

Public Spending and the Effect of Changes in Life Expectancy

16 June 2009

*What alternative methods of
estimating life expectancy are
available?*

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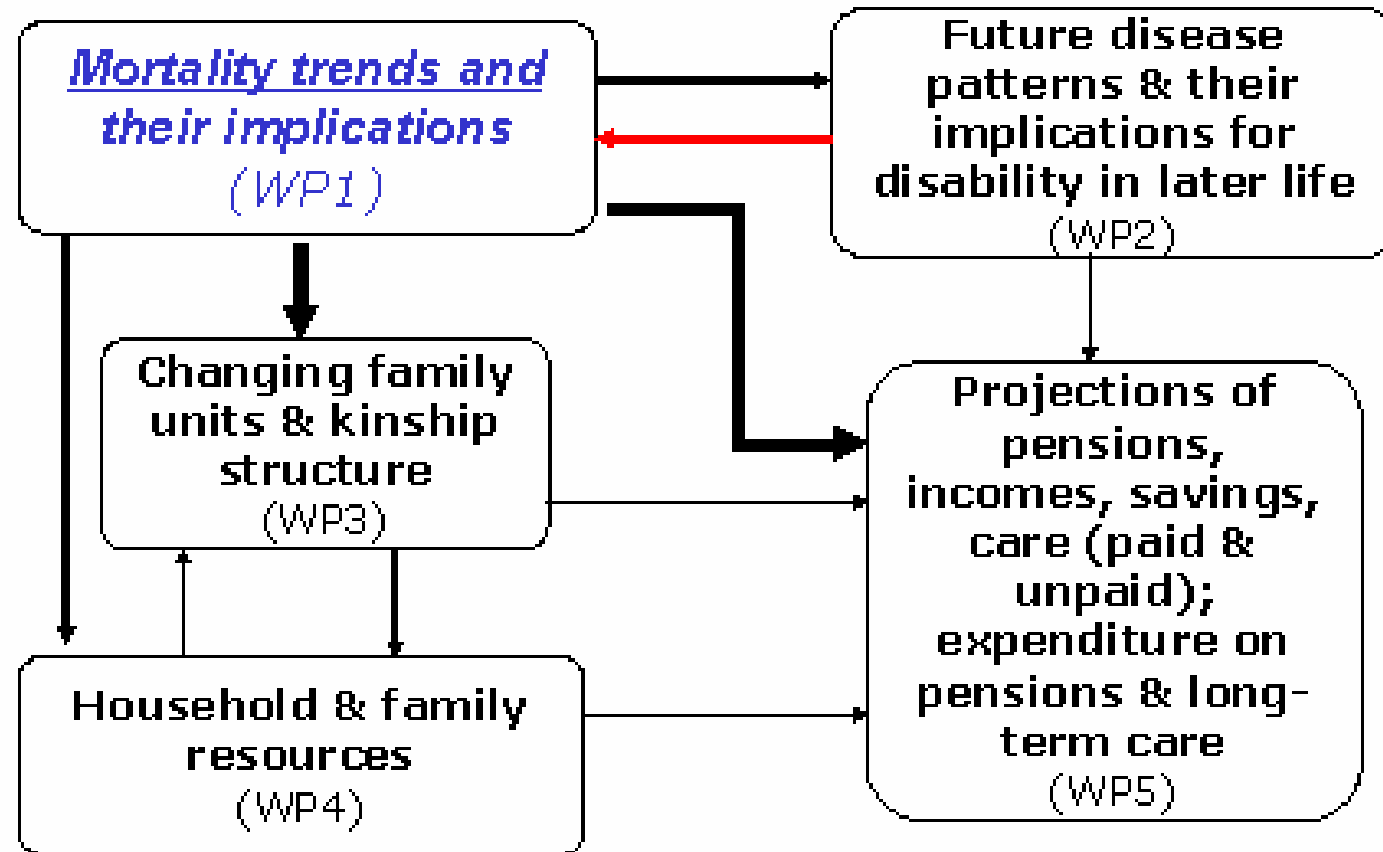
MAP2030 Programme Objectives

To produce high quality analysis to inform public debate and development of future long-term care and pensions policy up to 2030 by:

- projecting the numbers, disability status, family circumstances, income, savings and care needs of older people
- assessing the affordability and distribution of costs and benefits of combined policy options for pensions and long-term care
- accounting for links between care needs and economic resources in later life

