



The Actuarial Profession

making financial sense of the future

Coping with uncertainty and disagreement when projections are used for decision making

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Uncertainty in decision making

- The only certainties in life are death and taxes
- All policy decisions are made against a backdrop of uncertainty:
 - Is there an evidence base for the decision?
 - How reliable is the evidence?
 - Does the evidence give an adequate pointer over the period covered by the decision?
 - How much controversy/disagreement is there about the available evidence
 - Can a decision be taken without reference to the evidence base?

Examples of the use of projections in decision making

- Making spending decisions nationally
- Allocating national budgets to local areas
- Pension reform

2007 Comprehensive Spending Review (CSR)

The main long-term challenges facing the UK :

- demographic and socio-economic change, with rapid increases in the old age dependency ratio
- increasing pressures on natural resources and the global climate
- the intensification of cross-border economic competition
- the rapid pace of innovation and technological diffusion
- continued global uncertainty arising from global market instability
- ongoing threats from international terrorism and conflict
- the continued imperative to tackle global poverty.

Long-term public finance report

- In 2002 the Government launched the Long-term public finance report
- It provides comprehensive analysis of long-term demographic developments, and their likely impact on the public finances.

Long-term public finance report 2008

- As with previous Long-term public finance reports, the focus of the 2008 Report was on demographic change and how this might affect the sustainability of the public finances over the long term.
- Because population projections are subject to substantial uncertainty and are highly sensitive to the underlying assumptions, variant population projections were used to provide an illustration of the potential range of uncertainty surrounding future trends
- ONS population projections are not interpreted as forecasts but instead as an indication of what would happen if the assumptions turned out to be true

Migration uncertainties identified

- Predicting future net migration flows is especially difficult as many factors are impacting on the decisions of potential future migrants
- Increased population individual mobility and population turnover mean that past trends may not be a good guide to the future.
- The extent to which assumptions have varied in the past highlights the uncertainty that exists when attempting to model future trends.

Natural change uncertainties

- Fertility - changing attitudes to family size, delayed entry into marriage or cohabitation, and increased female participation in education and the labour market
- Life expectancy – disagreement over limits to improvements, effects of lifestyle changes in the developed world, technology change

Household uncertainties identified

- Household numbers - influenced by changes in family formation, and an ageing population
- The structure of households and their behaviour - affect the role of Government in the future and the public finances in the long term.

Resource allocation

- Over £100BN per year are distributed to local areas on a population capitation basis using formulae that include projected population distributions by age.
- These age-cost weightings in these formulae are generally substantial
- Currently no variant projections are produced, although there is substantial disagreement about the accuracy of the projections

