Gavin R. Maistry, FSA, CERA, FSAS, CFA
Chief Actuary & CRO, Munich Re, Life APAC, Singapore

Munich RE

Institute of Actuaries of India

Session 10: Reinsurance: A Tool for Risk Management

Gavin R. Maistry

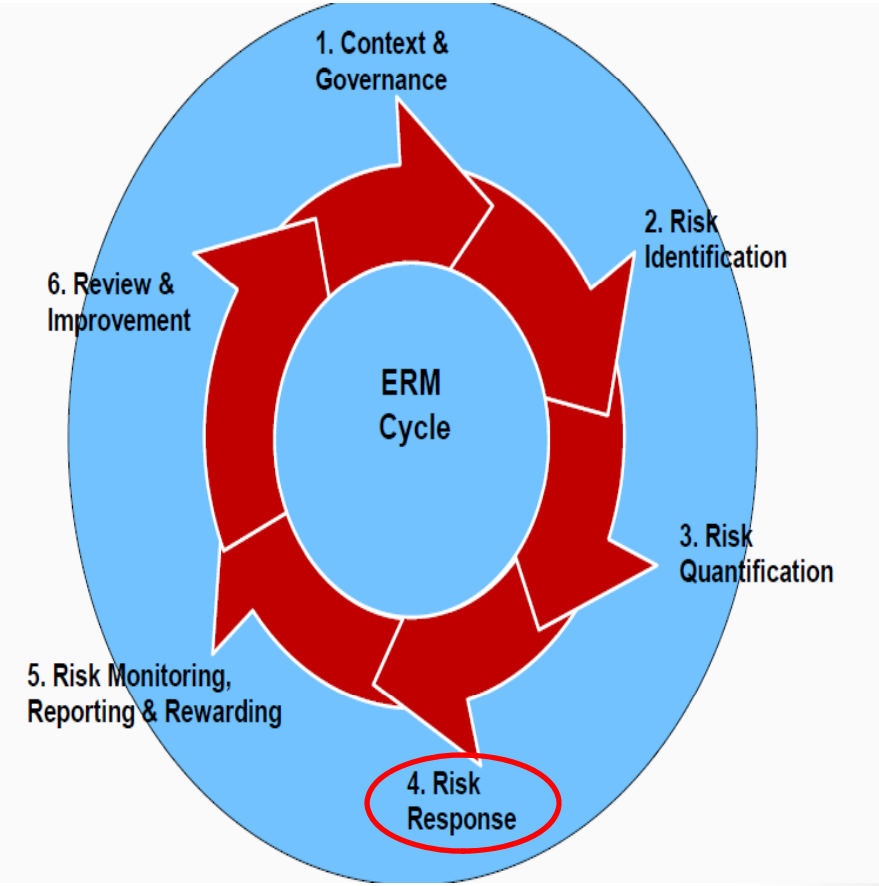
Chief Actuary & CRO – Munich Re, Life APAC

Waves of Reforms…Oceans of Opportunities

2013 AGFA & 15th Global Conference of Actuaries

17th – 19th Feb, 2013 | Mumbai, India

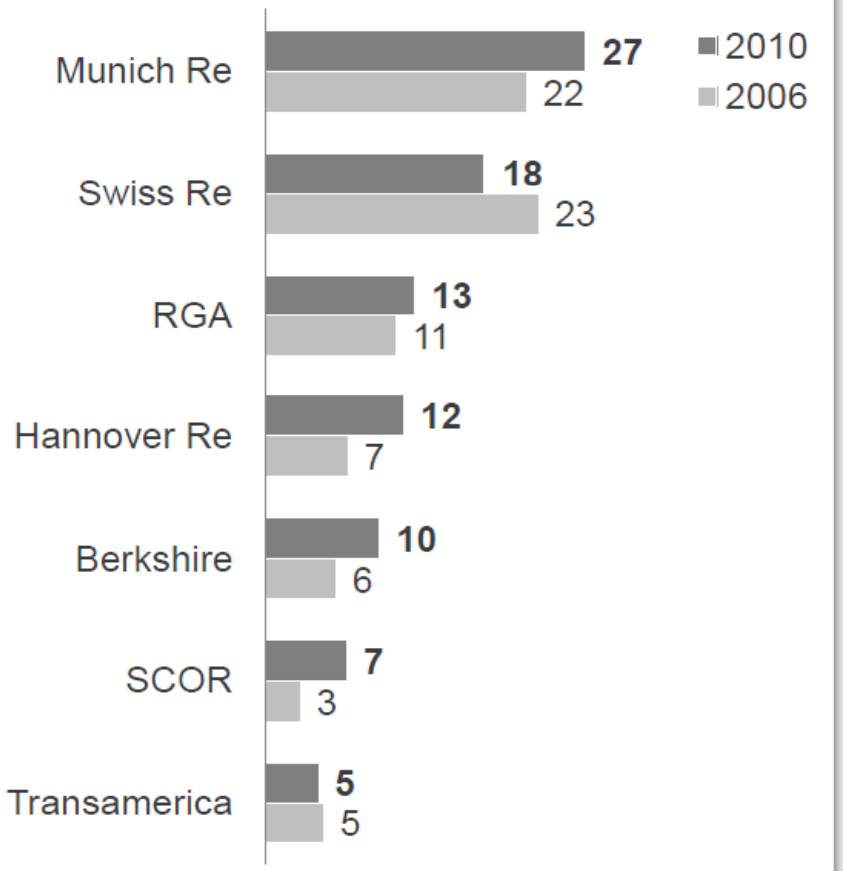
Reinsurance: A Tool for Risk Management...



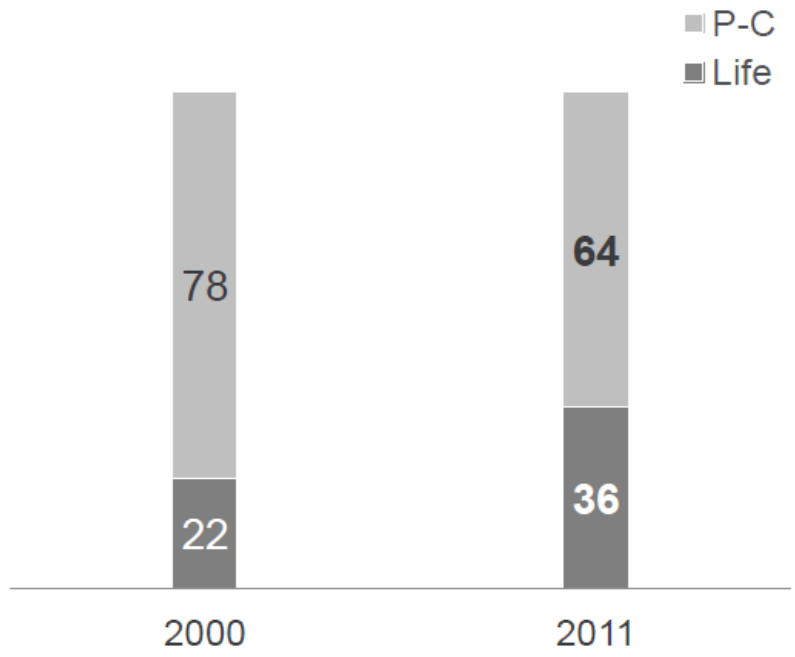
Avoid	not accept the risk - e.g. exit the business
Accept	accept the level of risk and take no further action to minimize it further
Transfer	transfer the risk - e.g. to a reinsurer or the capital markets (securitization)
Mitigate	take action to manage risk through natural hedges or other controls

The Life Reinsurance Space...

Global life and health market share[1]



Share of life business within reinsurance segment[2]



Life share increasing….

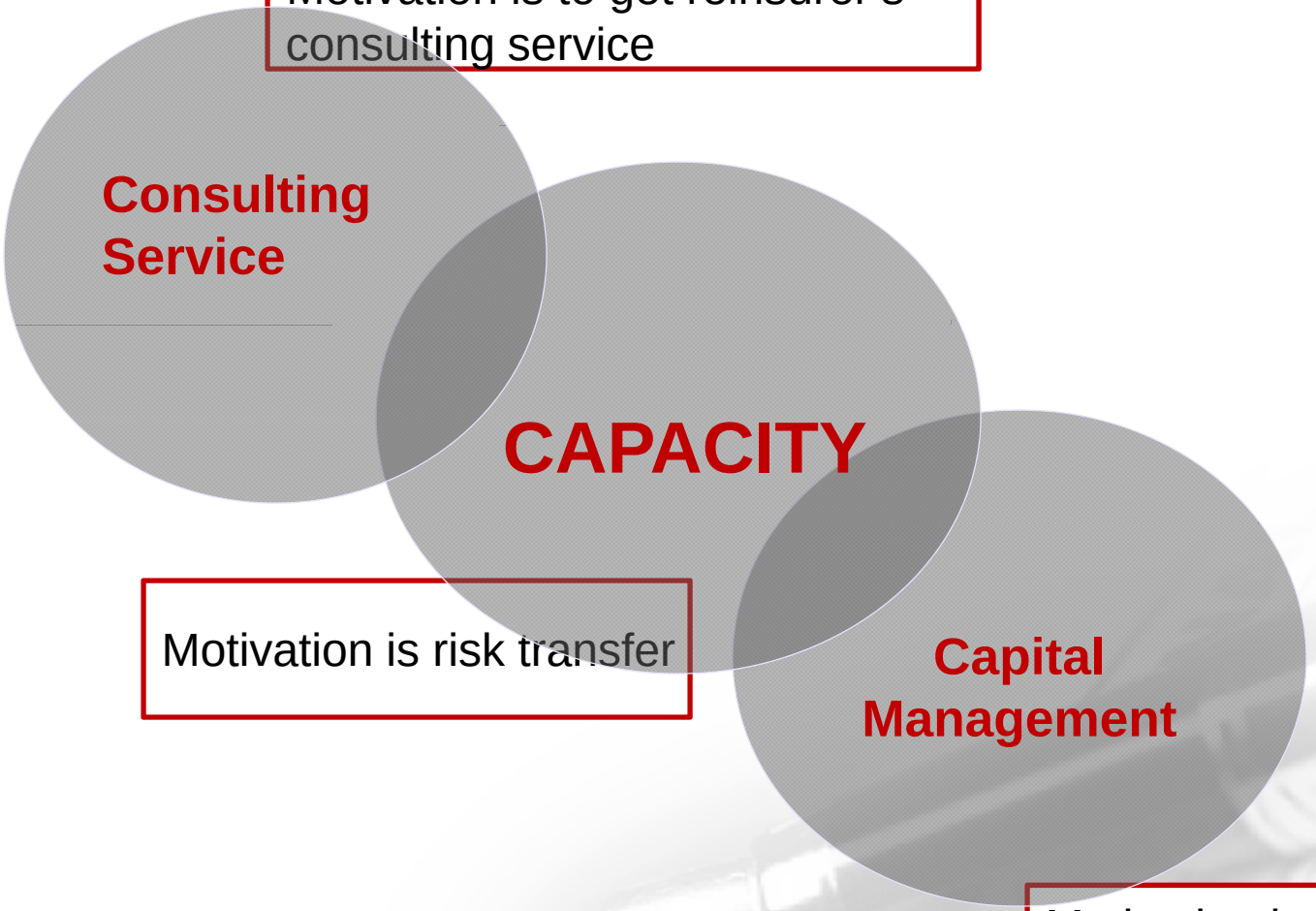
[1] Source: Munich Re Economic Research. Estimates based on life and health net earned premiums as reported in company reports.
[2] Segmental share of gross written premium (health reinsurance excluded).

Reinsurance vs. Capital Market Solutions…

	Reinsurance	ILS
Credit risk	Will depend on rating of the reinsurer	Cat bonds avoid credit risk to the issuer
Basis risk	None – as reinsurance is based on company's actual portfolio	Significant – as insurer pays own losses but receives payoff on index
Moral Hazard	Primary firm may be lax in uw – reinsurer needs to align interests	Defining ILS on index controls moral hazard
Size & Costs	Could be done for smaller deals & on a less costly basis.	Need to be of a certain size to be economically viable. Costly.
Capacity	Limited capacity	Independent capacity
Price Dependency	Prices may depend on market cycle	Limited dependency on insurance market cycle

The 3 C's of Reinsurance…

Motivation is to get reinsurer's consulting service

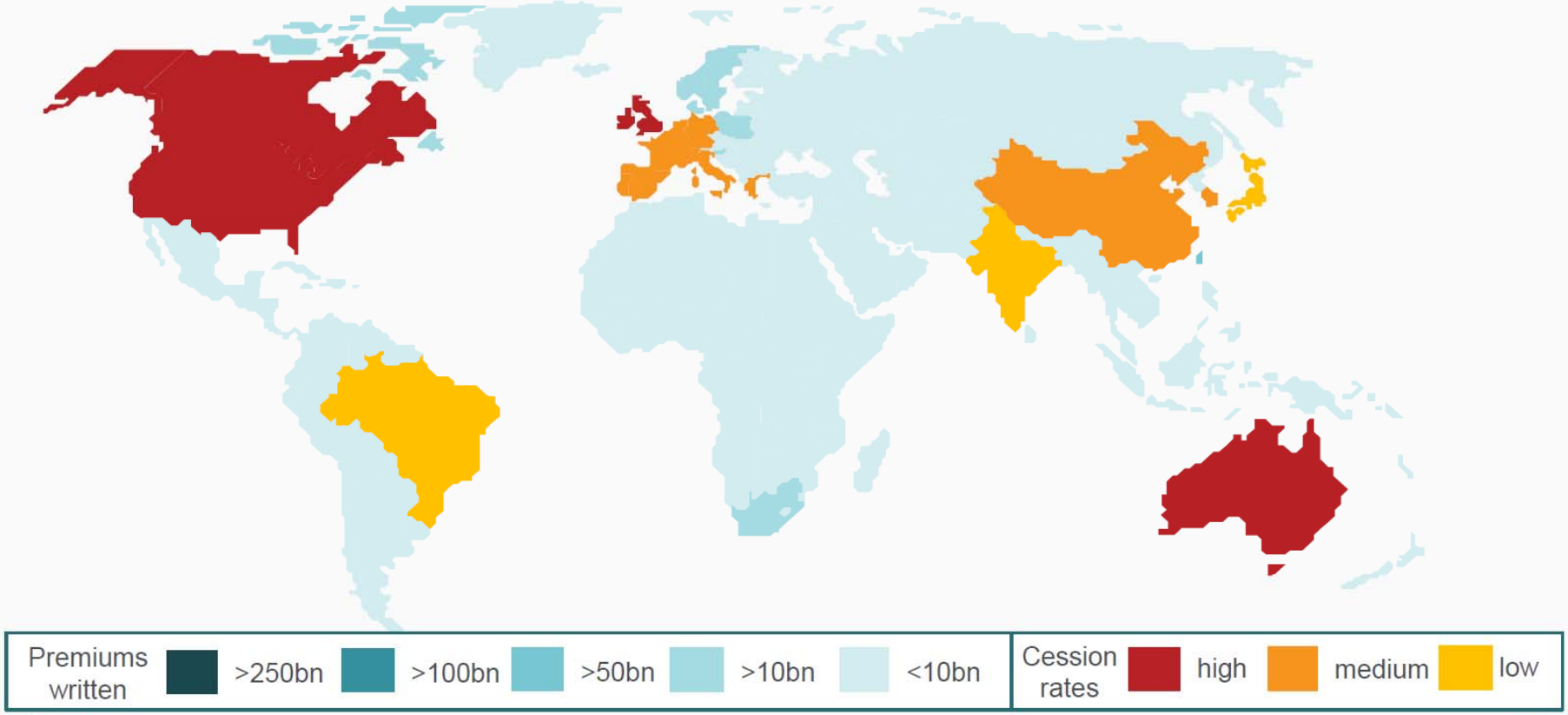


Motivation is risk transfer

Motivation is to improve balance sheet or finance growth

Cession Rates – market maturity & regulation impact cession rates

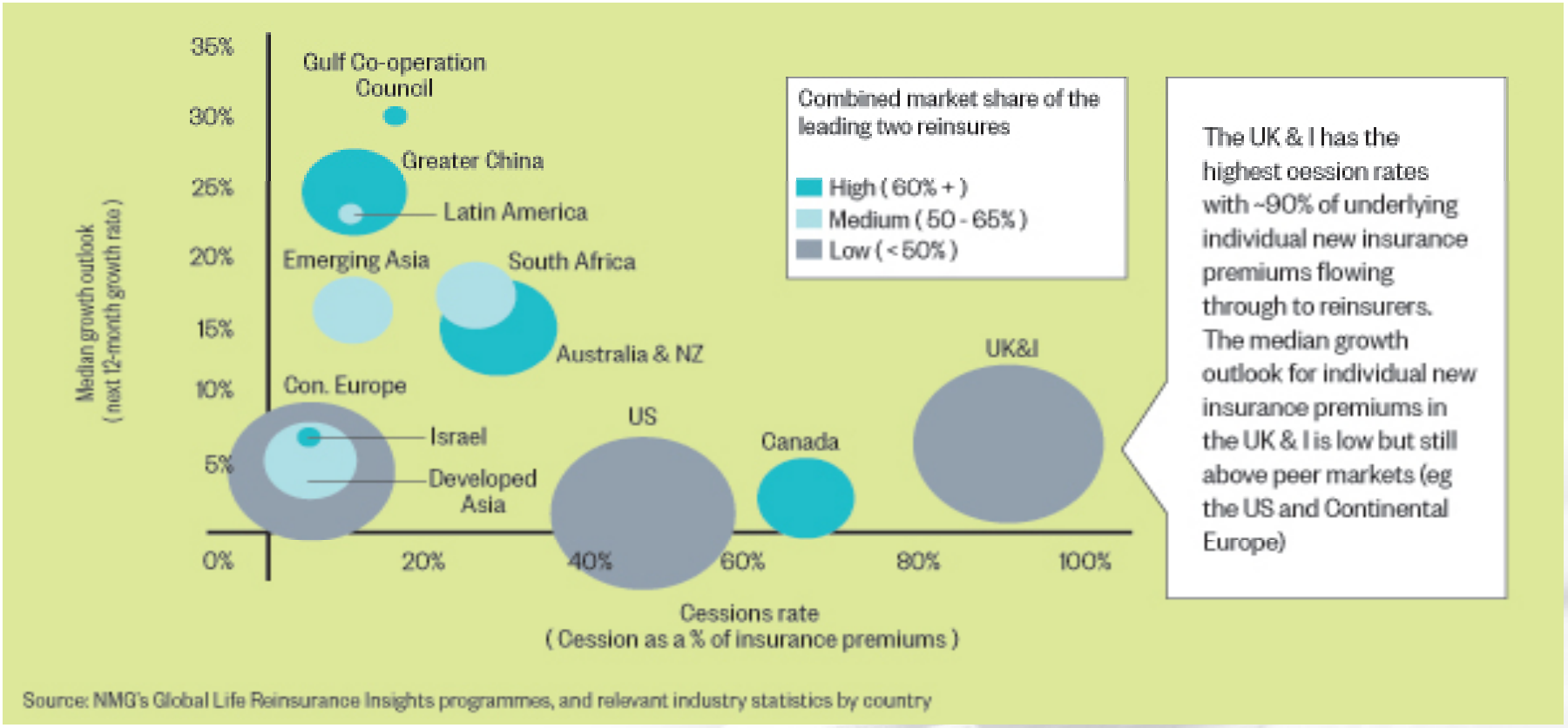
Worldwide cession rates on estimated risk premium[1,2,3]



Increasing cession rates in Asia to be expected

[1]Source: Munich Re
[2]Note: In many markets cession rates differ significantly between the various risk types and/or blocks of business (e.g. group v. individual)
[3] Note: Figures for Canada and US for individual life only

Cession Rates & Growth Outlook….



Source: NMG's Global Life Reinsurance Insights programmes, and relevant industry statistics by country

US Cession Rates…

US ordinary individual life insurance sales (2002-2011)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
% Reinsured	61.5%	59.7%	56.2%	47.0%	39.9%	36.1%	35.2%	34.2%	30.2%	27.3%
Amt Retained	675	705	809	952	1,089	1,207	1,212	1,148	1,168	1,229
Amt Reinsured	1,078	1,043	1,037	844	724	683	658	596	505	461

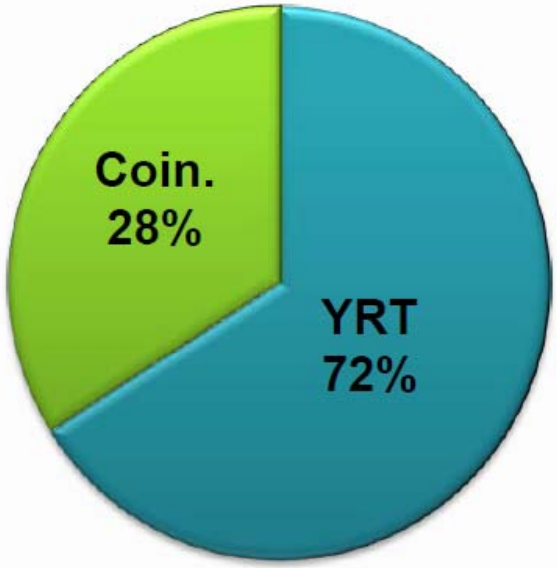
Life Reinsurance data from the 2011 Munich Re Survey

By David M. Bruggeman

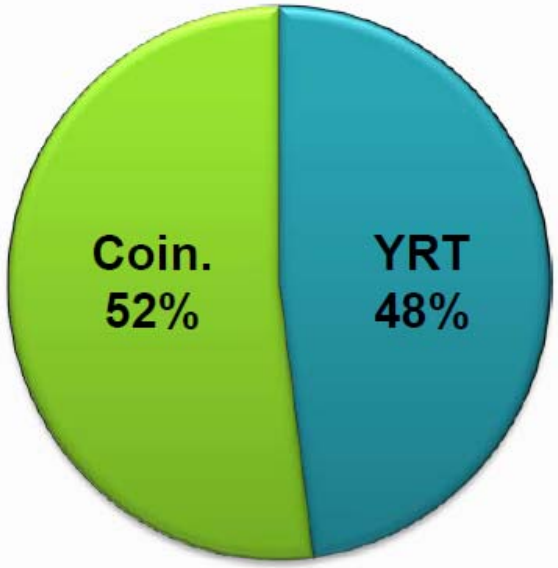
US Life Reinsurance Structures…….

The percentage of coinsurance new business has dropped from 37% in 2009 to 34% in 2010 to 28% in 2011.

2011 New Business



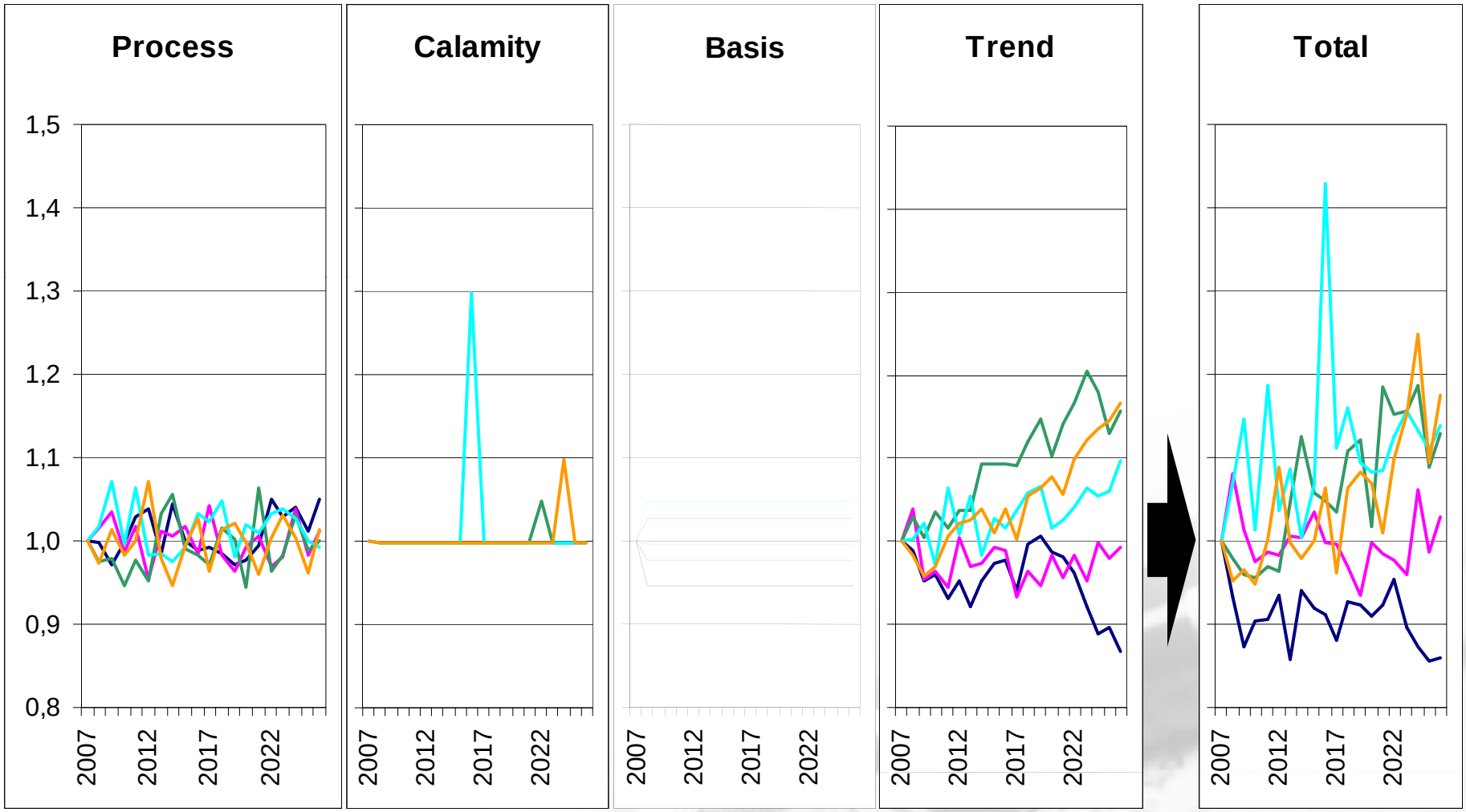
2011 In Force



Life Reinsurance data from the 2011 Munich Re Survey

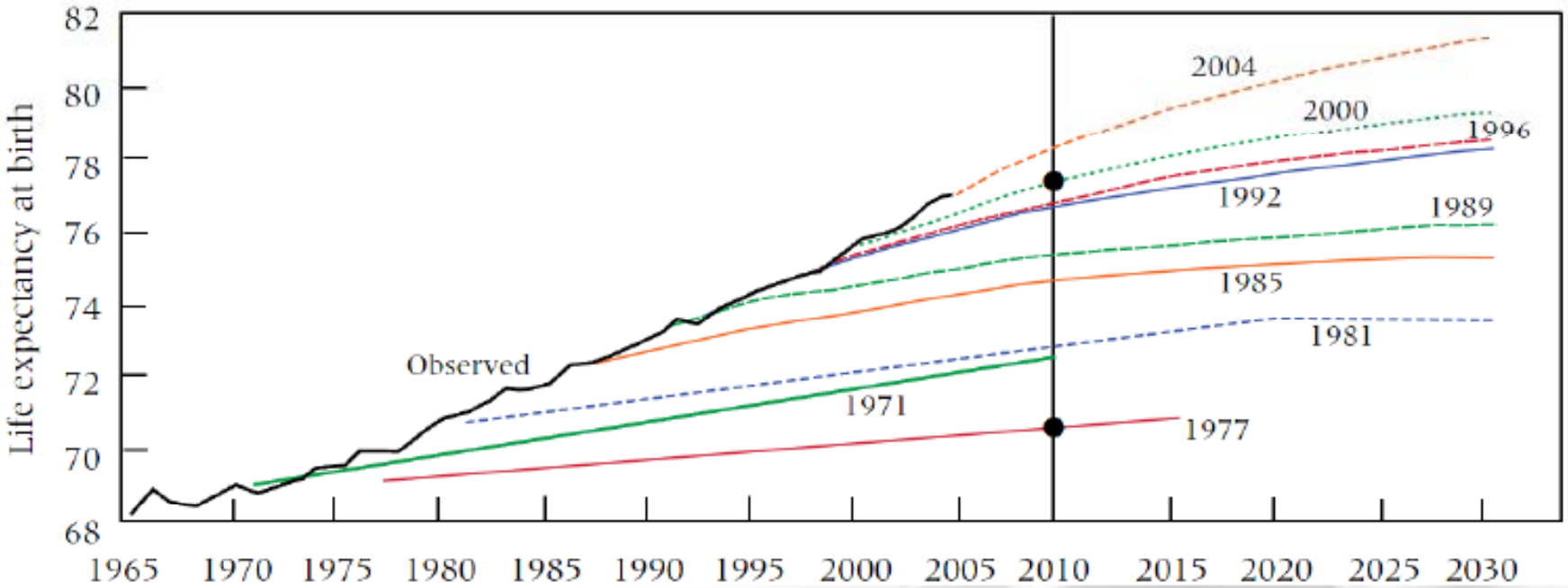
By David M. Bruggeman

The Decomposition of Biometric Risk….



Trend Risk – e.g. Longevity Risk

Actual and projected life expectancy at birth, UK Males

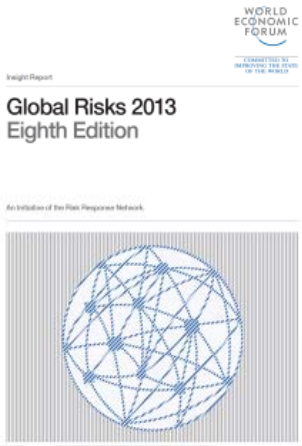


