ACTUARIAL SOCIETY OF SOUTH AFRICA

Mortality Improvements in South Africa: What is going on?

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Gen Re

2012 CONVENTION 16 – 17 OCTOBER

Agenda

1. Where in the world is Paul
2. Why is this of any relevance to you
3. Why do people die
4. What do we know about South Africa
5. Some scary numbers
6. Where to from here

W

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Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image U.S. Geological Survey
Image © 2012 TerraMetrics
25°00'55.04" N 76°51'25.63" W elev -89 m
Google earth
Eye alt 318.37 km

NGA, GEBCO
Atlas
rapher
elev -4881 m
Google earth
Eye alt 5702.52 km

So why is this important to you?

- ASSA representative on the International Actuarial Associations Mortality Working Group
- (and other things)
- They discuss a lot of interesting, and complicated, stuff

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Mortality assumptions in pensions reserving

IAA MWG: Mortality assumptions used in pensions and annuity reserving 2

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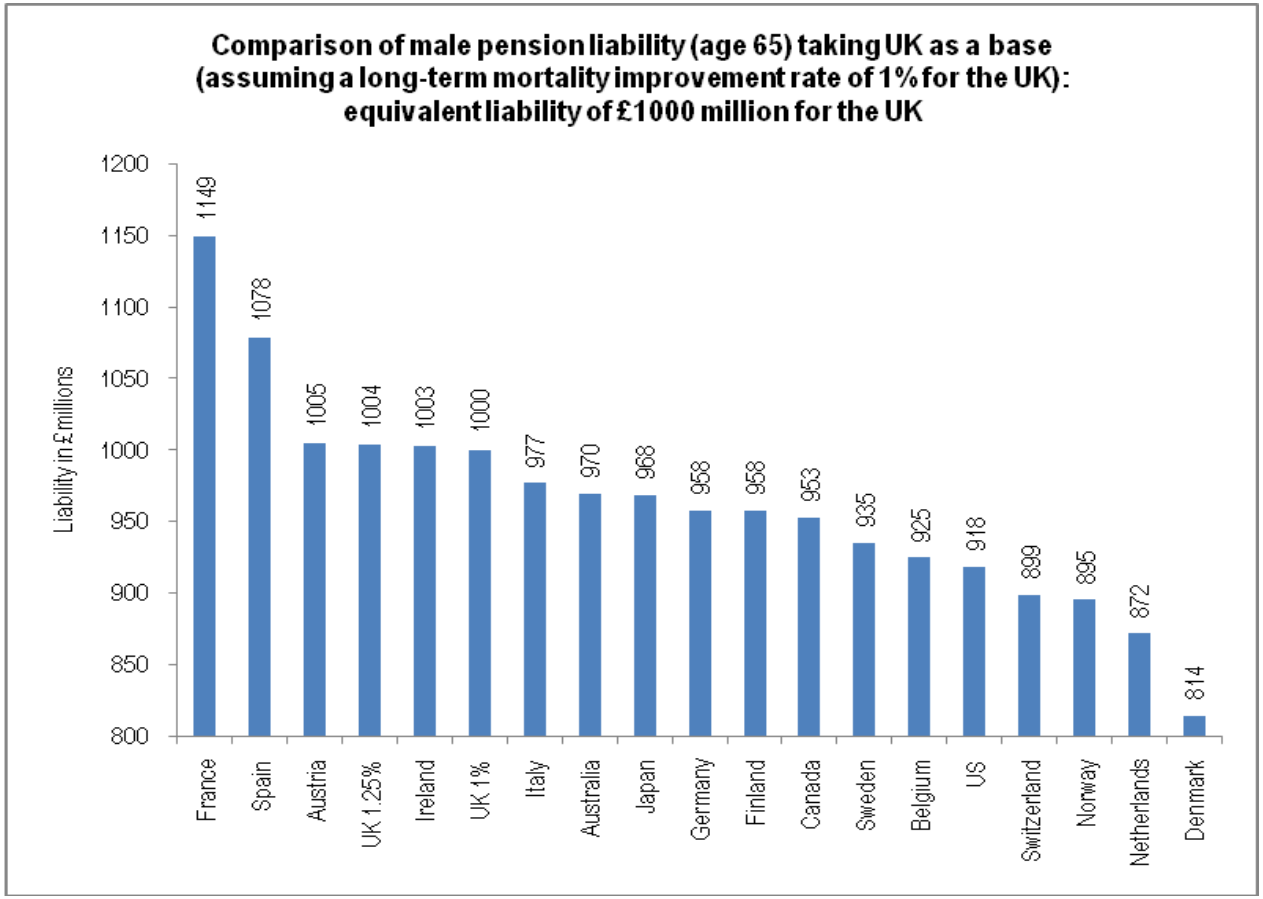
- Compared tables used in valuation vs. population tables
- Evidence of a lack of consistency between countries
- Some countries don't require any assumption of future mortality improvement!
- important implications for actuaries and investors, defined benefit pension liabilities can form a significant item on the balance sheet of many companies

IAA MWG: Mortality assumptions used in pensions and annuity reserving



Australian National University

Healthy Longevity

Bridget Browne

IAA Mortality Working Group Meeting

Zagreb 29-30 September 2011

Compression & Expansion of Morbidity

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	Compression	Expansion
Absolute	Dependent LE Years decrease	Dependent LE Years increase
Relative	Dependent LE as a % of Total LE decreases	Dependent LE as a % of Total LE increases

Example:	Total LE	Healthy LE	Dependent LE	Dependent LE as % of Total LE
Current	25	20	5	20%
Absolute expansion and relative expansion	28	21	7	25%
Absolute is constant with relative compression	28	23	5	18%
Absolute compression and relative compression	28	25	3	11%

Socio-demographics

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- ***Mortality trends*** in recent decades in Eastern and Western Europe: contrasts, correlates and consequences, M Murphy
- Overview of known patterns and trends in longevity, M Glickman
- B1 Examining ***disease based incidence and mortality rates*** within the UK. H Love
- C1 Trends in ***inequalities in life expectancy at age 65*** in England by socio economic circumstances: decomposing change by age and cause of death, 1981-2007. M Bajekal
- D1 From fast food to fast runners: changing mix, clouding conclusions. G Becker and G Lane

International

- A2 ***Uncertainty in modelling mortality***. H v Broekhoven, IAA
- B2 Comparison of ***cause of death trends*** across US, UK, France and Spain. M Didou and J Hartley
- C2 ***Modelling mortality and smoking prevalence*** in developed countries, A Cairns and T Kleinhow

My questions

- Question 1: Why do South African actuaries not seem to care all that much about mortality improvements?
- Question 2: What is actually going on with mortality in South Africa?

