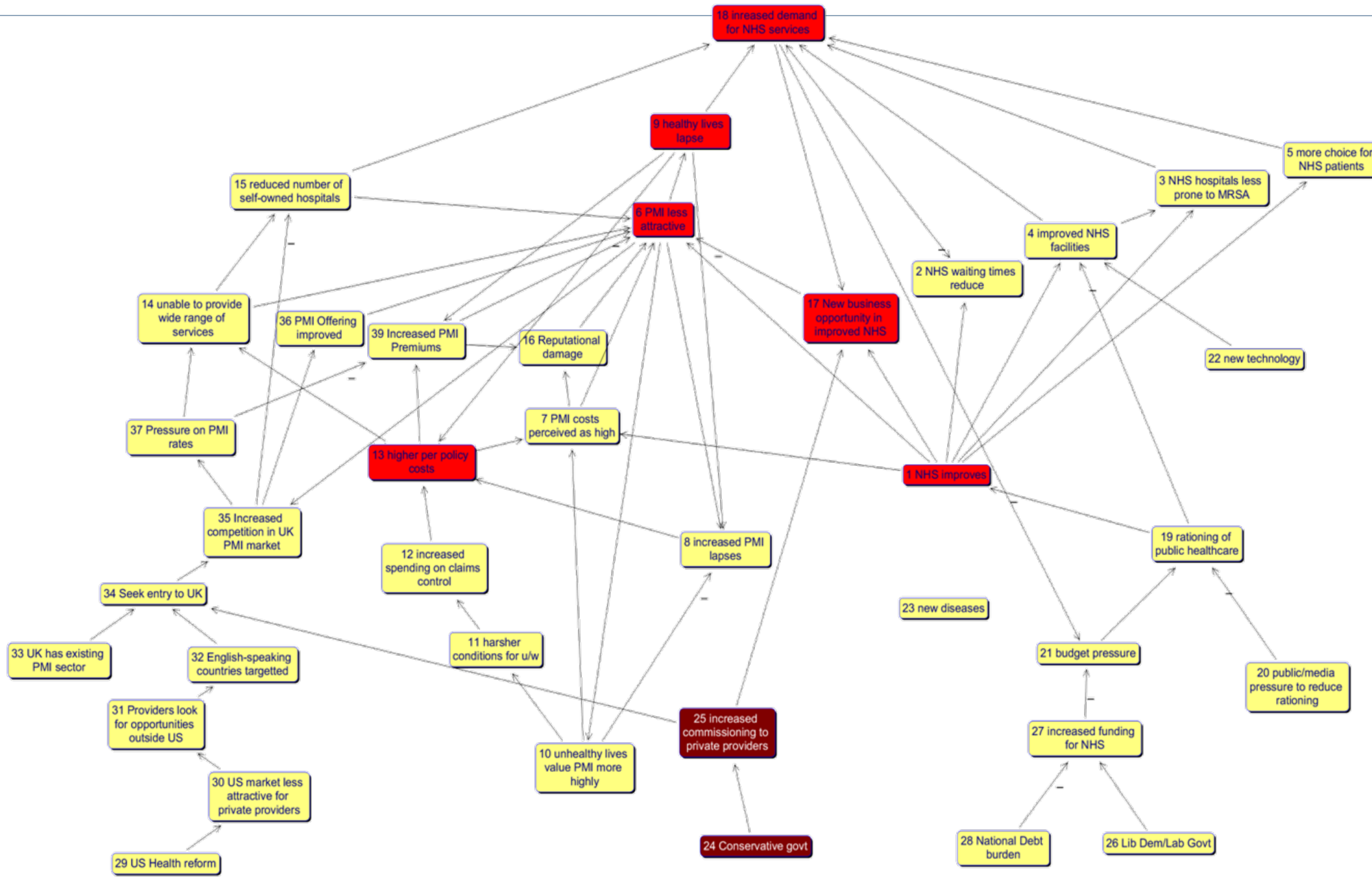


Health is different

- Short versus long term horizons
- Provider influence on insurer
- Macroeconomic environment effect
- NHS/political policy effect