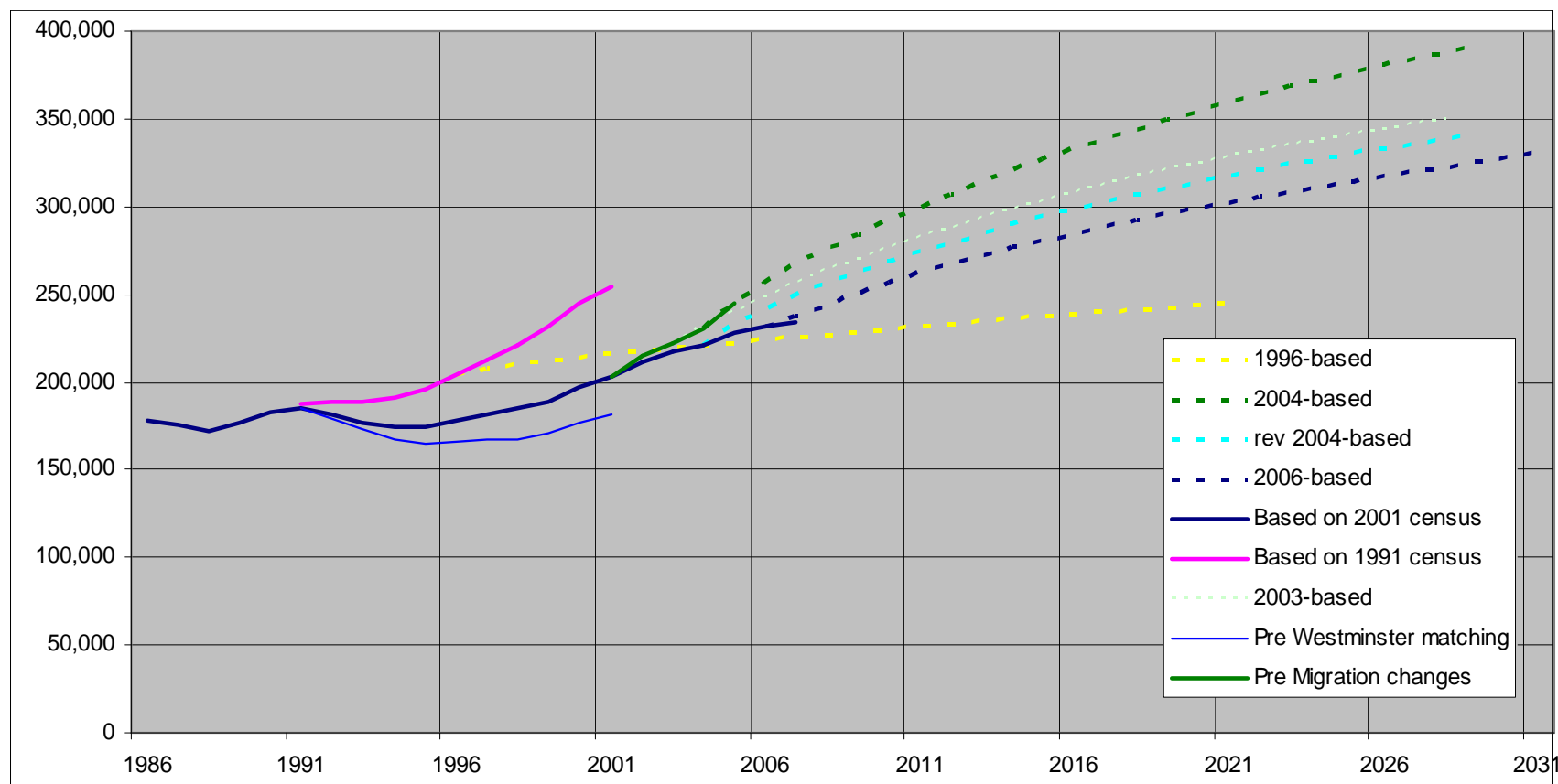
Treasury Sub-Committee's inquiry into Counting the Population

- Mid-year population estimates are not fit for purpose as they fail to properly account for internal migration.
- The current methods of estimating internal migration are unsatisfactory and lead to decisions on the allocation of funding to Local Authorities being based on inadequate information.

Sensitivity of local population figures to methods used

- Successive routine rebasing of projections and revisions to the population estimates and migration and fertility assumptions can have a substantial impact on local projections over the CSR period

Estimating and projecting the population of Westminster 1986-2031



Pensions Commission – health inequality issues

- What effect would the persistence of inequalities in life expectancy have on the equity of changing the pension age