- So what is happening in the rest of the world?
- www.worldmapper.org
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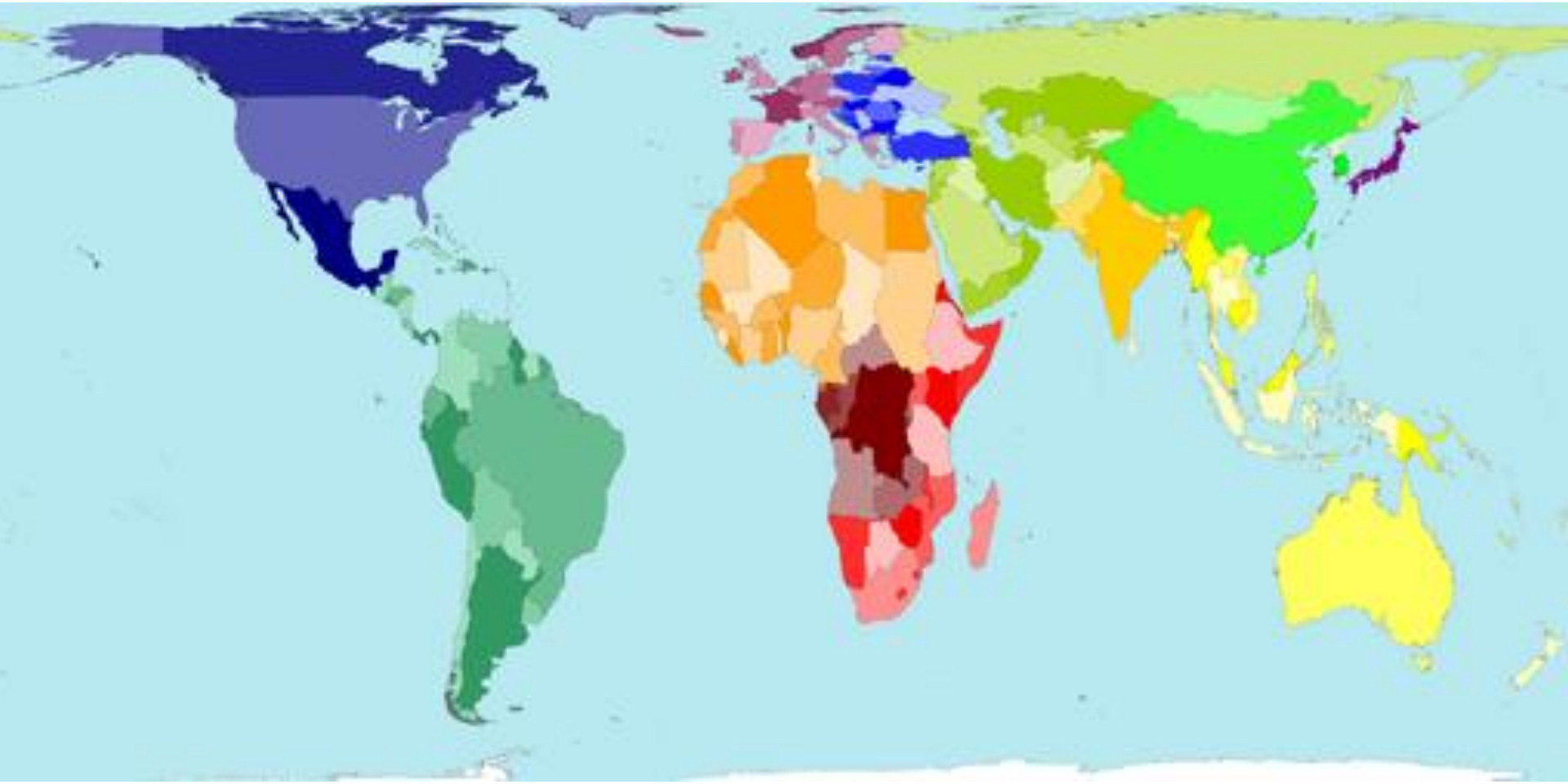
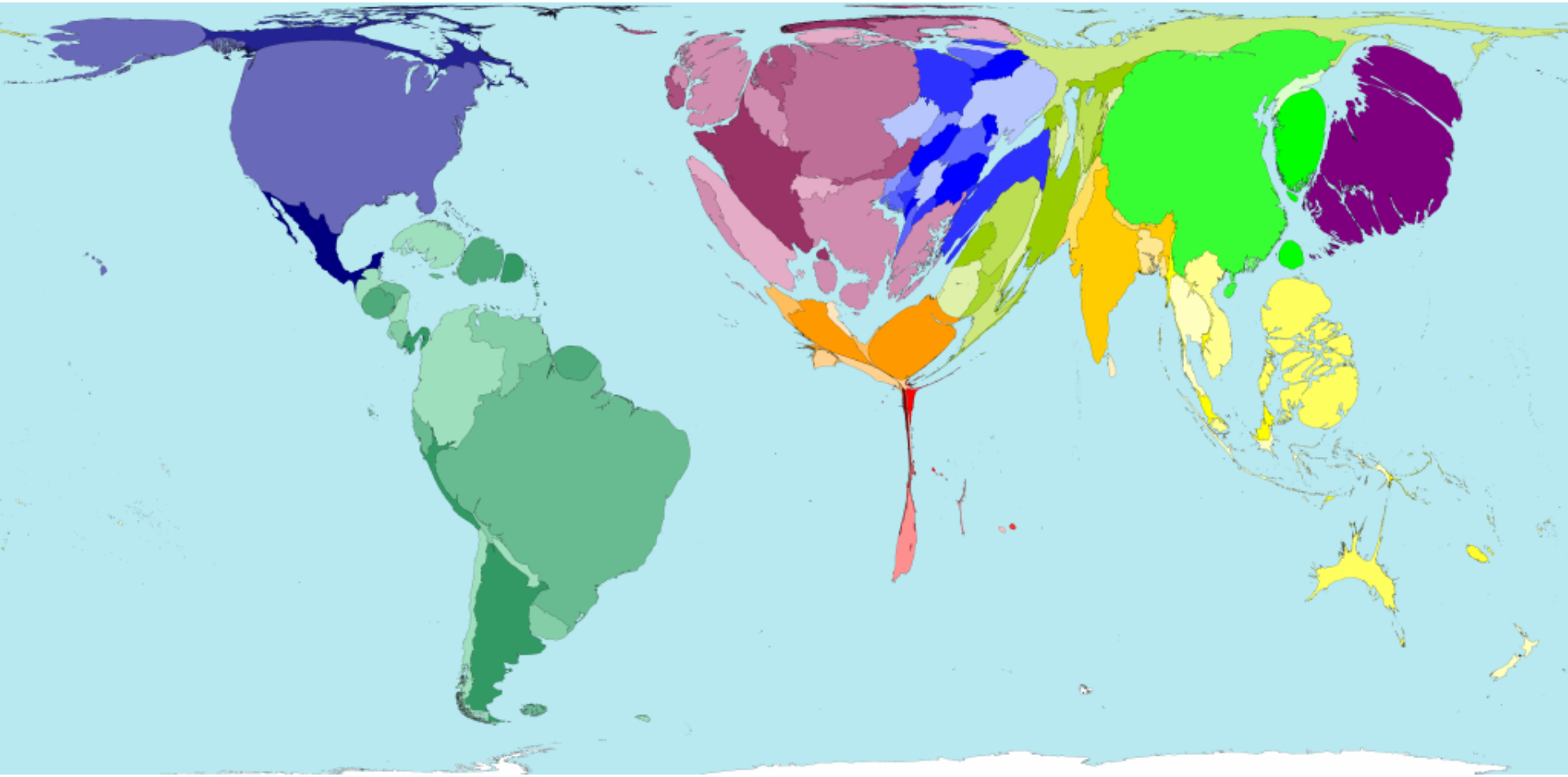
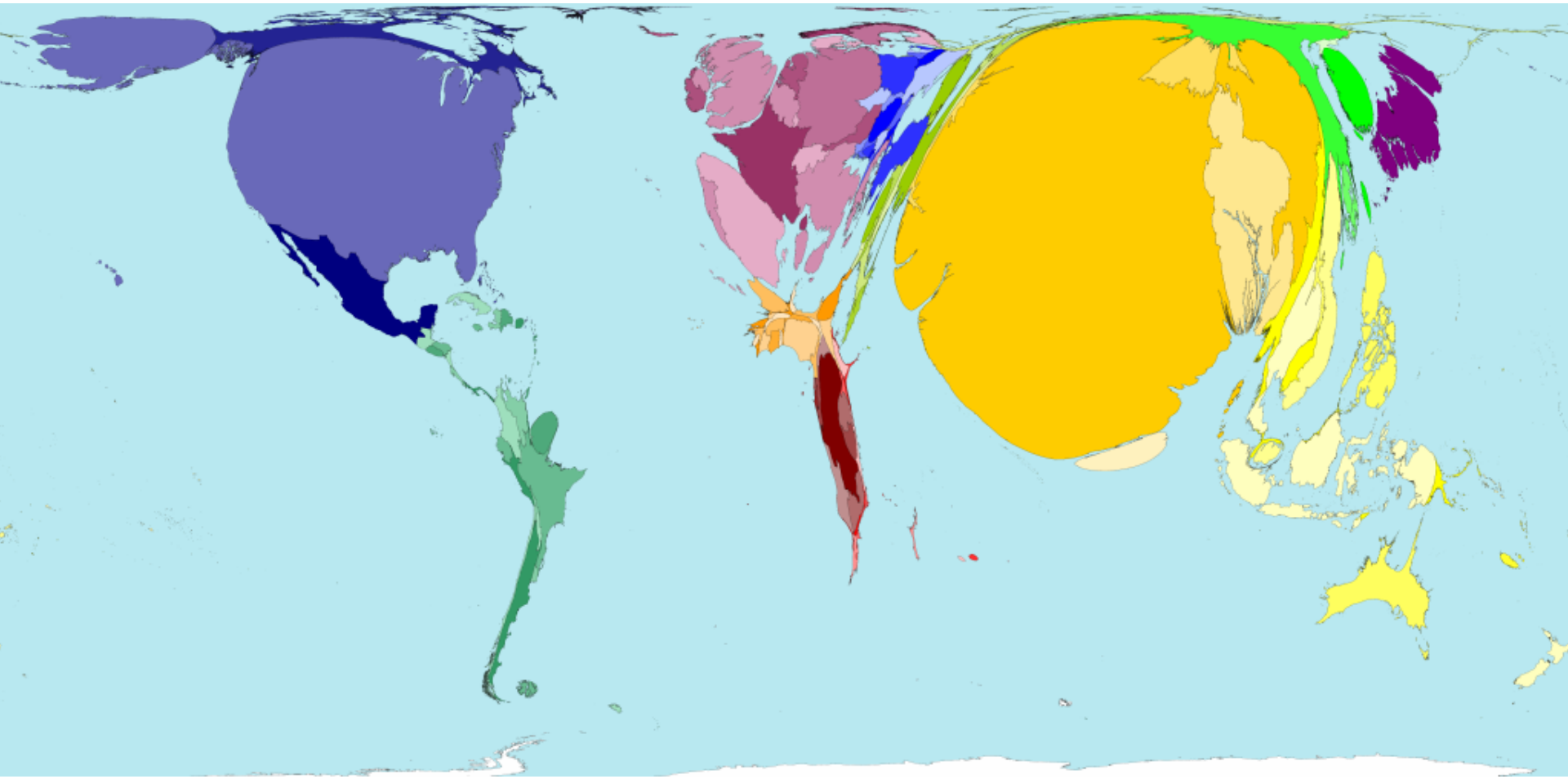
Land mass