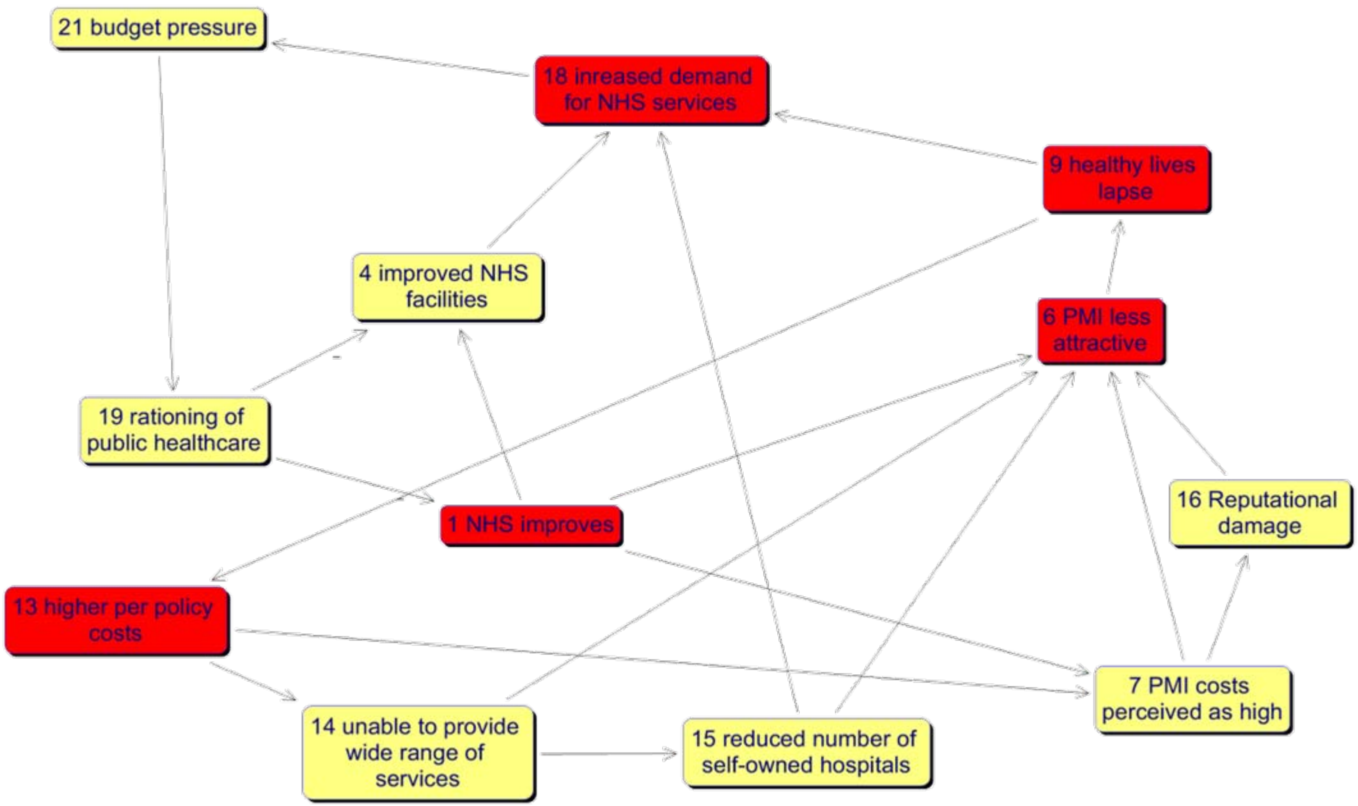
The "simplistic view from SII"

ERM IN PMI: A sample risk map



Risk Mapping: pulling out key dynamics

- The map is analysed using graph theory
- Key risks are identified and the drivers of these also found
- Key areas of dynamics can be highlighted



Understanding Risk Exposure

Describing risk this way provides:

- Analytical structure
- Audit trail
- Repeatability
- Insight into causal chain of enterprise

Use the map to:

- Investigate behaviour of dynamic features & simulate strategies
- Define data required to describe the risk exposure
- Create modelling scenarios
- Give common internal understanding of how risk works in the firm
- Communicate risk exposure outside the firm
- Help set tolerances in the right places
- Form robust hypothesis about where risks may emerge
- Understand non linear relationships/leverage points within complex systems

ERM: a brave new world?

- http://www.cbsnews.com/8301-504803_162-20060530-10391709.html?tag=component.0

- *A business plan is a holistic representation of what are you trying to achieve, INCLUDING sensitivities*

Example: typical current pricing process

- Marketing has bright idea
- Actuaries price:
  - Incidence x severity over one year
  - Take past incidence and severity experience and project into future
  - Adjust for benefit changes
  - Think about risks to frequency (anti-selection, socio-economic conditions)
  - Think about risks to severity (provider contracting, changes in mix of conditions etc)
  - Build in margin (explicitly or implicitly)
- Compare with competitors

Example: new pricing process

- Talk to key stakeholders to understand risks
- Build risk map for proposed product design
- Identify key underlying drivers of risk
- Build base scenario, modelling critical cash flows out over time (not one year)
  - Incidence
  - Severity
  - Cost of capital
  - Expense allocation
  - Margin
  - Lapses

Example: new pricing process

- Determine variations to base using risk map
- Look at distribution of outcomes for premium
- Determine risk versus reward tolerance
- Determine risk mitigation strategies for unacceptable risks
- Re-price - building in strategies as appropriate
- Communicate results and key risks
- Document for monitoring purposes
- Implement continuous monitoring of risks
- Feedback into re-pricing or other risk mitigation strategies

Example: typical current provider management

- Provider approaches you with new contract
- You may just take his word that it is an average 3% net increase on last year ☺. OR:
  - You extract historic utilisation and average cost data
  - Project data forward using best estimate trends
  - Compare current average costs with proposed contract
  - Calculate net overall effect on claims costs of new contract
  - Compare rates with other providers