Source: Chris Shaw, Fifty years of United Kingdom national population projections, how accurate have they been?, Population trends 128, 2007

Calamity Risk – e.g. Extreme Weather or Pandemic Risk

Figure 2: Global Risks Landscape 2013

Source: World Economic Forum



Calamity Risk – Mortality Shocks

- natural catastrophes
  - floods
  - storms
  - earthquakes
  - tsunamis
  - heat waves & drought
  - avalanches, etc.
- man-made disasters
  - major fires/explosions
  - aviation disasters
  - rail disasters
  - terrorism, etc.

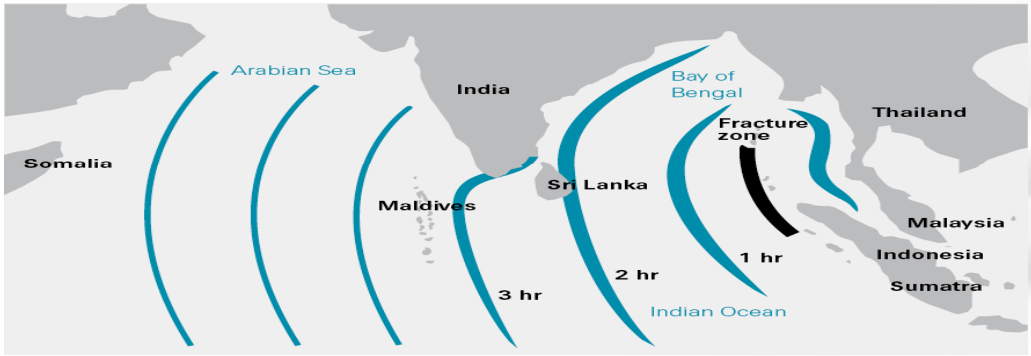
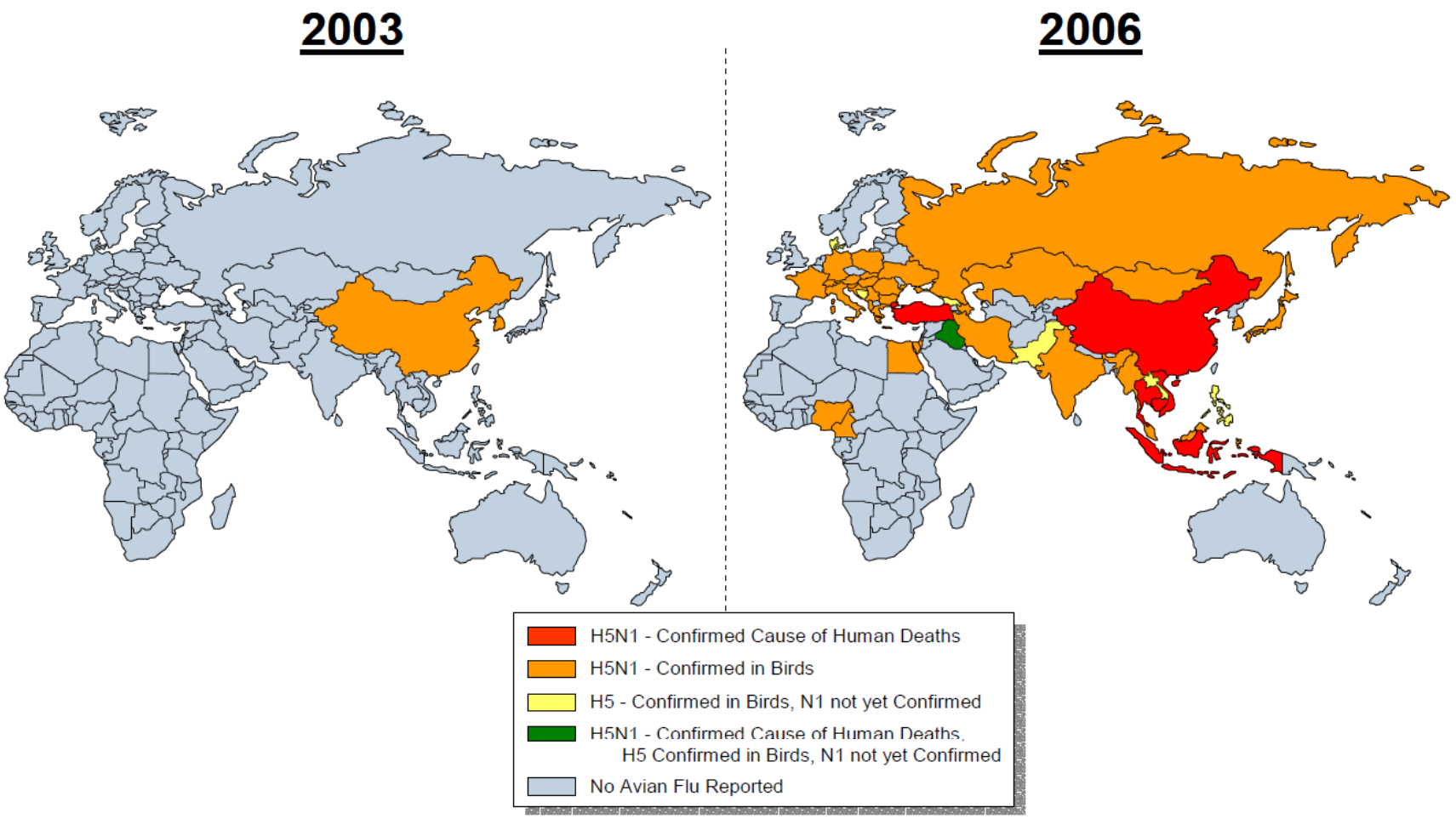