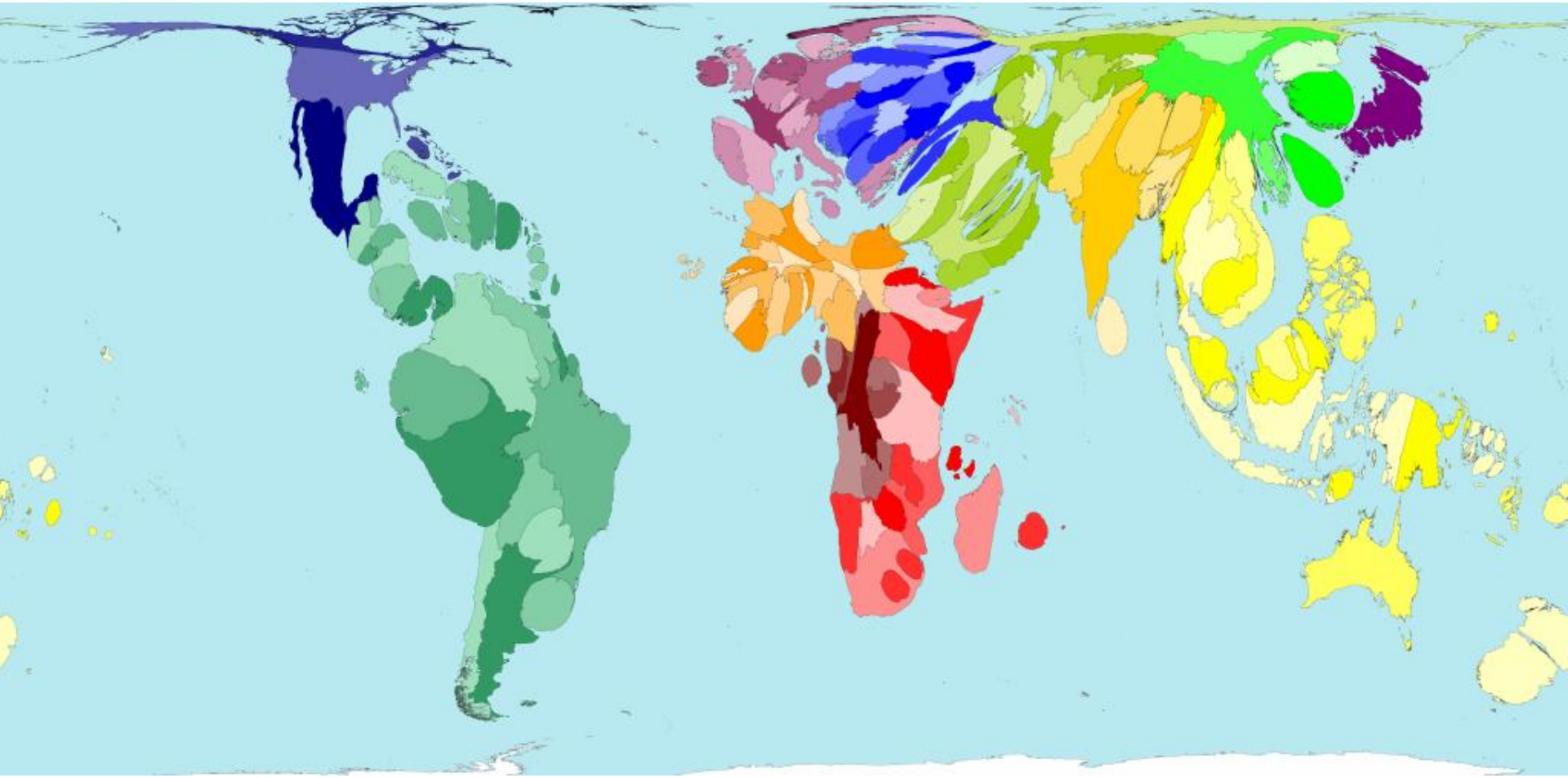
Number of dentists working



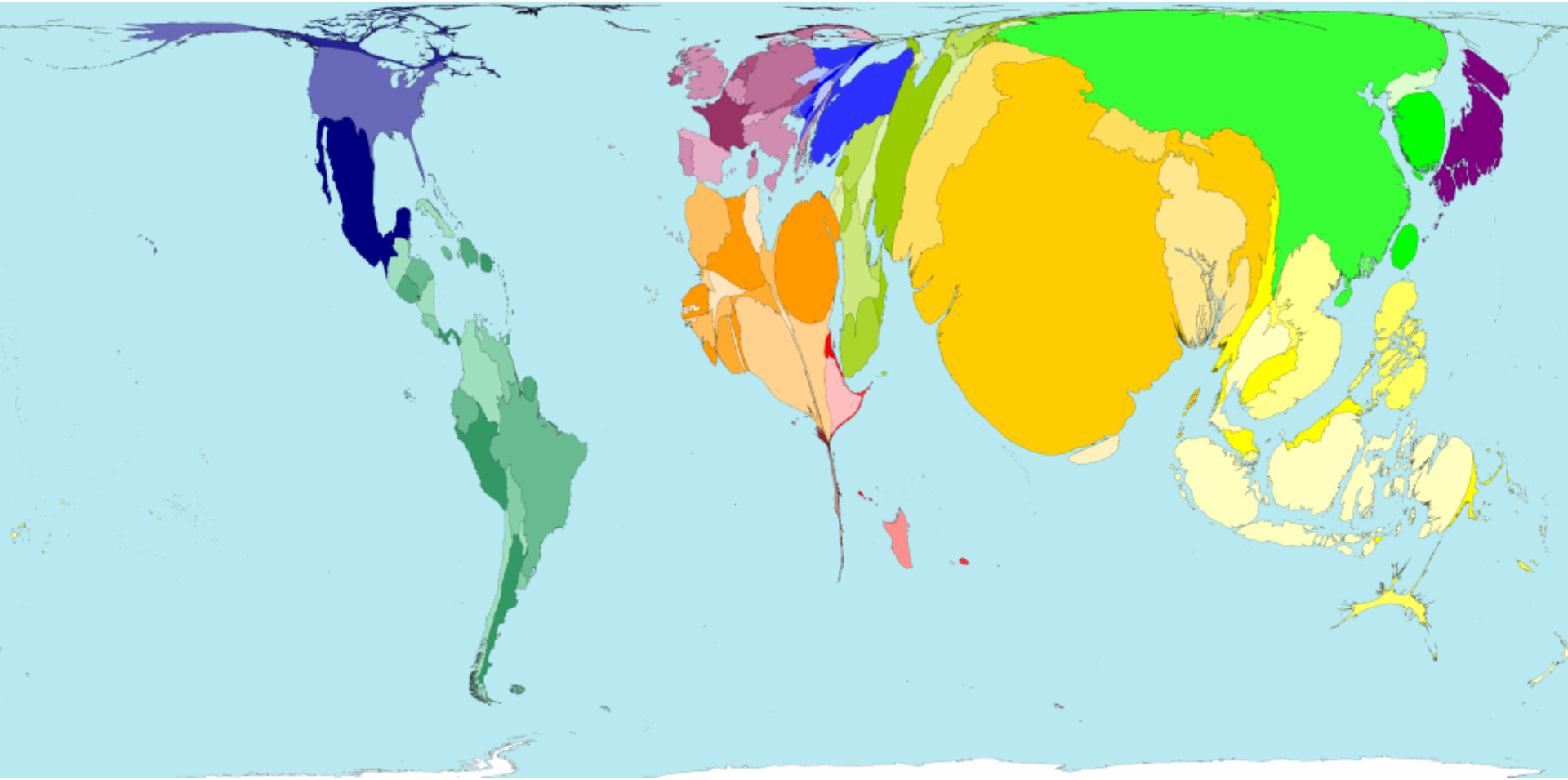
Films watched



Birds at risk



Increased life expectancy



We are in a very different place to our developed world colleagues

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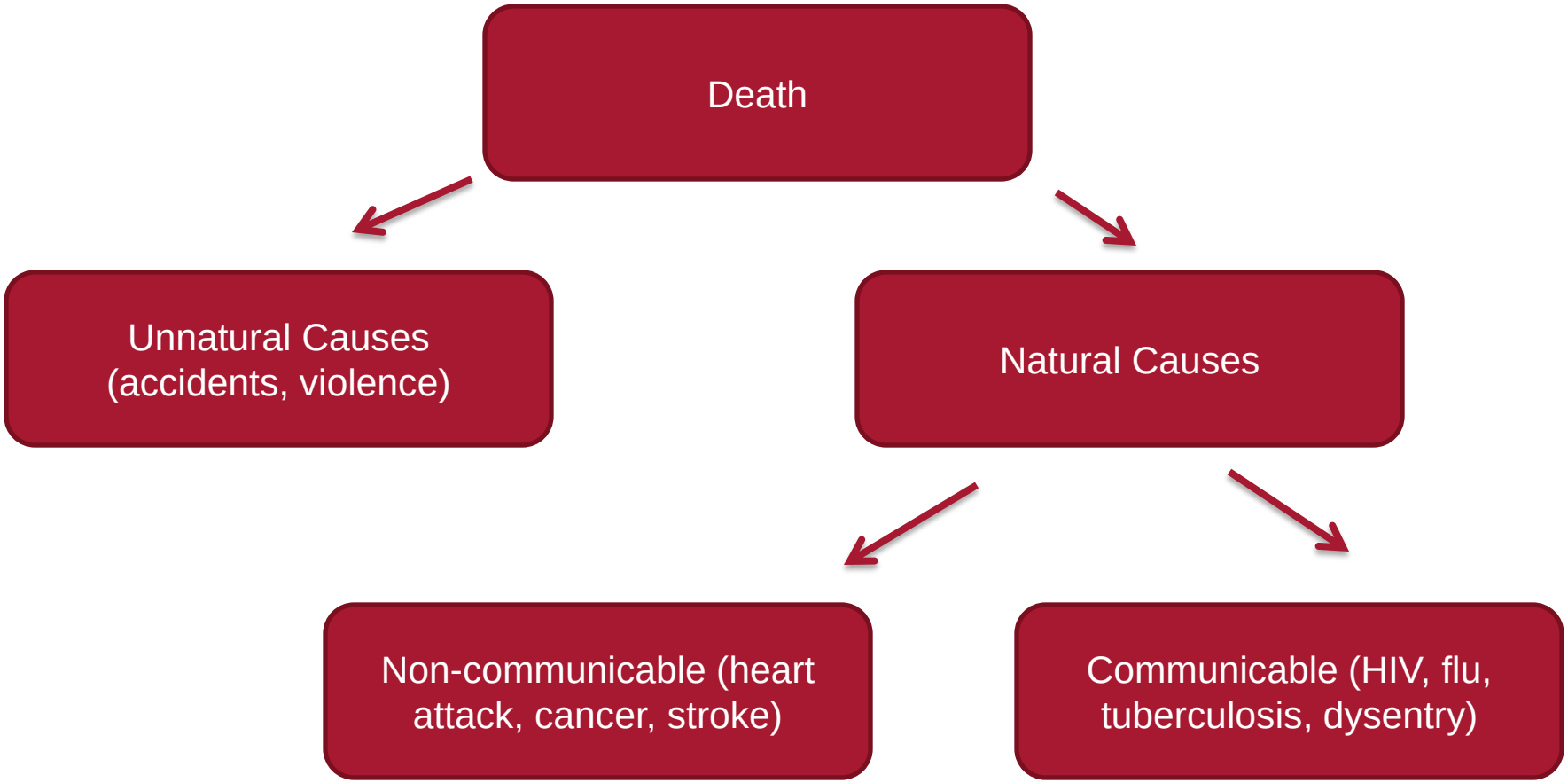
- If you have proper mortality tables then it doesn't really matter how people die, if all you are looking at is the next year
- For life insurance, mortality improvements are "fine" as they are a hidden margin
- For annuity and pension business, it is a very different story
- Going back to first principles, why do people die?

Life Expectancy

Key	UK	US	SA	Brazil	India
Life expectancy at birth (years)	80	79	54	73	65
Life expectancy at age 60 (years)	23	23	17	21	16

Why do people die



All Cause Mortality

Country	Communicable	Non-communicable	Accidental	All Causes
United Kingdom	36	401	25	462
United States	34	418	53	505
South Africa	983	635	72	1,691
Brazil	97	534	76	707
India	363	685	99	1,147

- Deaths per 100,000 population
- WHO statistics

Non-communicable Mortality

Country	Cancer	Cardiovascular	Respiratory
United Kingdom	137	142	34
United States	124	156	34
South Africa	155	262	62
Brazil	115	237	44
India	75	317	154

Non-natural Cause Mortality

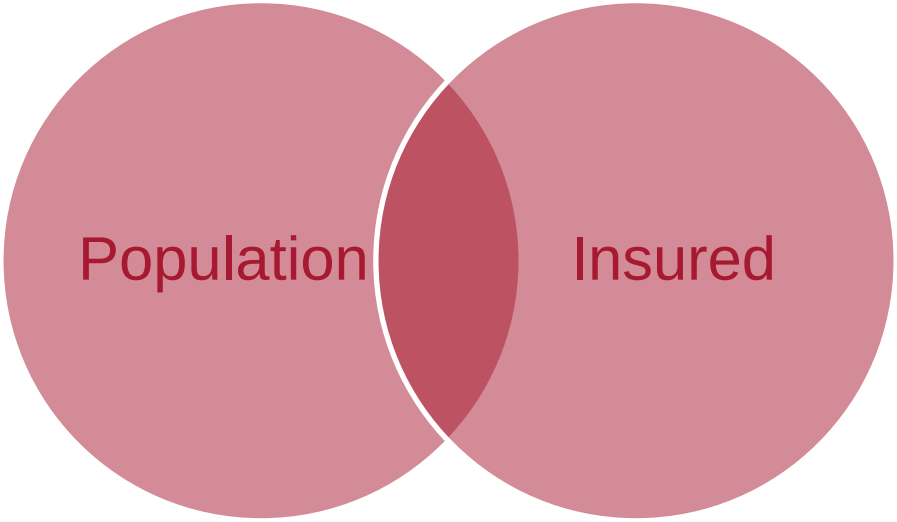
Country	Road Traffic Accident	Violence	Other	All Accidents
United Kingdom	5	1	20	25
United States	14	6	32	53
South Africa	20	29	23	72
Brazil	22	28	25	76
India	19	5	76	99

South Africa

South Africa

- Us and the world
  - What has been done?
  - Can’t the CSI just look at the data?
  - Are mortality improvements important?
  - Where to start -> Can we start?
- The more we considered South Africa
  - What do we want to measure?