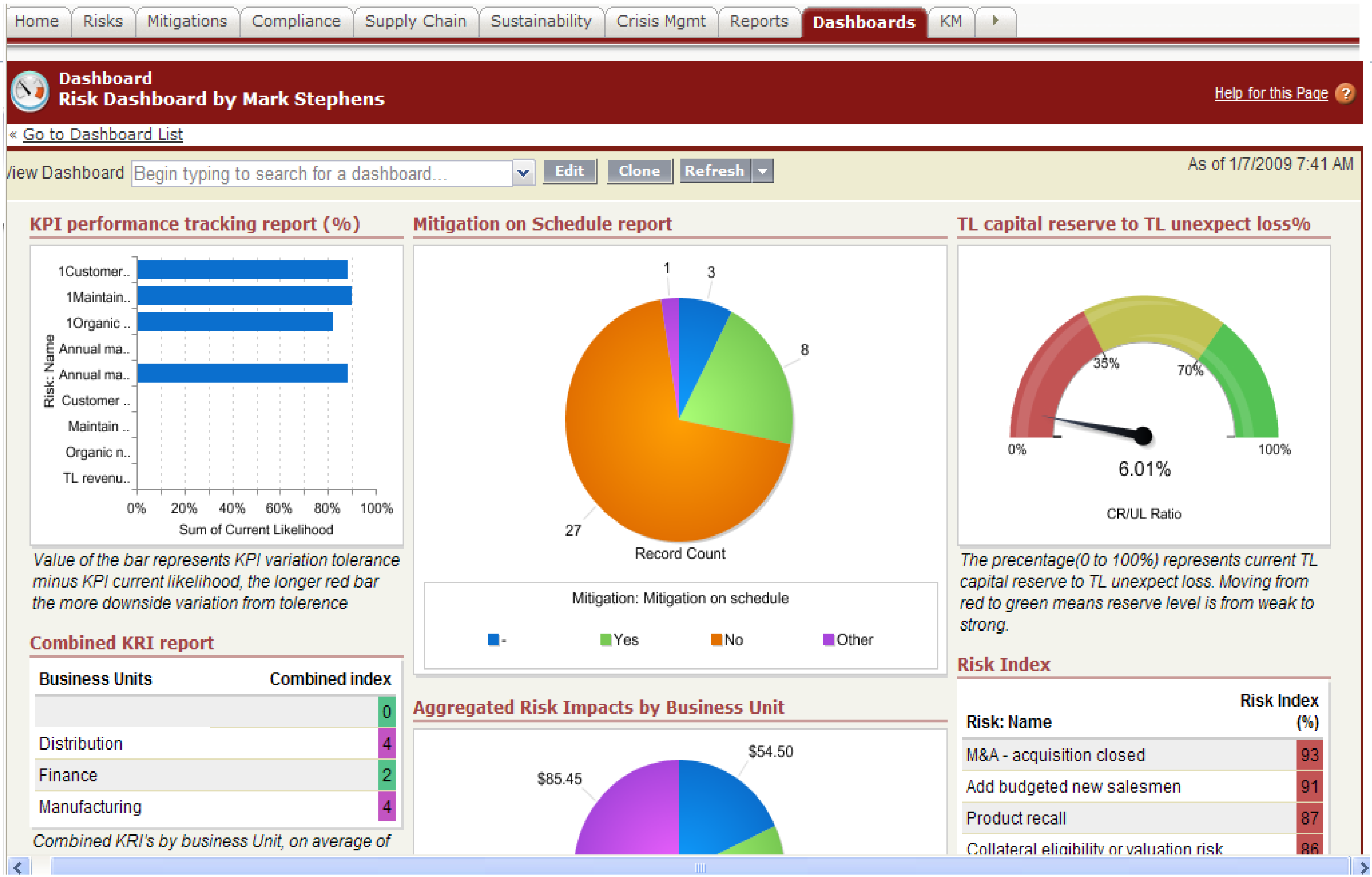
Example: new provider management

- Identify key risks in provider management relationship
- Build base scenario, modelling critical cash flows out:
  - Frequency by procedure code (Admits/ALOS)
  - Severity by procedure code (ALOS, Cost)
  - Distribution of costs by procedure code
- Model trends in each of these
- Determine variations to base using risk map
- Look at distribution of outcomes. Does new contract help to manage tail/deviation risk?
- Determine risk versus reward tolerance. What margin are we sacrificing to manage volatility?

Example: new provider management

- Determine risk mitigation strategies for unacceptable risks
  - Reduces supply of providers/competition?
  - Reduces quality of healthcare due to changed incentives?
  - Aggravates customers and leads to lapses?
  - Locks in current inefficiencies making further gains impossible?
- Determine value of new contract.
- Communicate results and key risks
- Document for monitoring purposes
- Implement continuous monitoring of risks

Risk Dashboard



Trends to monitor

- What product types will stay/go/change irrevocably?
- More awareness of risk and capital
  - Short term shocks versus long terms trends
  - ERM is here to stay. Benefits are sometimes intangible in short term, but will show up over long period
  - The insurer who learns to exploit an understanding of ERM in health ***and*** regulatory impact will take over the market. Not implementing ERM will lead to missed opportunities.
  - Lifetime customer value in health?
  - Where is the value in your business model? In customers, distribution, providers, care management?
    - .

Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenters.