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CONFÉRENCE / RÉASSURANCE

Longevity Panel – Trends and Developments in Longevity Risk Transfer



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Chair - Wayne Daniel
Panel - Roland Johnson
- Gordon Fletcher
- Gavin Jones



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Longevity Risk Transfer

- Overview of Longevity Risk
 - Longevity risk exists in insurers annuity portfolios and defined benefit pension schemes.
 - Over the last decade or two, managers have dealt with many other risks, including
 - asset-liability matching
 - interest and inflation
 - equity and creditusing Liability Driven Investment strategies



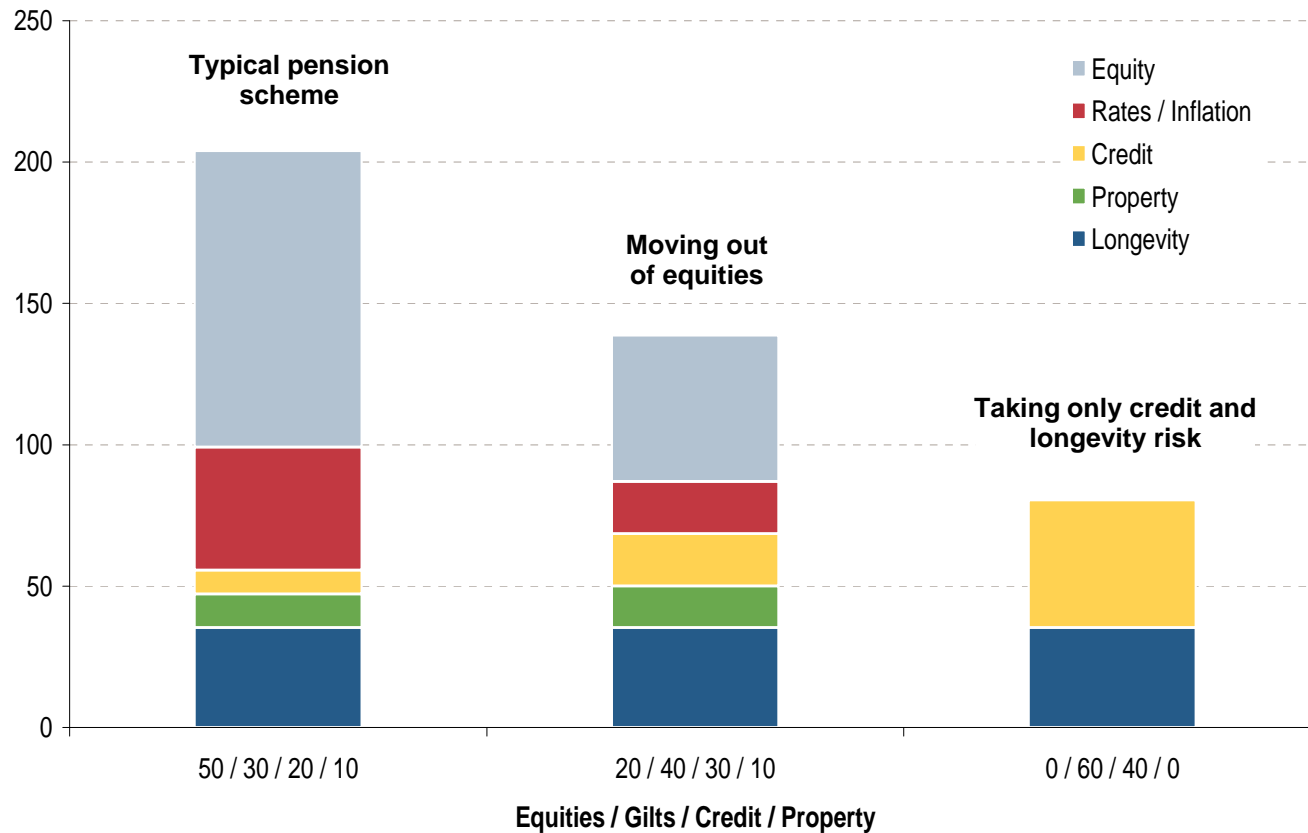
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Pension Funds – De-risking

As pension schemes de-risk eg. by switching from equities to bonds, longevity risk looms larger as an issue



**Roland Johnson
VP, Longevity Benefits
RGA Life Reinsurance
Company of Canada**



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Longevity Risk Transfer



From Canadian Viewpoint



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Why Longevity Now?

□ Demographic and economic environments

- Population aging, with significant mortality improvements
- Risk of living too long will become more important than risk of dying too soon
- Baby boomers moving from active employment to retirement
- Low interest rate combined with high volatility equity markets