South African Lives



Diversity is great but……

South African Lives

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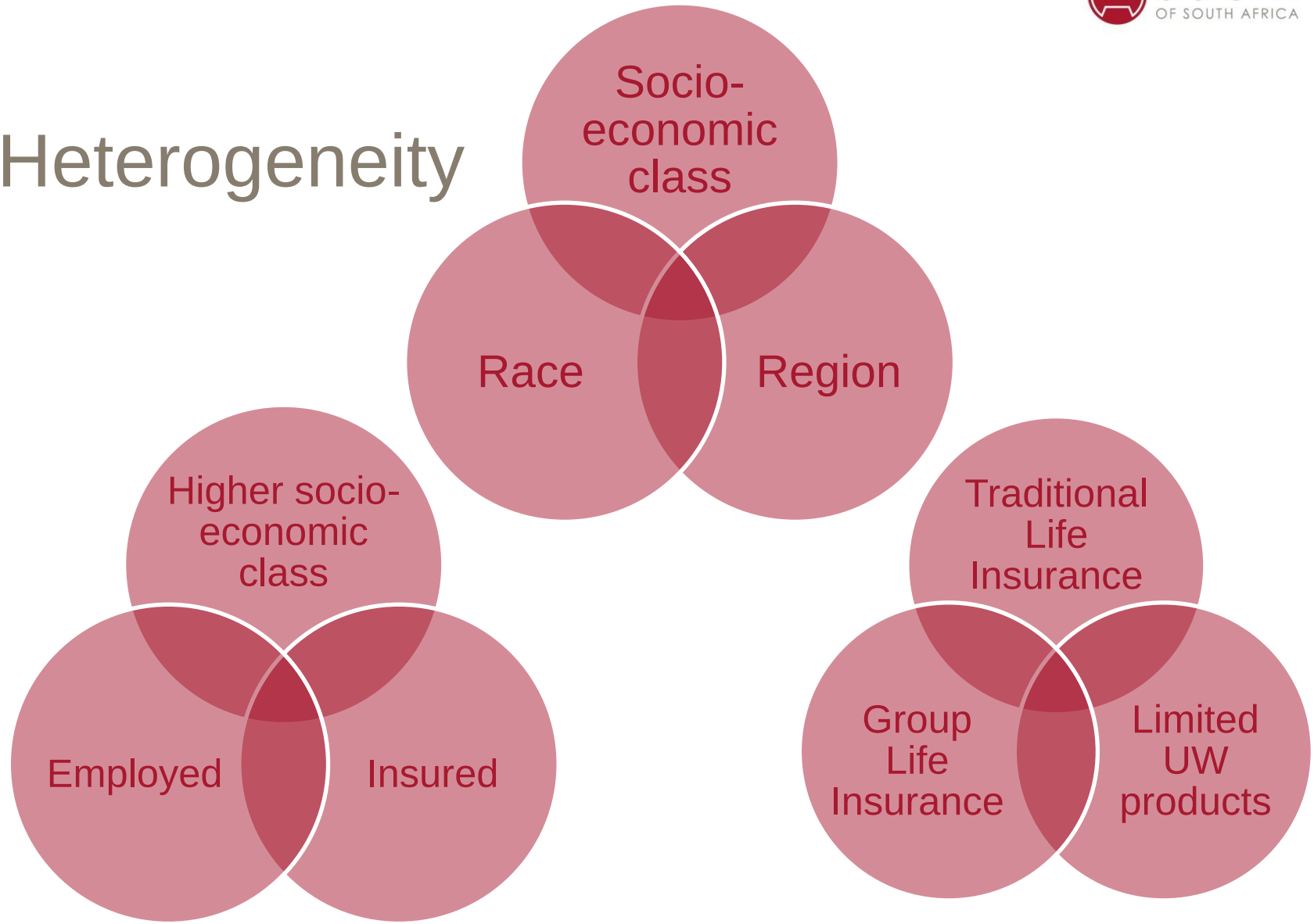
Heterogeneity



South African Lives

- Different drivers of mortality within each group drive mortality improvements
- At population level - external forces
  - AIDS & ARV
  - Social upliftment
  - Primary Health Care
  - Income & Education -> middle class
- Traditional insurance market
  - Medical advances
  - Similar drivers to UK and US?

Data

South African Data

- The biggest obstacle?

- Population Tables
  - SALT since 1921 - last tables 1984 -1986 (by race)
  - Statistics South Africa post 1986 (combined)
  - Table for the period 1996 to 2001 (Dorrington, *et al* 2004)

- Insurance Tables

South African Data

- Insurance investigations
  - Assured Lives Mortality
    - CSI Investigations : 1999 – 2002, 1995 – 1998 & 1991 – 1994
  - Annuitant Mortality
    - CSI Annuitant Report 2001-2004
    - Annuitant Mortality Investigation, 1995 – 1999
- Standard Tables
    - SA85-90 Mortality Tables (Dorrington, RE,& Rosenberg, SB 1996)
    - SA56-62 Mortality Tables (Report: Mortality Standing Committee 1974)
    - South African Annuitant Standard Mortality Tables 1996–2000

Mortality Improvement Research

- South African Annuitant Standard Mortality Tables 1996–2000
- Mortality improvements observed but disregarded :
  - The implied improvements of 3% for men and 6% for woman were much higher than those observed in the UK.
  - The period over which the trends were looked at was too short
  - The improvements seen were not consistent with other mortality studies conducted
  - The pattern of the improvements did not match that observed in the UK either.

South African Mortality Improvements

SA Mortality Improvements

- Crude calculations based on
  - SALT since 1921 - last tables 1984 -1986 (by race)
  - Table for the period 1996 to 2001 (Dorrington, *et al* 2004)
- Used data based on race and looked at white population group only
  - Longest recorded history
  - Minimise some of the AIDS impact
  - Potentially closest fit to assured lives
  - Results more comparable to other countries where improvement data is available

SA Mortality Improvements

- Looked at three scenarios in terms of duration

	Period	Years	Number of tables used
Long Term	1948 – 1998	50	7
Medium Term	1975 – 1998	23	4
Short Term	1982 – 1998	16	2

Crude Improvement Factors SA tables

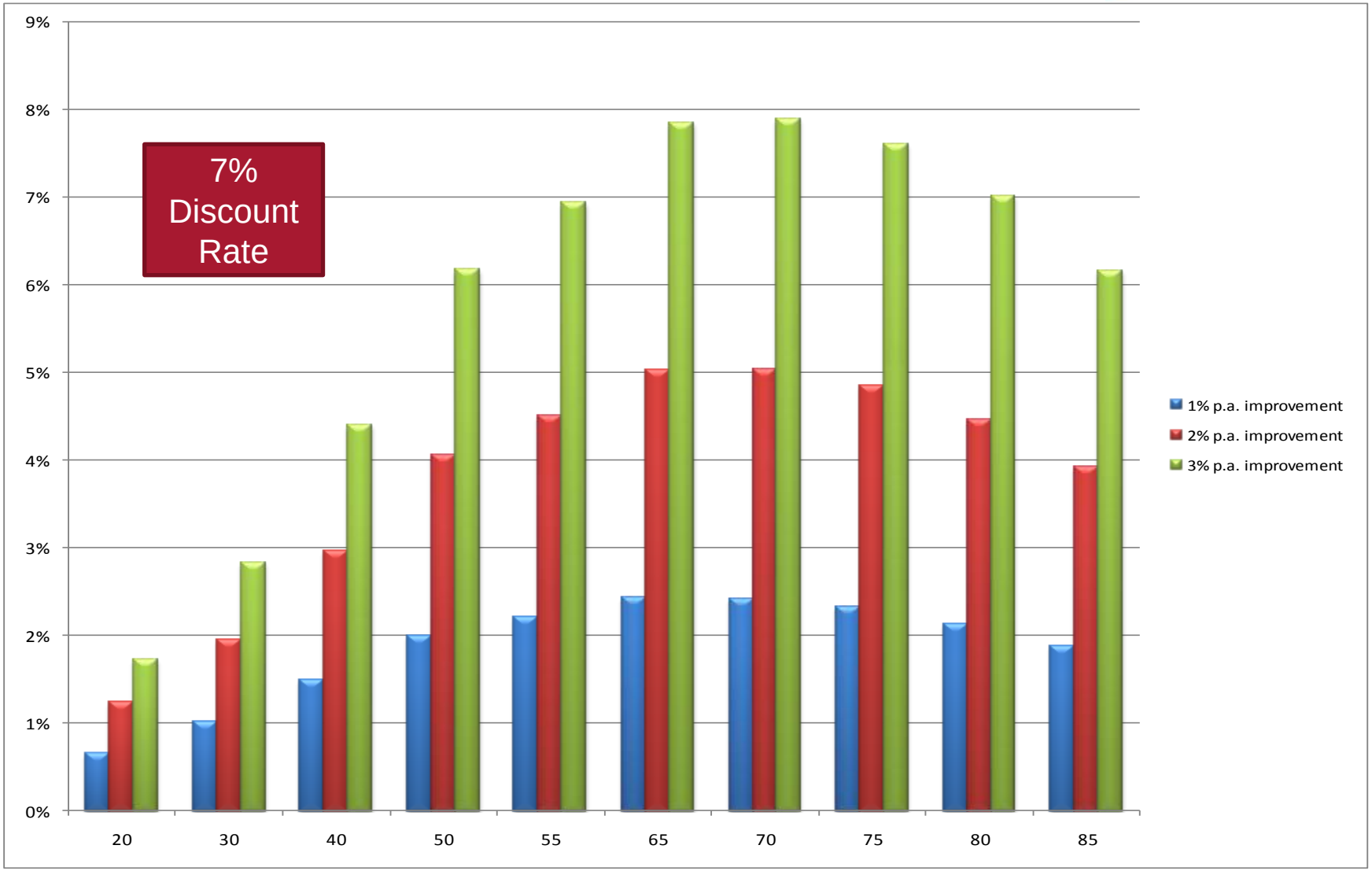
Crude Improvement Factors SA tables

Impact of Mortality Improvements

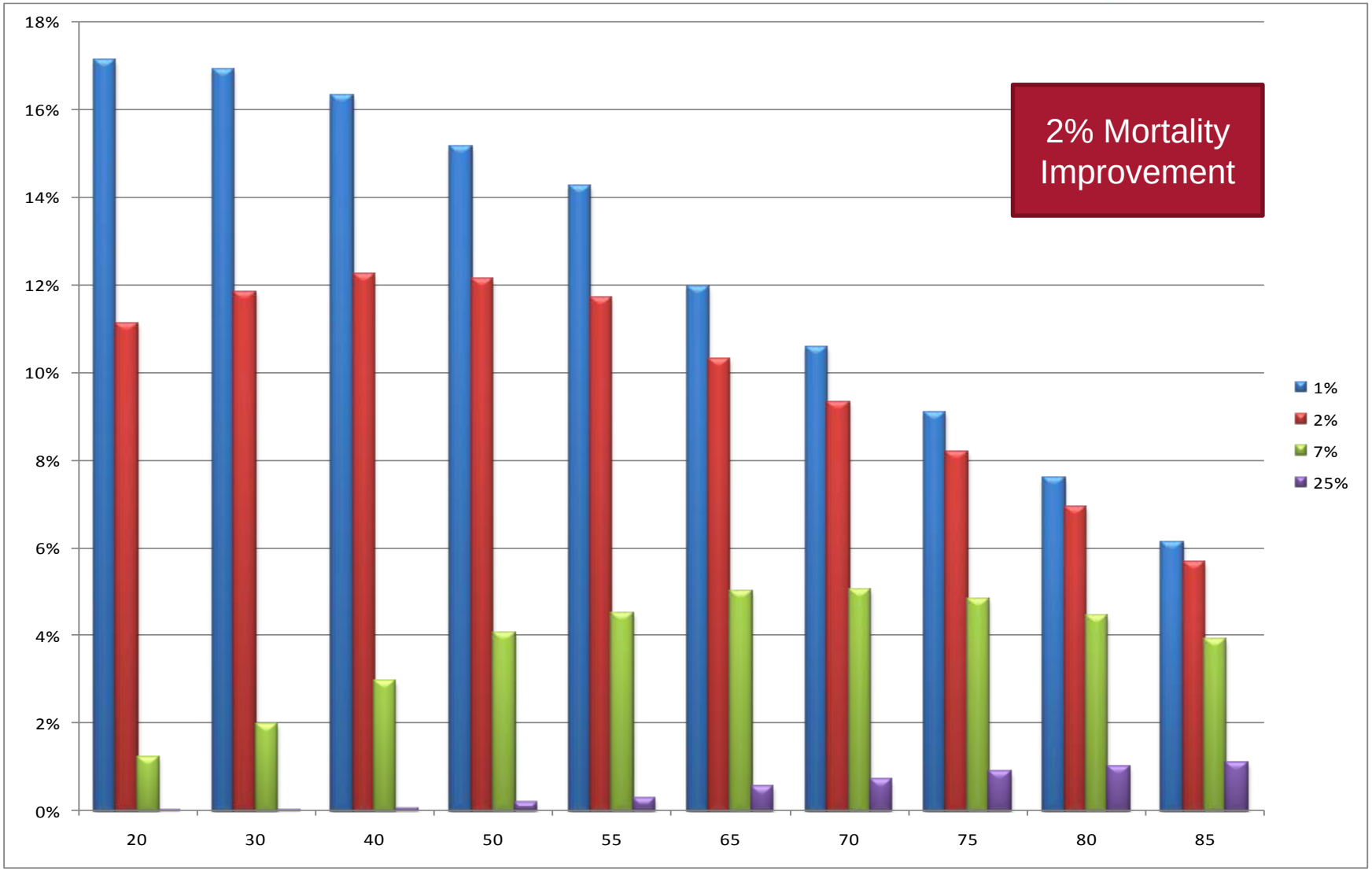
Impact of Mortality Improvements

- What does a 1% mortality improvement mean to me?
- Annuities and Insurance Products
- Impact on Present Value or Annual Level Premium
- Impact of interest rates

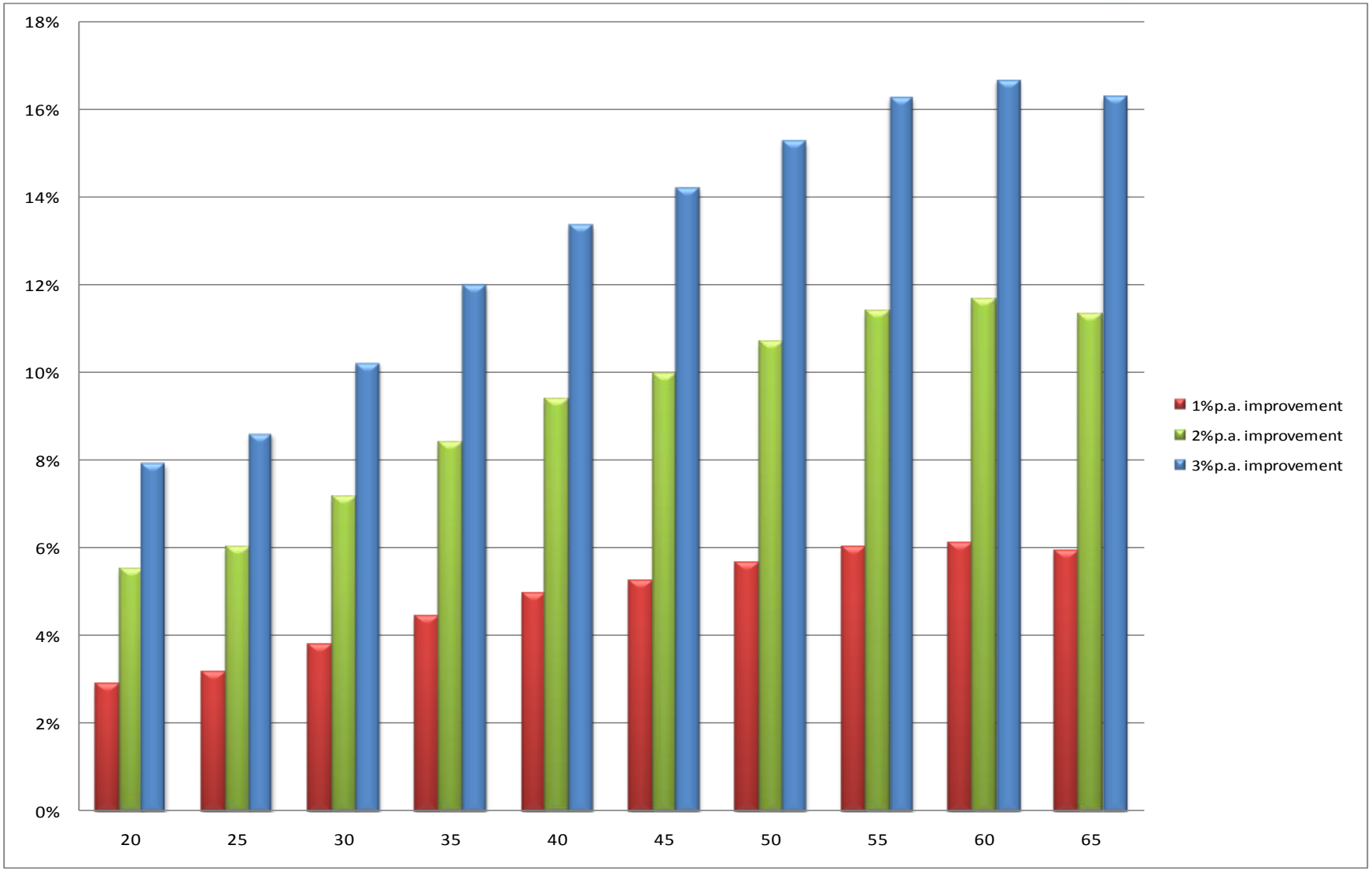
Increase in Present Value of Annuity



Increase in Present Value of Annuity



Reduction in Level Premium for WOL



Industry Views

South African Actuaries

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- Surveyed members of Life Assurance and Retirement Matters Committees
- 32 surveyed from Life Insurers and Consulting Actuaries
- Looking to ascertain
  - General views of mortality improvements
  - Views of research available
  - Assumptions being used in market
  - Importance of the topic