FIGURE 3: NEGATIVE MORTALITY SHOCKS DURING THE LAST CENTURY

Year	Event	Location	Deaths
1902	Volcano	Martinique	40,000
1908	Earthquake	Messina	75,000
1914	WW1	Worldwide	16,000,000
1918	Flu epidemic	Worldwide	20,000,000
1919	Volcano	Kelut	5,000
1923	Earthquake	Kanto	150,000
1931	Flood	China	3,700,000
1939	WW2	Worldwide	50,000,000
1950	Korean War	Korea	5,000,000
1954	Flood	Iran	10,000
1965	Vietnam War	Vietnam	3,000,000
1970	Earthquake	Peru	50,000
1971	Flood	Vietnam	100,000
1976	Earthquake	Tangshan	500,000
1984	Chemical plant	Bhopal	6,500
1985	Earthquake	Mexico City	10,000
1985	Volcano	Bogota	25,000
1987	Nuclear plant	Chernobyl	8,000
1988	Earthquake	Armenia	25,000
1990	Earthquake	Gilan, Iran	40,000
1993	Earthquake	India	22,000
1995	Earthquake	Kobe	6,500
2001	Earthquake	Gujarat	15,000
2001	Terrorism	New York	3,500

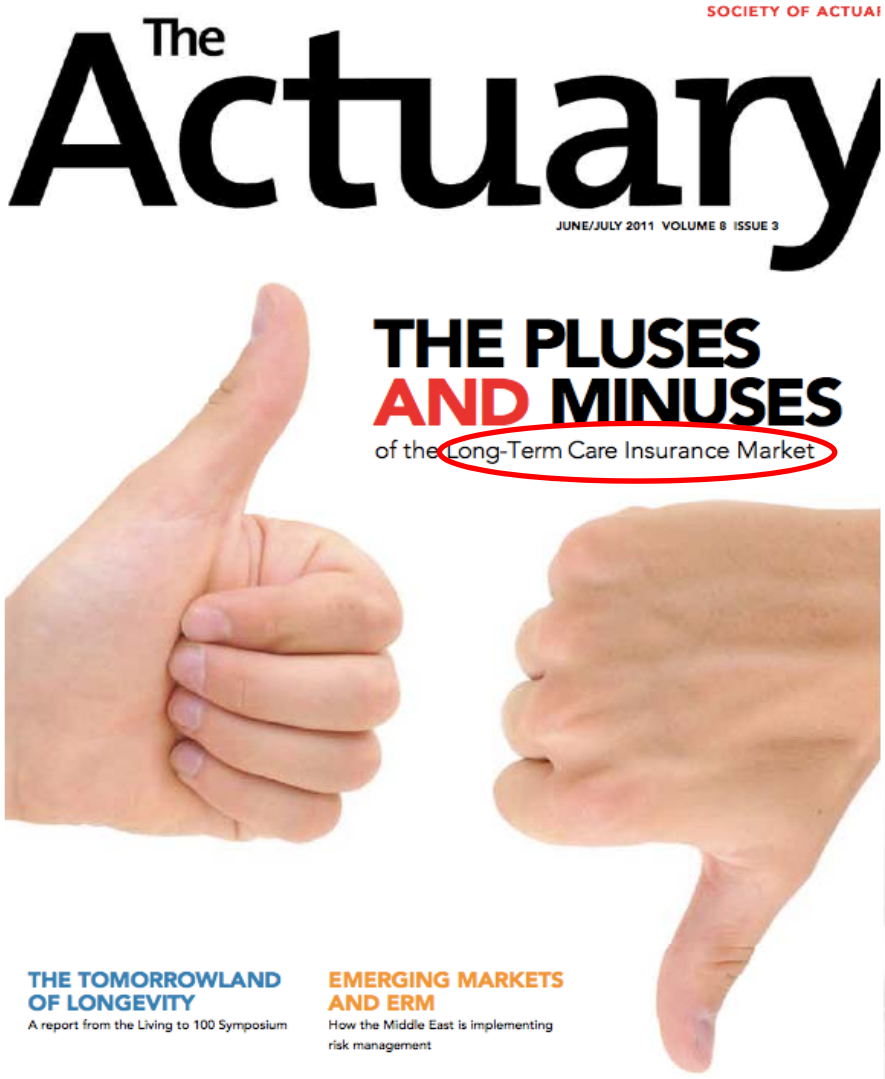
SOURCE: The Review Worldwide Reinsurance

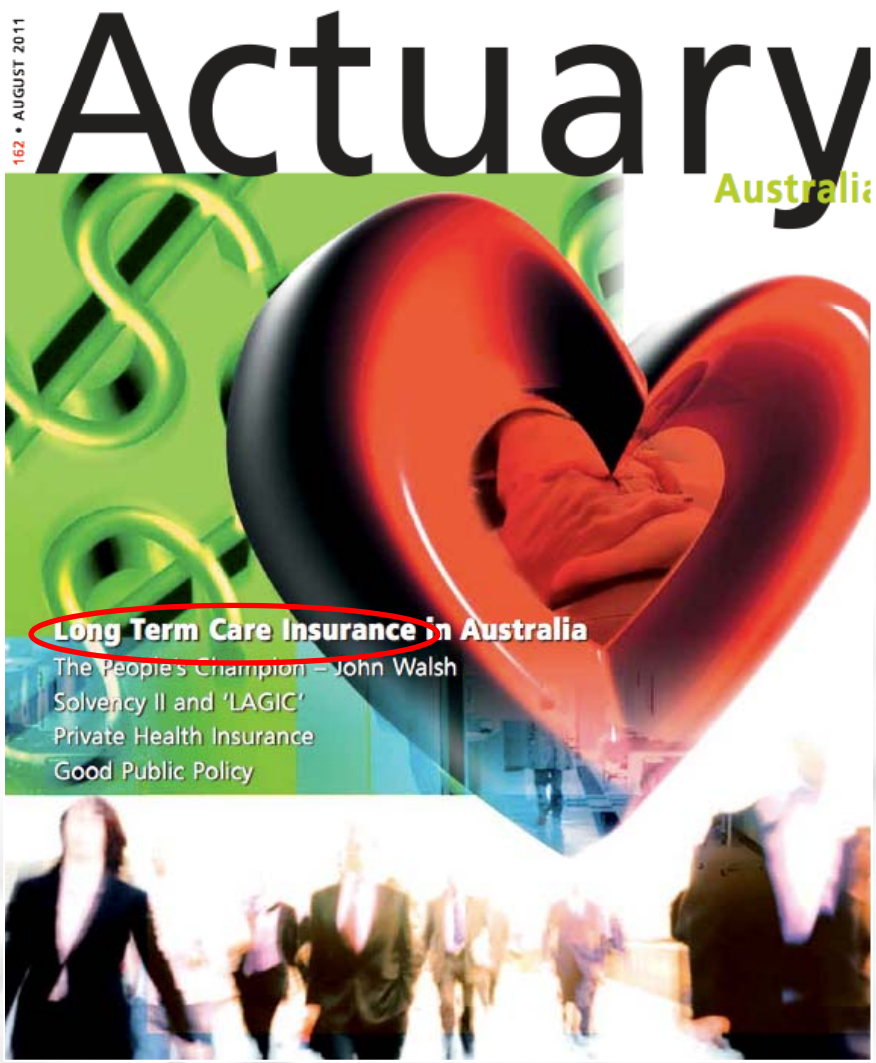
Calamity Risk – e.g. Pandemic Risk



Source: World Organization for Animal Health and the World Health Organization, as of March 17, 2006