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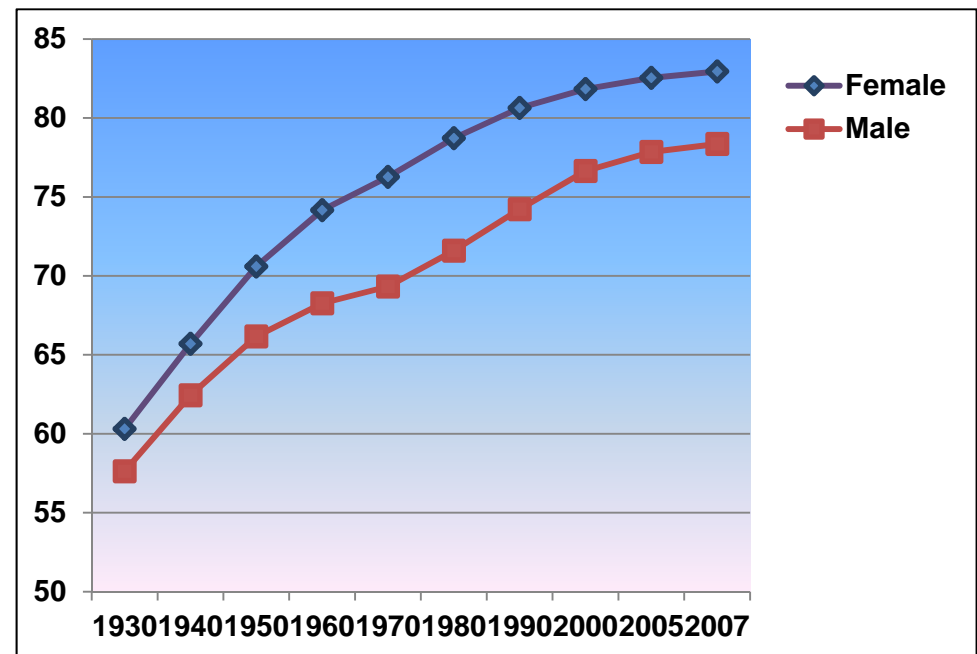
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Canadian Historical Life Expectancies

At Birth

- Significant increased over last century
- Continuing to increase for both males and females
- But slower pace for females since 1975



Source: Statistics Canada

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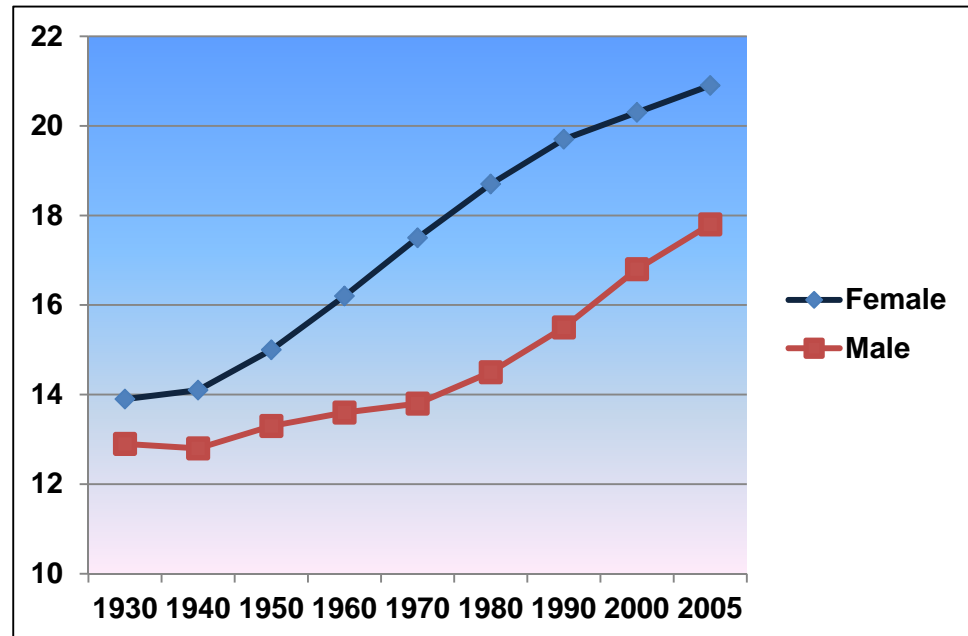
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Canadian Historical Life Expectancies

At Age 65

- Significant increased over last century
- Continuing to increase for both males and females
- But slower pace for females since 1975



Source: Statistics Canada



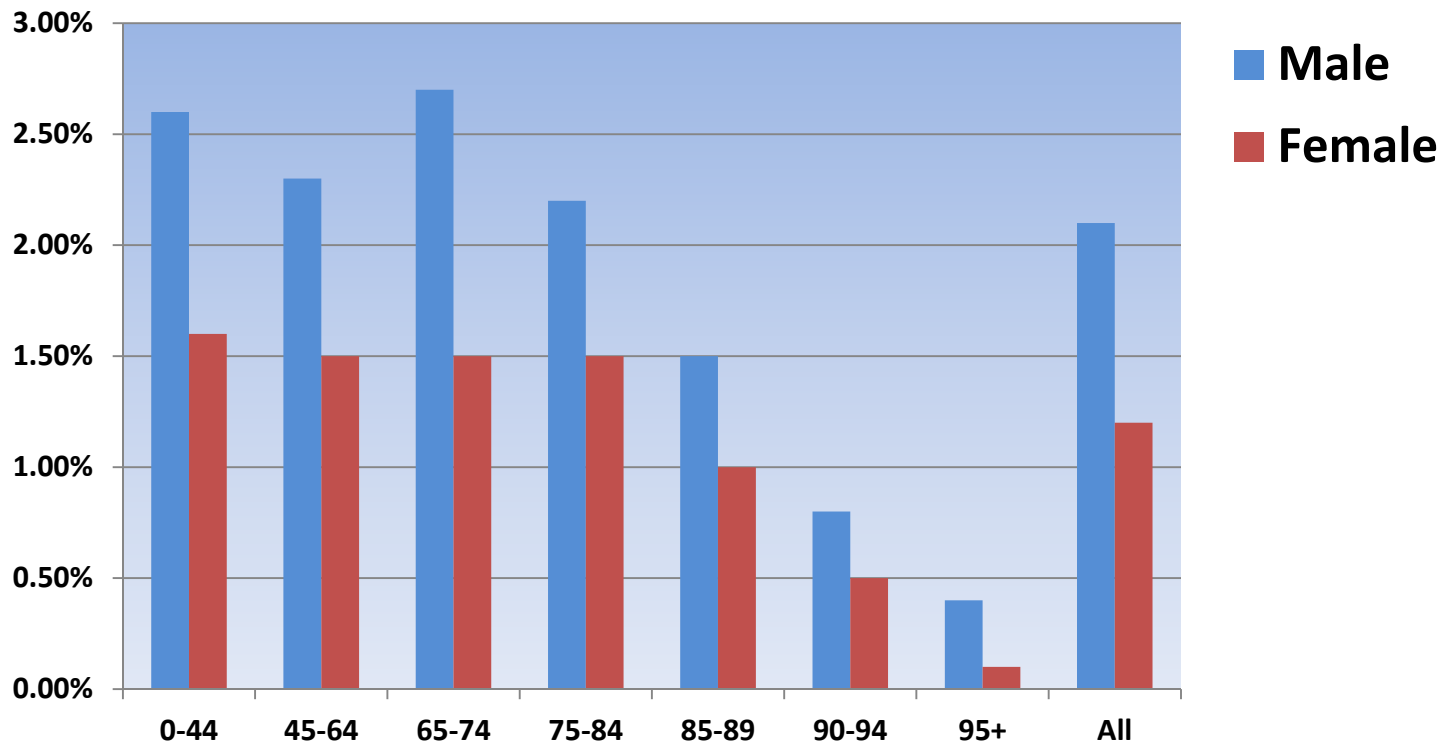
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Canadian Mortality Improvement