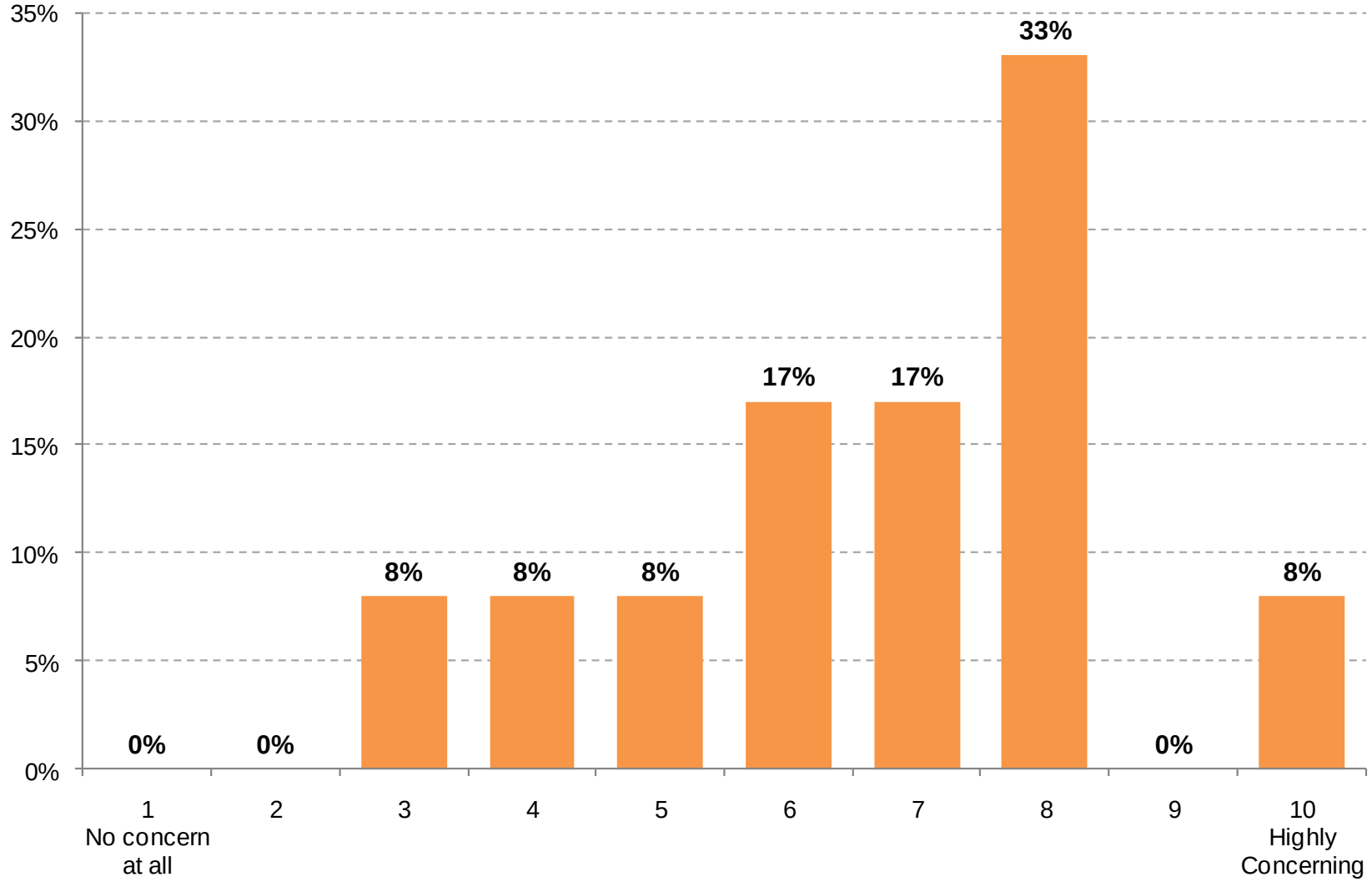
South African Industry Survey

- Work completed by the CSI is outdated and / or inconclusive
- Not enough reliable data in the SA industry to enable a credible mortality improvement analysis
- A lack of appreciation for the extent of longevity risk - other risks (e.g. HIV AIDS) have taken priority
- The resources in the industry are committed towards the most pressing short-term issues
  - Solvency Assessment and Management
  - Treating Customers Fairly

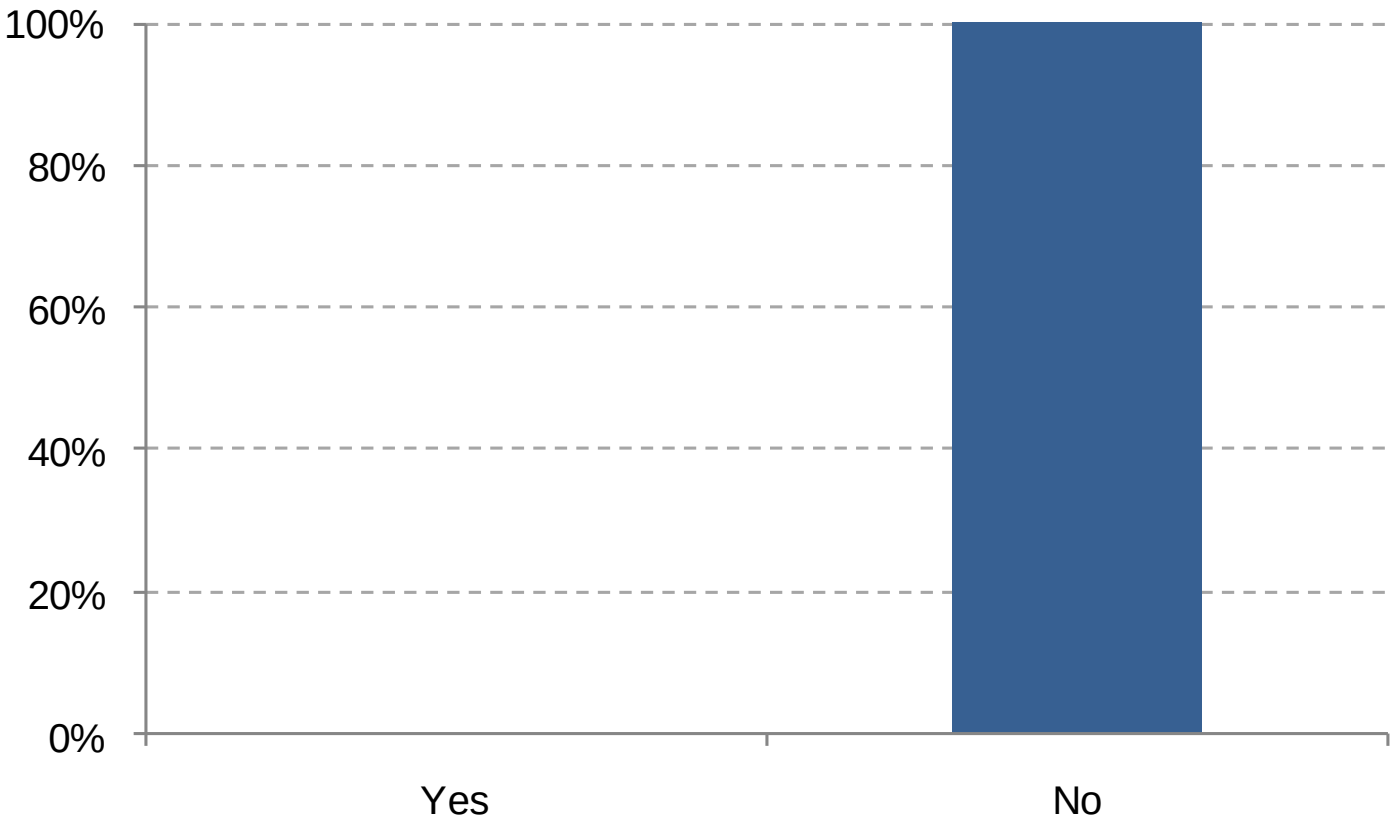
South African Industry Survey

- There is an overreliance on the research emanating from the United Kingdom
  - results from the UK are adjusted for use in SA (without substantive evidence for the adjustments) or;
  - they aren't adjusted and there is concern that these are then overly conservative.
  - There is some concern that this could have negative implications under the new "Treating Customers Fairly" framework.
  - Pension fund trustees have taken actuaries to task for assumptions set by reference to overseas longevity