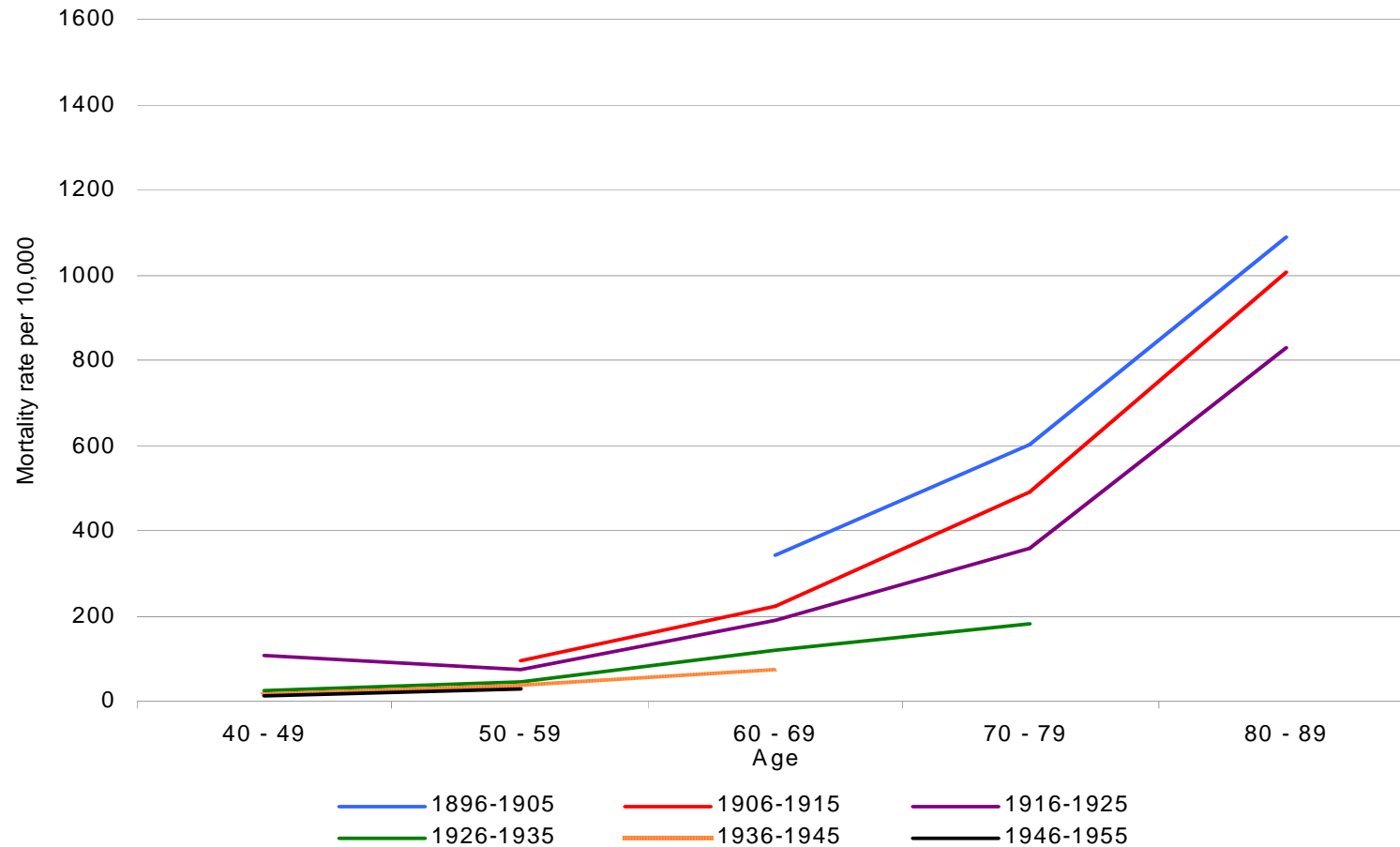
Trends in male life expectancy at age 65