1991 to 2006 Average Annual Improvements Rates



Source: OSFI – Office of the Chief Actuary



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Longevity Financial Impacts

- Customer's perspective
- Pension Plan's perspective
- Insurer's perspective
- Government's perspective



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Longevity Risk Transfer Structures

Pension buy-out or buy-in

Individual payout annuities

Benefit (indemnity) swap

Coinsurance

Coinsurance with funds withheld

Liability swap (Reverse YRT)

Longevity Bonds

Canada



Market Size in Canada

❑ Registered Pension Plans assets: \$1,003B in 2009

➤ Life Insurance Industry: \$82B

❑ RRSP assets: \$371B in 2009

➤ Life Insurance Industry: \$86B

Source: CLHIA Annuity Report December 2009



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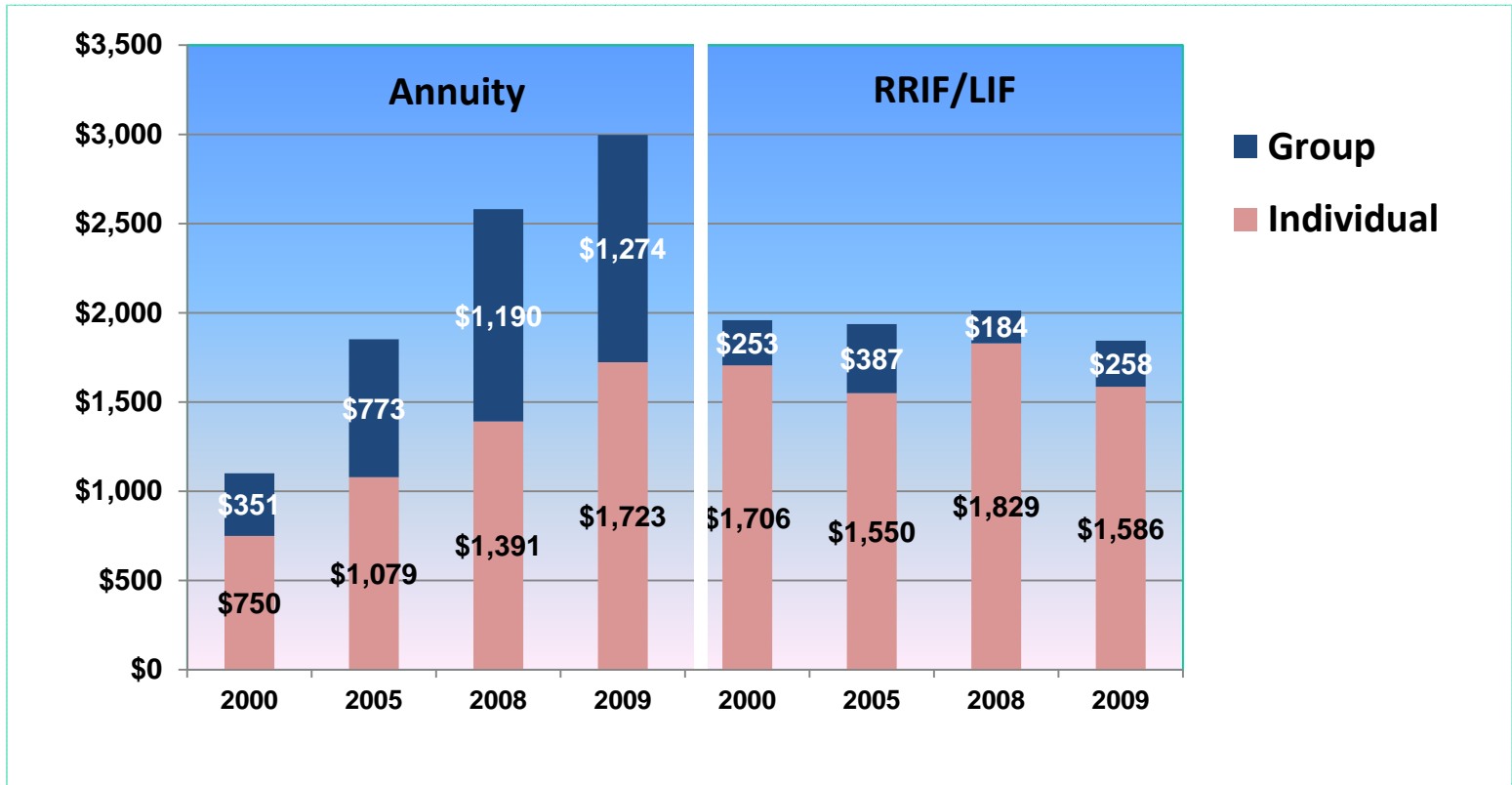
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Market Size in Canada - Payout Annuities