Basis Risk – LTC Case Study…





Basis Risk – LTC US Case Study…

Basis Risk – LTC US Case Study…

Driver	Sensitivity	Risk	Problems
Lapse	High	Medium	**Lower than expected**
Active Lives mortality	High	Medium	**Not identified separately**
Claim number	High	**High**	
Claim recoveries	High	**High**	
Disabled Lives Mortality	High	**High**	**Included with claim recoveries?**
Claim expenses	High	High	Own costs, inflation expectations
Modeling	High	?	Interactions are oversimplified.
Interest	High	Hedged ?	Most companies assume earn spread. Rates lowered, large economic losses.
Expenses	Medium	Low	
Regulation	Medium	Rising?	Rate increases get argued down. Some regulators may limit rate increases.

Basis Risk – LTC US Case Study…

1. Products heavily **reinsured** – but capacity now limited.
2. importance of having rates flexibility – i.e. **cannot guarantee** LTC premium rates
3. lower **lapses** for lapse supported products
4. importance of **dementia** claims and dynamics around this (uw; trends; etc.)
5. importance of **mortality** assumptions – for Active & Disabled Lives
6. market dynamics and **competition** can result in irrational behavior
7. pricing **actuaries** must be on the same page as the **underwriters** & **claim managers**
8. future **trends** are not to be underestimated

Shield against costs of long-term care

The costs can be hefty, thus the need for ElderShield and supplementary cover

Lorna Tan
Senior Correspondent

As our society ages, the issue of long-term care becomes an ever-more pressing concern for many people.

The proportion of the population aged 65 or older is now 7.3 per cent and is expected to reach 19 per cent by 2030.

This means an increase from 235,000 elderly people in 1999 to about 796,000 in 2030.

Long-term care can be lengthy and expensive, which was why ElderShield – a severe disability insurance scheme – was introduced in 2002 to provide some financial protection.

ElderShield works on an opt-out basis, with premiums funded out of Medisave.

The scheme has undergone changes and, since 2007, supplementary covers – which are on an opt-in basis – have been launched to provide additional layers of protection.

ST PHOTO: NG SOR LUAN

The proportion of elderly people is expected to reach 19 per cent by 2030. As long-term care can be lengthy and expensive, experts feel it is prudent for the young to begin planning early.

Basis Risk – Australian DI Case Study…

Commonwealth bank

… continuing adverse experience in disability products…

Dec 2011 Profit release

Asteron

… unfavourable disability claims experience…

Jun 2011 annual report

Munich Re

… reserve strengthening for Australian disability business of …

Sept 2011

AMP

… AXA Australian income protection book was put into loss recognition with capital losses recognised on merger…

Dec 2011 Investor report

Hannover

… claims experience from Australian disability annuity business was unusual… additional expenditure in the low-double-digit million euros was incurred…

Jul 2011 Update

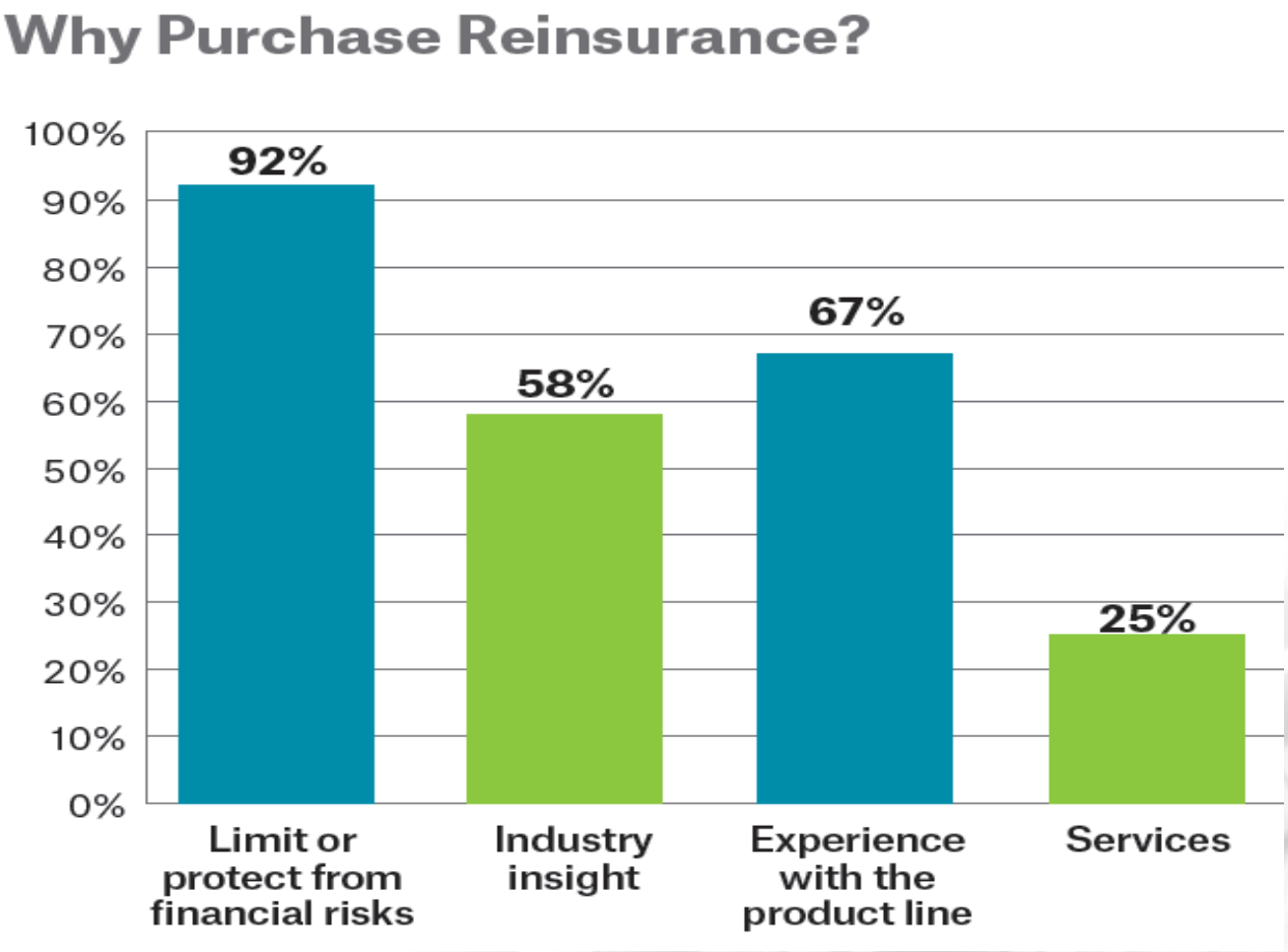
Basis Risk – Australian DI Case Study…

- Disability income products have been **popular** in Australia
- Individual disability (**IDI**) covers were m… popular than Group disability
- Lenient **definition** – worsen…
- Generous **benefit** fe…
  - agreed val…
  - high…
  - …
- …and
- …using NML's and …rating
- …**nagement**
- **R…nce** – alignment of interests & capacity may be limited.