Social classes I and V, 1972-2001



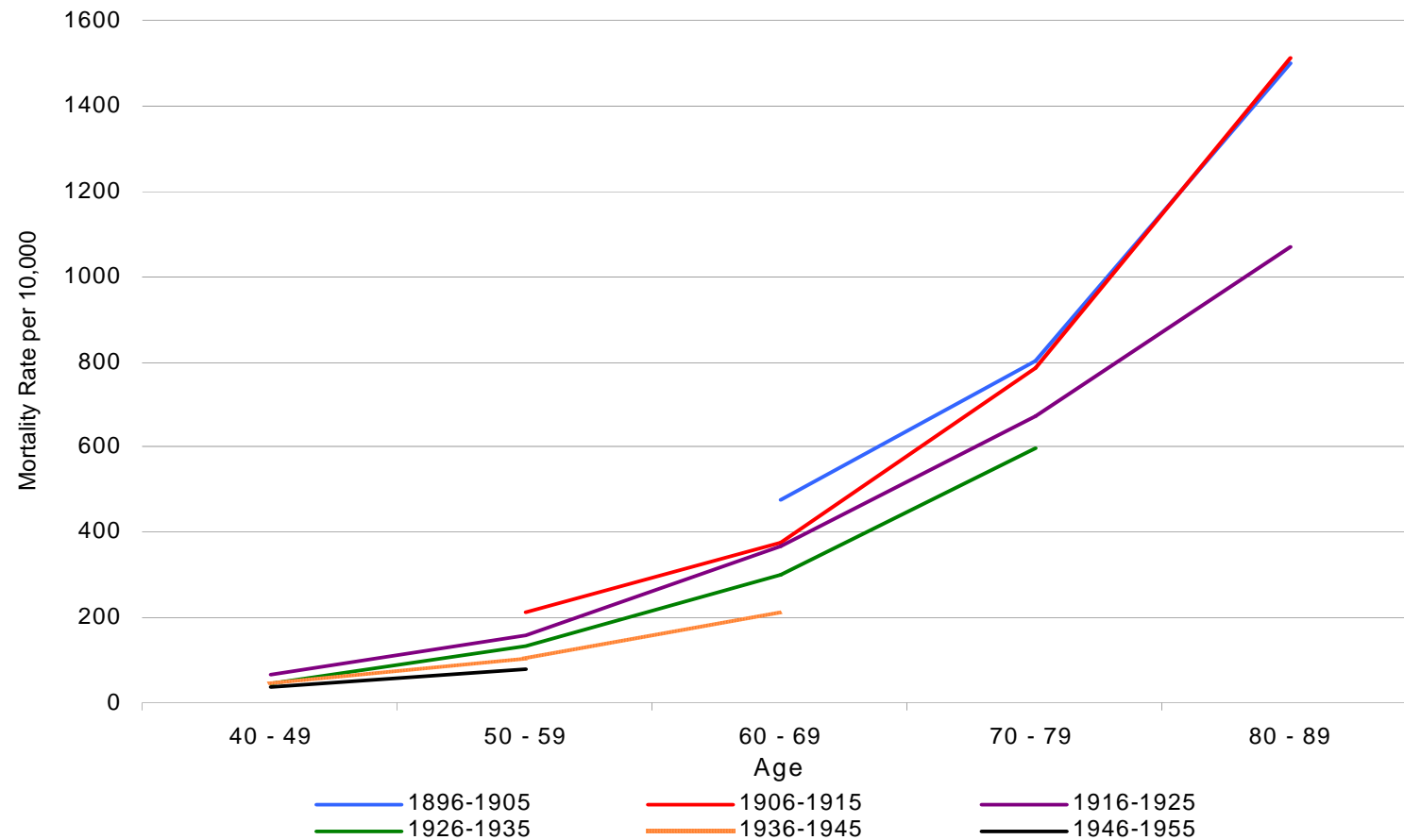
Cohort mortality

Male Cohort Mortality Rates, Cohorts born 1896-1955
Social Class I



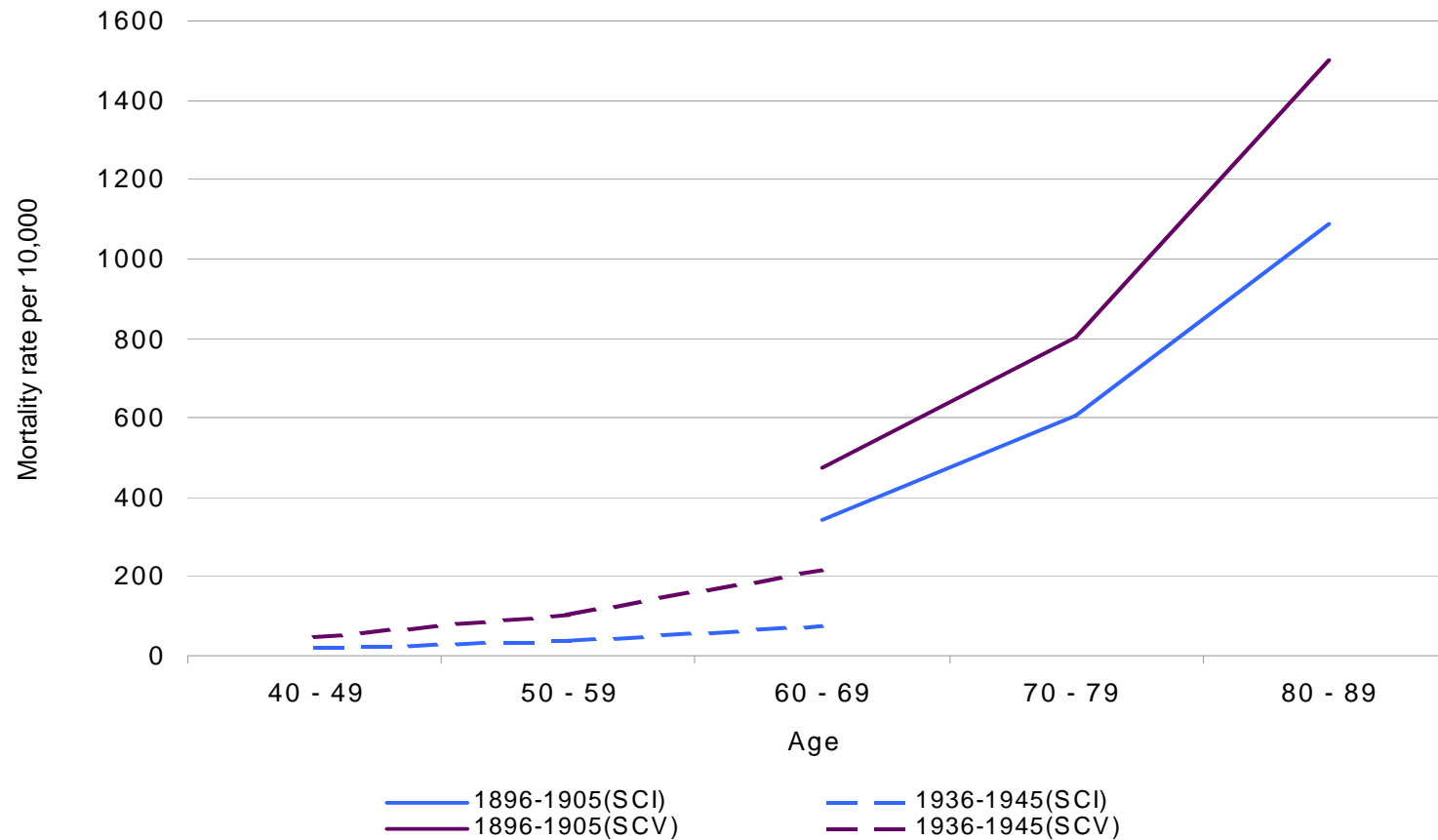
Cohort mortality

Male Cohort Mortality Rates, Cohorts born 1896-1955
Social Class V



Cohort mortality

Male mortality rates for cohorts born around 1900 and 1940
Social Classes I and V



Understanding population uncertainties and their impact

- Working with researchers and experts e.g.
 - ESRC Centre for Population Change
 - HM Treasury work with researchers to understanding the underlying trends and their likely impact on public finances
- Migration Statistics Improvement Programme

Analytic techniques for dealing with population uncertainties

- Quality measures
- Stochastic modelling
- Indicators of the impact of change
- Comparison of alternative data sources
- Comparing top-down and bottom-up approaches
- Developing indicators of the impact of change
- International comparisons