Life Insurance Industry - New Premiums

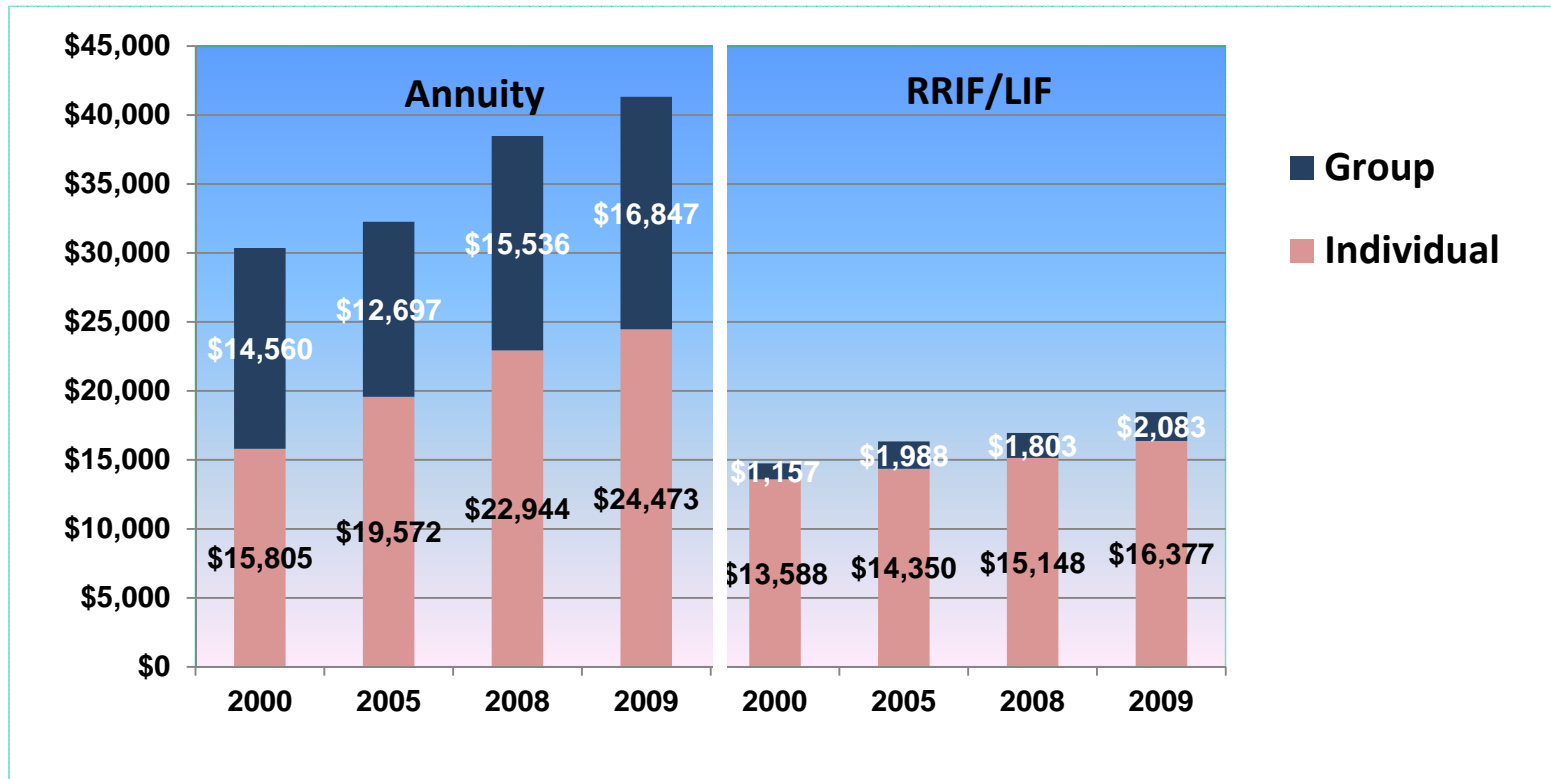


Source: CLHIA Annuity Report December 2009



Market Size in Canada - Payout Annuities

Life Insurance Industry - Assets



Source: CLHIA Annuity Report December 2009



Pension Buy-out & Buy-in

- ❑ Pension plan pays single premium to insurer
- ❑ Pension liabilities/risks transferred to insurer

- ❑ Buy-out:
 - Pension payments directly from insurer to annuitants
 - Contract between insurer and each annuitant
- ❑ Buy-in:
 - Pension payments (bulk) from insurer to pension plan
 - Pension plan continues to pay annuitants



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Individual Payout Annuities

- Contract between insurance company and policyholder
- Single premium

- Annuity payment
 - Fully guaranteed, or
 - Guaranteed payment portion combined with variable payment portion that can fluctuate with market, or
 - Minimum guaranteed payment with potential income growth



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Longevity Benefit Swap

True risk transfer

- ❑ Premiums = Expected benefit payments (fixed leg)
+ Risk premium
 - Fixed up front
 - Payable by Client (Pension plan or Insurance company)

- ❑ Benefits = Actual benefit payments
 - As per contractual obligation toward policy owner
 - Payable by (Insurer or Reinsurer)

Net cash flows exchanged

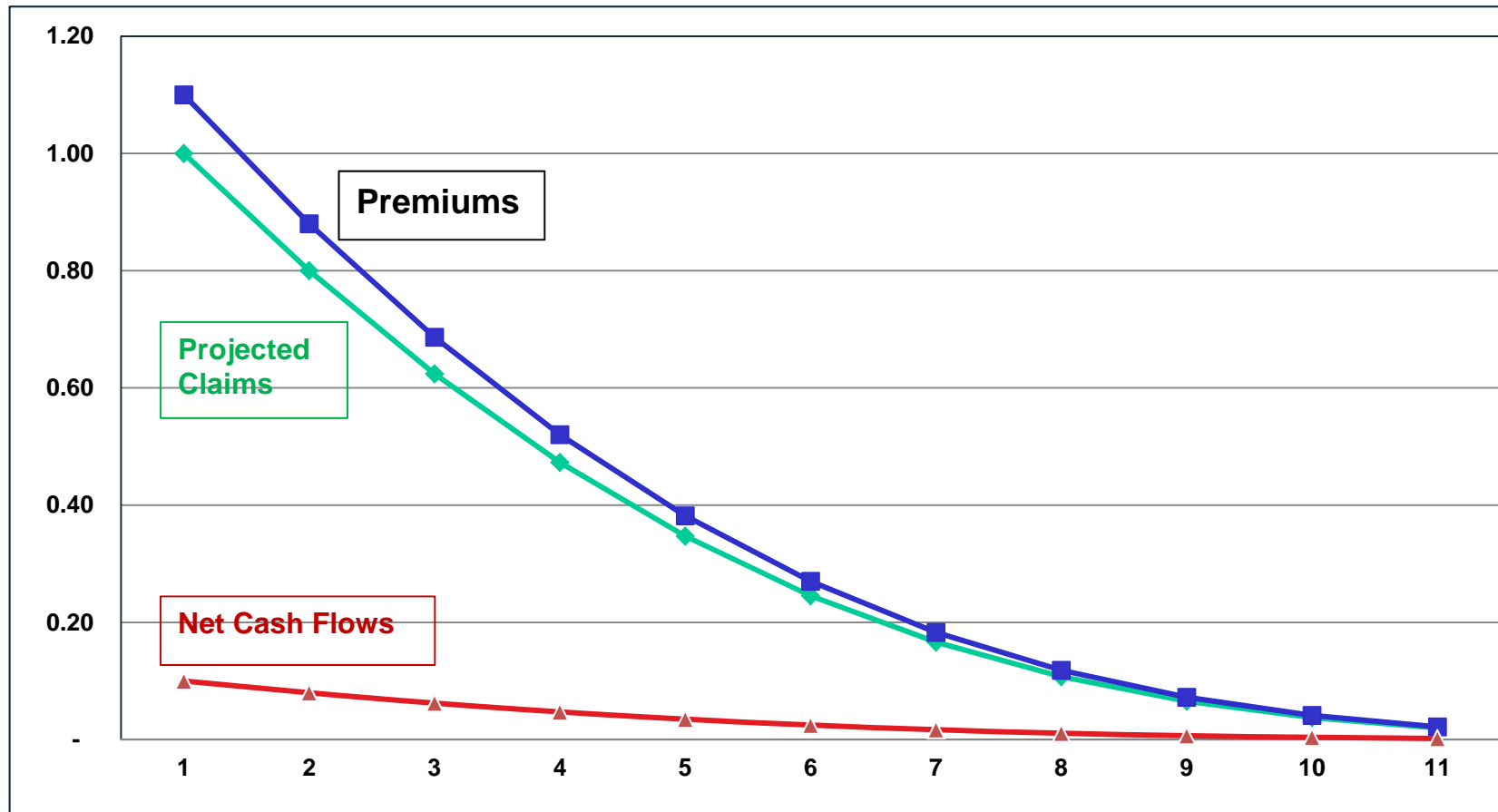


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Longevity Benefit Swap



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Longevity - Risks

- Misestimating base mortality
- Misestimating future mortality improvements
- Mortality volatility
- Annuities could continue to be paid to the deceased
- Counterparty



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Canadian Mortality Studies

- ❑ CIA Individual Annuitant Mortality Experience
 - Coming out soon 1996-2006
 - Comparing with 1983 IAM Basic Table
 - CIA currently working to produce Canadian table
- ❑ Canada Pension Plan Mortality Study
- ❑ Pension Plan
 - UP94 (US Table)
 - RP 2000 (US Table)
 - CIA currently working to produce Canadian table
- ❑ Canadian Population – Statistics Canada



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Longevity Reinsurance Deal - Canada

- ❑ One large deal done in 2010
 - 60% of group annuity block of business (\$2.5B)
 - Benefit swap basis



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Gordon Fletcher
Risk adviser
Mercer



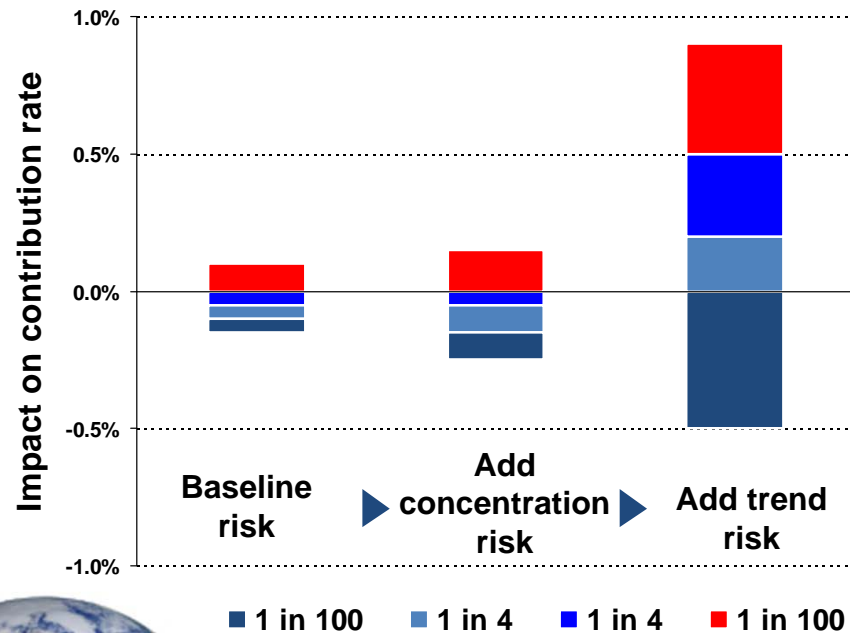
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Pension plans and longevity