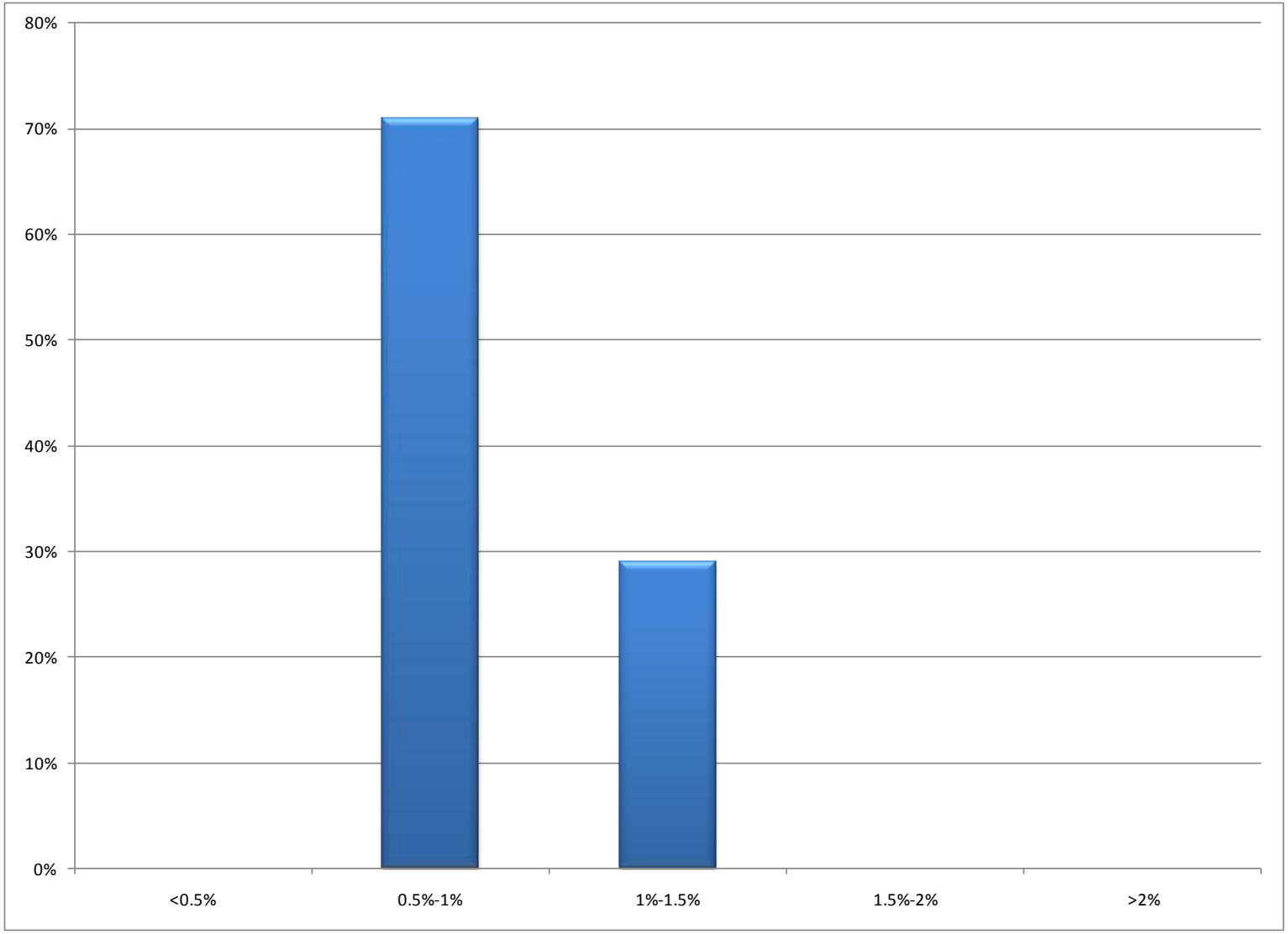
Are Mortality Improvements a Concern?



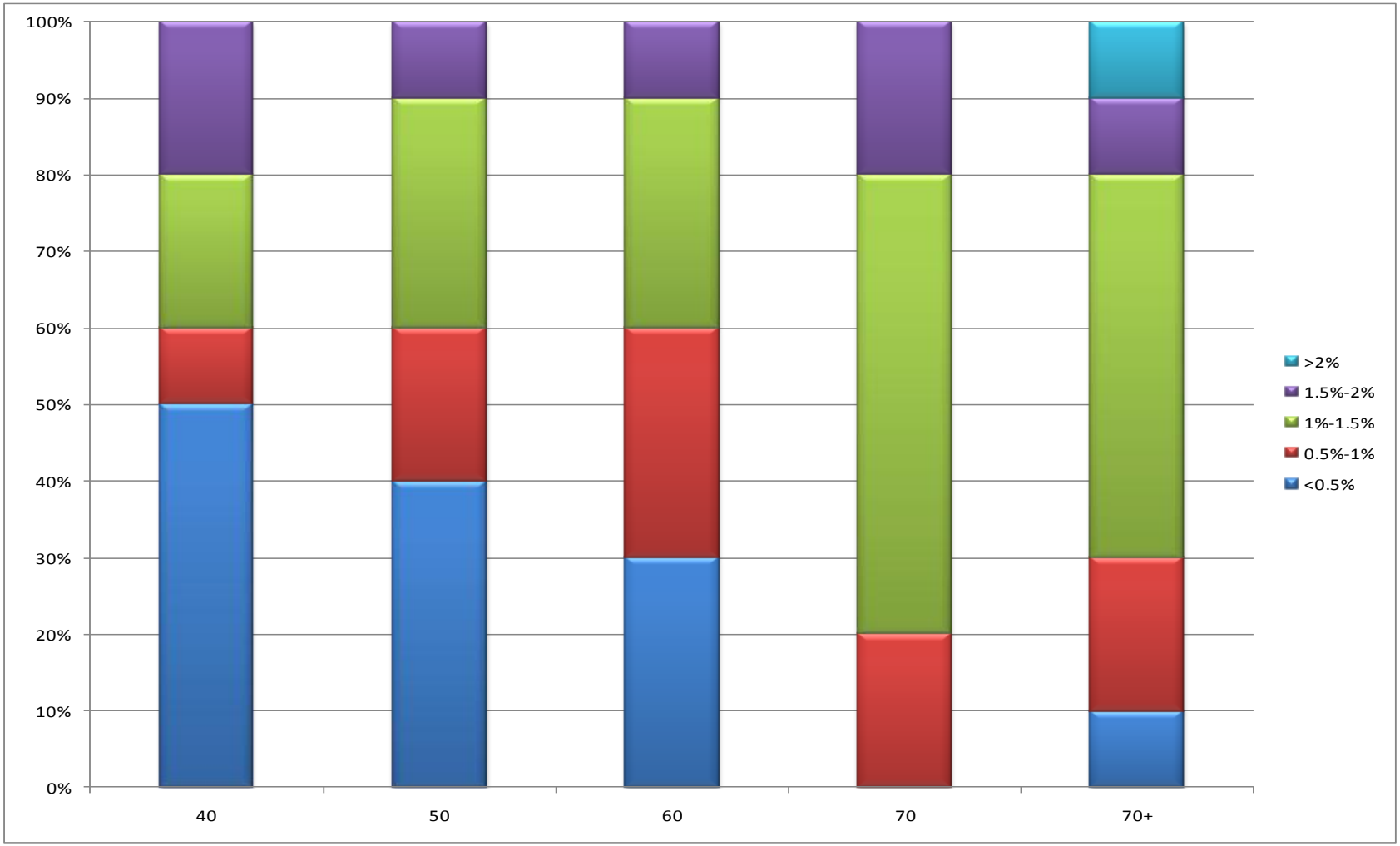
Enough SA Specific Research?



Average Long-term mortality improvement experienced?



Mortality Improvement Assumptions



Conclusion

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- An issue that seems to be very important
  - Based on views of those surveyed
  - Potential financial / economic impact
- Moving to action
  - Response to HIV and AIDS
- Solution
  - Longevity Committee?
  - Ensuring your data can be used for this purpose?
  - More involvement at national level?
  - Dedicate resources?