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Communicating Mortality Results

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Agenda

- What is it
- How is it measured
- The benchmarks
- Its communication



Mortality What is it



What is it

- Mortality and longevity risks are different, although mathematically related
 - Mortality usually underwritten, while longevity risk is not
 - Early deaths financially affect in the opposite manner
 - The amount of negative correlation can differ significantly
- Mortality and longevity risks most often relate to trend and pandemic risks
 - Relevant experience is the primary concern
 - If new market or risk classification system is involved, the estimate of the base level of mortality can also be uncertain
 - Mix of risks are crucial
 - Insurer always to be careful in estimating the effect of anti-selection and moral hazard
 - Degree of risks and period



Mortality

How is it measured



How is it measured

- Weights used can vary
 - By amount of benefits or net amount at risk; by number of policies or covered lives
 - Depends on purpose and on how results are applied
 - Don't fully count period for competing risks
- Mortality risk
 - Is usually thought to be better related by amount, as the financial result is more often of relevance
- Although raw mortality rates can be interesting
 - Comparison to a benchmark is far more revealing and useful



How is it measured (2)

- Grouping of risks is important - possibilities
 - Mortality and longevity risk separated
 - Underwritten business and non-underwritten business
 - Time since issue (select & ultimate)
 - By risk classification
 - The more aggregate the assumption, the greater effect of change in mix can have
- Stratification by size
 - Can be a surrogate for underwriting



Risk classification		Males					Females				
		Current year					Current year				
Underwritten		1-2	3-5	6-10	11-20	20+	1-2	3-5	6-10	11-20	20+
Non-smoker	Preferred	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Smoker	Preferred										
Non-smoker	Standard										
Smoker	Standard										
Non-smoker	Sub-standard										
Smoker	Sub-standard										
Term conversion											
Group conversion											
Risk classification		Prior year					Prior year				
		1-2	3-5	6-10	11-20	20+	1-2	3-5	6-10	11-20	20+
Underwritten		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Non-smoker	Preferred	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Smoker	Preferred										
Non-smoker	Standard										
Smoker	Standard										
Non-smoker	Sub-standard										
Smoker	Sub-standard										
Term conversion											
Group conversion											
Non-smoker Preferred Current / Prior year		%	%	%	%	%	%	%	%	%	%

Mortality The benchmarks



Benchmarks

- Needed to compare with expectations
- Examples
 - Historical experience
 - Trend over time
 - Current pricing, dividend, or liability assumption
 - Business plan (usually short-term)
- Methods – Cox proportional hazards, age-adjusted, A-to-E
- Usually related to
 - Need for providing meaningful conclusions
 - Time (historical trends)
- Issues
 - Relevance if external
 - Select & ultimate – the select period, the ultimate level



Benchmarks

- Typical Actual-to-Expected template

Age group	Exposure (no.)	Males			Females			
		Deaths		Actual /	Exposure (no.)	Deaths		Actual /
		Actual	Expected	Expected			Actual	Expected
< 40								
40-49								
50-59								
60-69								
70+								
All								
	Exposure (FA)	Deaths		Actual /		Deaths		Actual /
		Actual	Expected	Expected	Exposure (FA)	Actual	Expected	Expected
< 40								
40-49								
50-59								
60-69								
70+								
All								