- Pension plans now more sophisticated in *measurement*



- Pension plans now more sophisticated in *management*
- Around 12 public longevity deals in the UK
- Recent first deal on non-retired members with longevity index
- Comparison with US



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Gavin Jones
Senior Longevity Actuary
Swiss Re

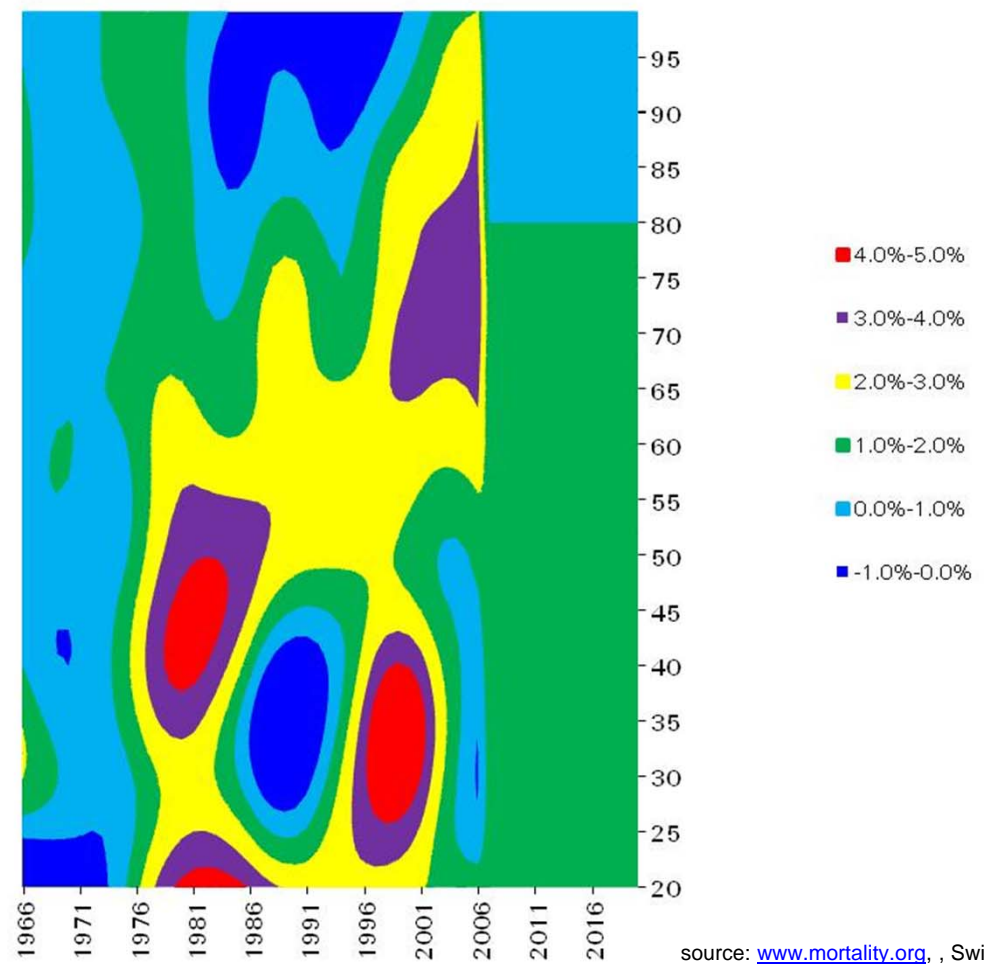


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Historic Canadian Male improvements with CLIFR AA scale modification