Result

1. **Huge losses; substantial increase in reserves;**
2. **Rate reviews leading to substantial increases in premiums**
3. **Several direct writers and reinsurers exited the market;**
4. **But surprisingly very few changes to the benefit design; very little improvement in risk management**

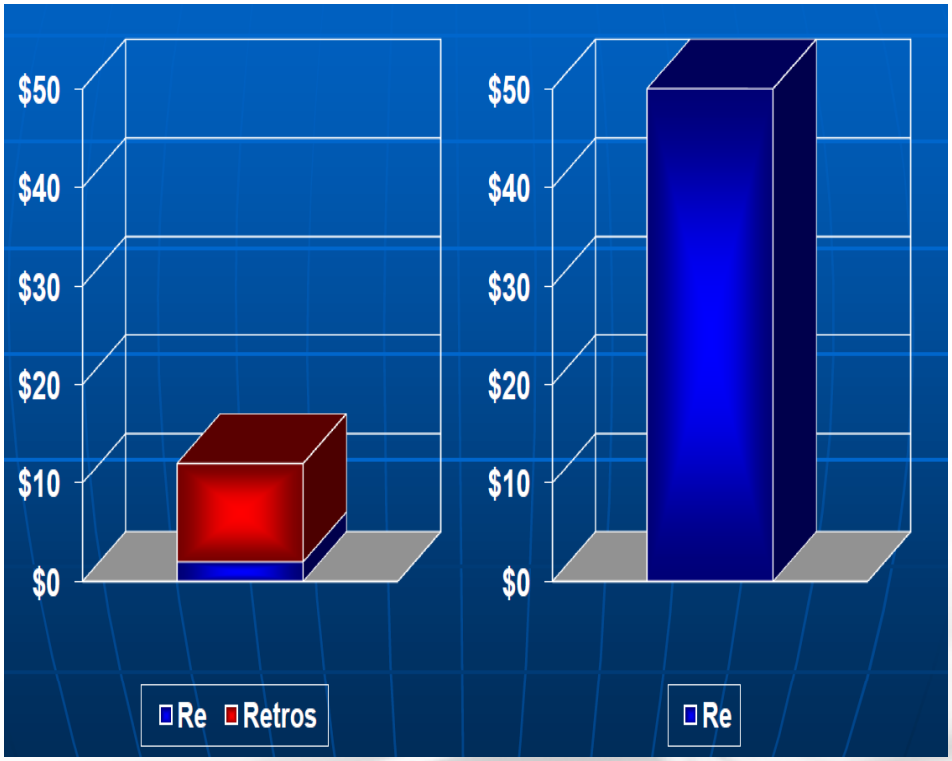
Basis Risk – US IDI Survey…



Source: Munich Re America Life 2012 IDI Survey

Process Risk – Large Fac Cases…

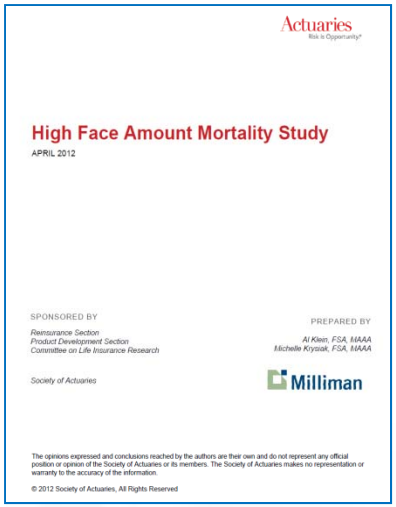
- Increased need in market for capacity
- High Net Worth (HNW) Market
- Insurers seeking capacity from their key reinsurers
- Insurers looking for "one stop shop"



Process Risk – High Face Amounts…

Figure 6.4.1. Policy Size: Cause of Death Percentage and Count
Policy Size ≥ $100K

	Policy Size							
Cause of Death	$100K To <$250K	$250K To <$500K	$500K To <$1M	$1M To <$2.5M	$2.5M To <$5M	$5M To <$10M	$10M+	Total
Cancer	36.8%	37.3%	36.2%	36.8%	37.9%	40.8%	42.6%	36.9%
Cardiovascular	25.4%	23.2%	23.1%	21.9%	21.1%	22.0%	23.4%	24.6%
Respiratory	8.5%	6.6%	5.8%	5.8%	7.8%	7.2%	4.3%	7.8%
Mental & Nervous	4.4%	4.4%	4.1%	3.8%	4.5%	3.6%	2.1%	4.3%
Stroke	3.3%	3.4%	3.4%	3.4%	5.2%	3.1%	4.3%	3.3%
Digestive	2.3%	1.8%	1.5%	1.5%	1.3%	1.3%	0.0%	2.1%
Infectious	1.8%	1.5%	1.5%	1.2%	0.9%	0.4%	0.0%	1.7%
Genitourinary	1.3%	1.1%	0.9%	0.9%	0.7%	0.0%	0.0%	1.2%
Childbirth	0.1%	0.0%	0.2%	0.5%	0.9%	0.4%	0.0%	0.1%
Diabetes & Metabolic	0.9%	0.6%	0.6%	0.5%	0.7%	0.0%	0.0%	0.8%
Blood & Immune	0.2%	0.2%	0.2%	0.3%	0.0%	0.4%	0.0%	0.2%
Motor Vehicle Accidents	2.7%	3.5%	4.2%	3.2%	3.1%	1.3%	4.3%	3.0%
Other Accidents	3.5%	5.8%	6.5%	6.9%	7.8%	6.7%	4.3%	4.4%
Suicide	2.7%	4.4%	5.6%	6.2%	5.2%	5.8%	8.5%	3.5%
Homicide	0.6%	0.8%	1.2%	1.2%	0.2%	1.8%	0.0%	0.7%
Other	5.6%	5.6%	5.2%	6.0%	2.7%	4.9%	6.4%	5.6%
Total Percentage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Count	56,131	15,945	7,214	3,686	446	223	47	83,692


Actuaries

High Face Amount Mortality Study

APRIL 2012

SPONSORED BY

Reinsurance Section
Product Development Section
Committee on Life Insurance Research

PREPARED BY

Al Klein, FSA, MAAA
Michelle Krysiak, FSA, MAAA

Society of Actuaries

Milliman

The opinions expressed and conclusions reached by the authors are their own and do not represent any official position or opinion of the Society of Actuaries or its members. The Society of Actuaries makes no representation or warranty to the accuracy of the information.

© 2012 Society of Actuaries, All Rights Reserved

Summary – Reinsurance – a tool for risk management…