Mortality Its communication

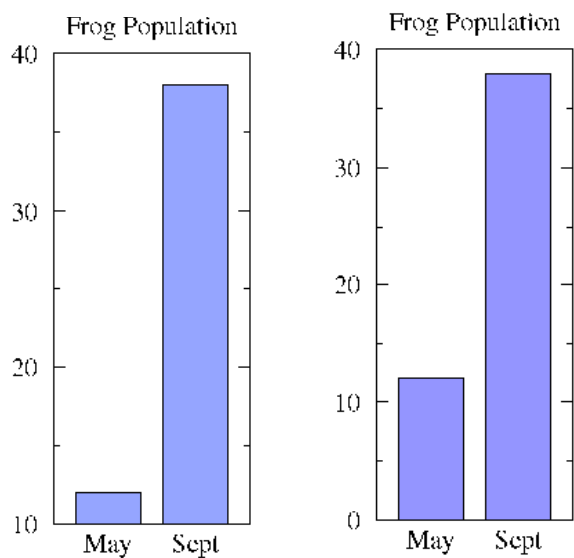


Its communication

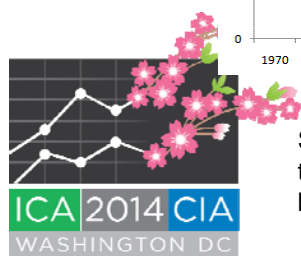
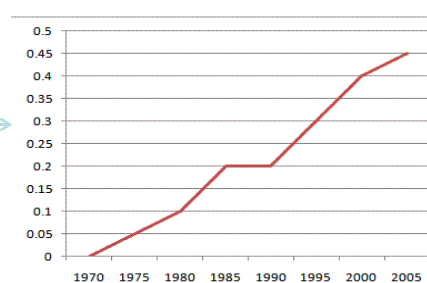
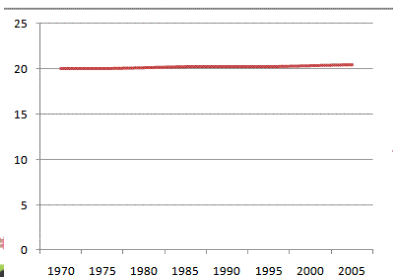
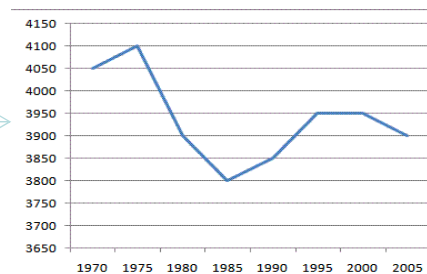
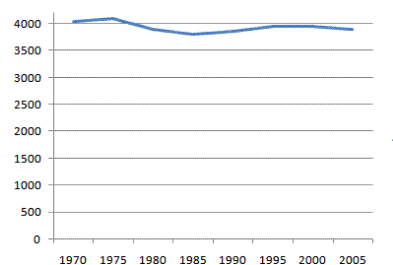
- The most effective method of communication depends on the intended users
 - CEO and investors need summary or even qualitative results
 - Researchers need detailed data by risk classification, coverage, external conditions and time
- Data warehouse and query/drill-down data ideal
 - Can take a long to implement
- Calendar year vs. policy year alternatives
- Period, year-to-date, and longer rolling period
- Heat maps for two-dimensional data insight



Care needed in showing trends



Care needed in showing trends



Source: BBC website
 top graphs - cosmic radiation rate in neutrons per hour
 bottom graphs - temperature and temperature change since 1975

Dashboard

- A brief synopsis of performance
- Usually only one or two metrics
 - Might have a separate mortality dashboard if significant financial effects and uncertainties
- Combination of trend and A-to-E charts
- Drill-down capabilities
- May differ in detail by user
- Goal – similar metrics across functional areas



External annual reports

- Most life insurers provide limited quantitative information regarding mortality performance
 - Mostly qualitative and general in nature
 - A few examples of quantitative disclosure include
 - The effect on DAC of a difference of 1% to demonstrate sensitivity of reported results
 - Pandemic risk
 - Effect on income and equity of a 10% increase or decrease in mortality
- Could include more, such as
 - Actual-to-Expected performance and source of earnings, including effect on profits due to parameter risk, trend risk and pandemic risk



- Sensitivity to alternative values of each of these
- New IASB Insurance Contracts accounting standard may come with more expanded disclosure requirements
 - For example, sensitivity to insurance risks on income and equity; concentration risks

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Uncertainty

- Causes of deviations from expectations
 1. Inappropriate expectations
 2. Part of a longer-term trend
 3. Change in mix of risk characteristics of exposures subject to mortality or longevity risks as a result of changes in such factors as underwriting, distribution, or lapses
 4. Identifiable non-recurring causes, including a change in mix of claims, such as deaths of insureds with large benefits
 5. Random fluctuations.



Uncertainty (2)

- Sources
 - Trend
 - Pandemic (one-shot)
 - Level (especially due to limited relevant data)
- Analysis
 - Scenario and sensitivity testing
 - Recognize asymmetric risks
- Explicit or implicit margins
- IASB's *Insurance Contracts*



– May result in enhanced disclosures, e.g., actual-to-expected, sensitivity analysis, and concentration risks

Summary

- Communication of mortality results can be enhanced
- Dashboards, KPIs and charts
- Risks include level (if limited inputs), trend, pandemic
- *Insurance Contracts* will require enhanced disclosures
 - Improved understanding of the financial effects, uncertainty, and causes of deviations from expectations can lead to enhanced decision-making