source: www.mortality.org, Swiss Re calculation
Canadian Institute of Actuaries

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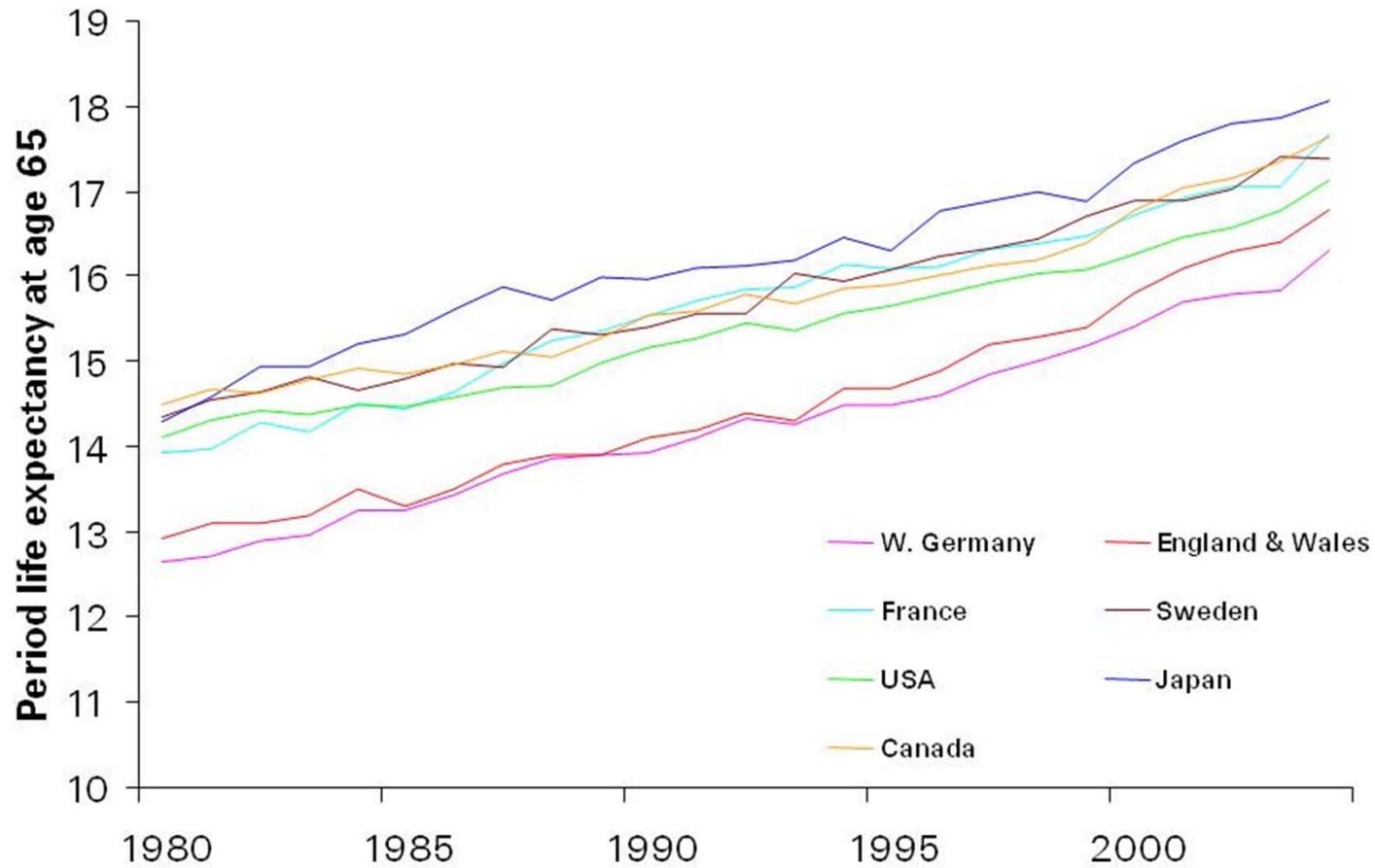


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Male life expectancy at age 65

Risk is systematic in nature



www.mortality.org

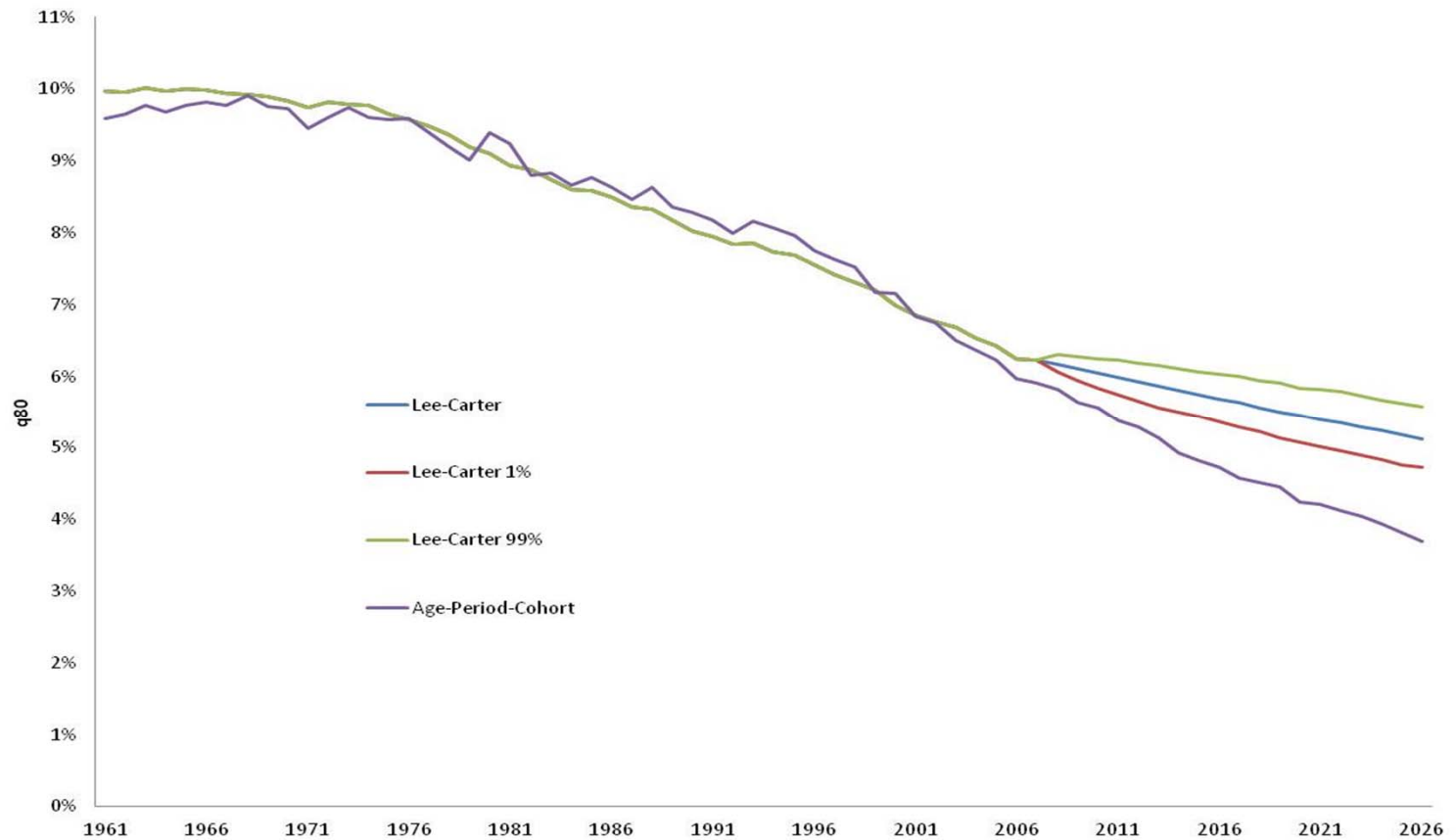


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***“The margin for adverse deviations ... should reflect the uncertainty of that assumption and of any related data.” – CLIFR
Canada Male age 80 – Mortality projection two models***



source: www.mortality.org, Swiss Re calculation

Life expectancy age 65 in years:

Lee-Carter model 19.0, Age-Period-Cohort model 21.5, UP94@2020 19.4

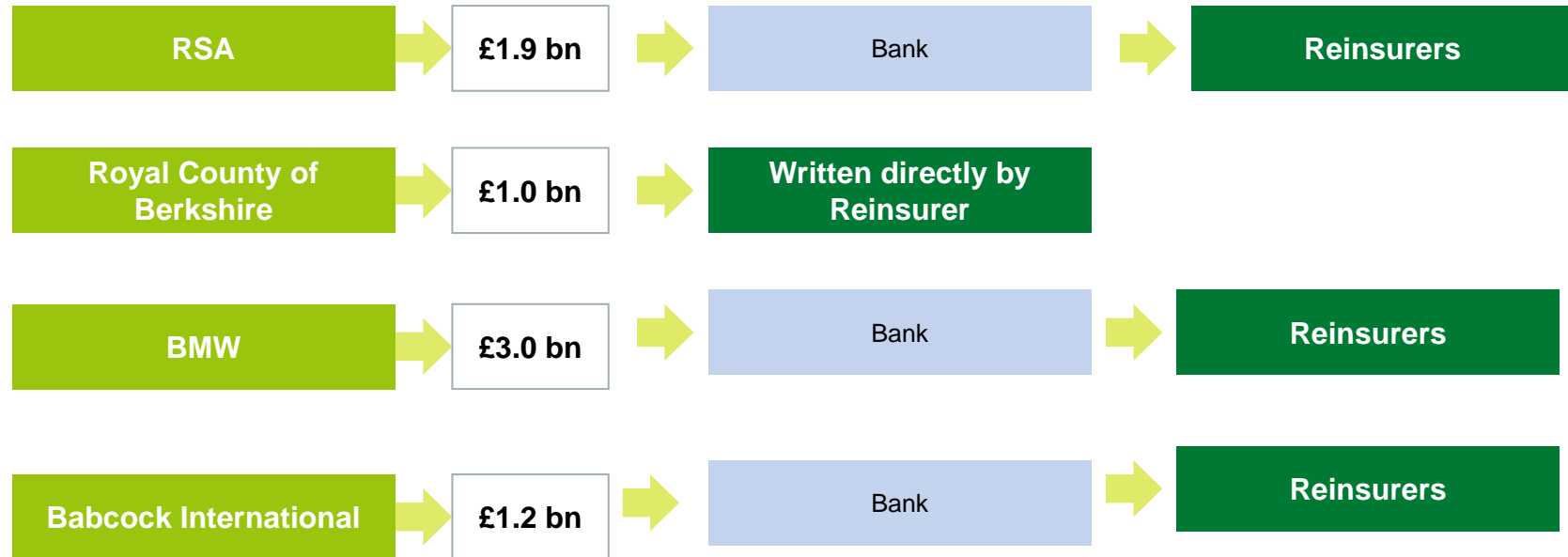


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Where does longevity exposure end up?



Reinsurer capacity is finite but there is plenty of it for now.

Total assets backing longevity liabilities worldwide: \$20Tr

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Finite capacity, disproportionate demand

UK corporate pension liabilities	Proportion of UK corporate pension liabilities insured each year	UK Life Companies' annuity reserves
GBP1.4 trillion	Under 1%pa	GBP 150bn

Although the bulk annuity market is growing, activity is still small in comparison to the total pensions market

- At the end of 2010 approx GBP 35 billion of pension liabilities had been transferred through bulk annuity buyouts

There is insufficient capacity in the insurance market to absorb the future demand for longevity risk transfer from UK pension plans alone



Ultimately longevity risk supply greater than capacity of insurance sector

- Swiss Re has entered into a transaction with Kortis Capital Ltd. ("Kortis") to receive up to \$50m of payments in the event of a large increase in the differential in mortality improvements between male lives aged 75-85 in England & Wales and male lives aged 55-65 in the US
- First tradable rated security providing protection against longevity trend risk
- Trigger is based on a longevity divergence index measuring mortality improvements in England & Wales relative to mortality improvements in the US

Management Highlights

"Swiss Re's longevity strategy focuses on providing our clients with indemnity protection, while supporting the development of efficient capital market solutions on an indexed basis as a source of future long-term capacity"

– *Brian Gray, Chief Underwriting Officer, Swiss Re*

"The Kortis programme is of particular note as it provides protection against adverse deviation in mortality improvements for both Swiss Re's mortality and longevity portfolios, whilst taking into account the complementary nature of the two risks"

– *Christian Mumenthaler, Head Life & Health, Swiss Re*



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