MAP2030 Structure

Mortality trends & implications linkages



MAP2030 Research Teams

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Supporting partner

Department for Work and Pensions

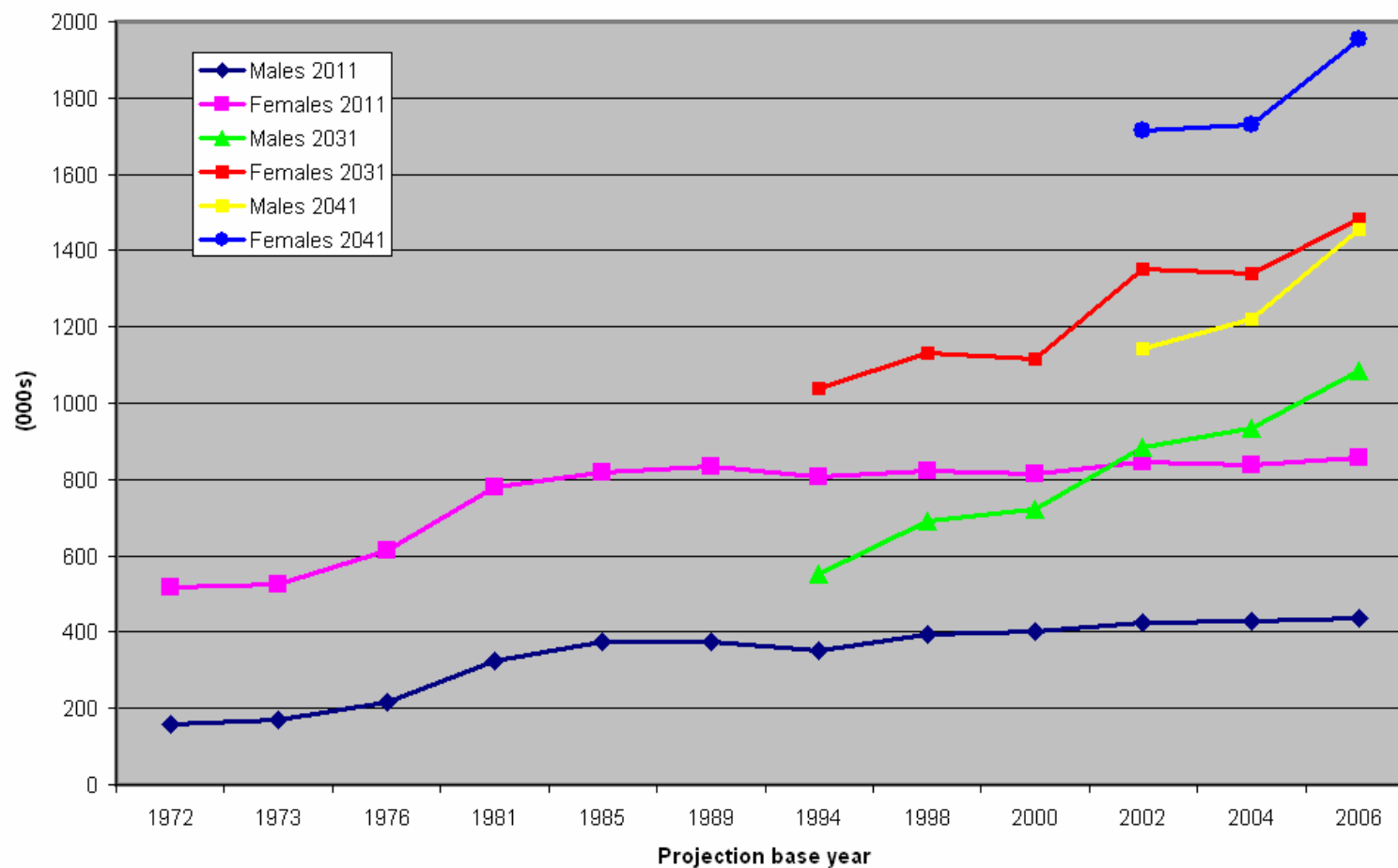
Why looking at life expectancy matters

“Dependency time-bomb: Britain must urgently take steps to prepare for the seismic impact of a rapidly ageing population”

George Magnus (senior economic adviser for UBS investment bank)

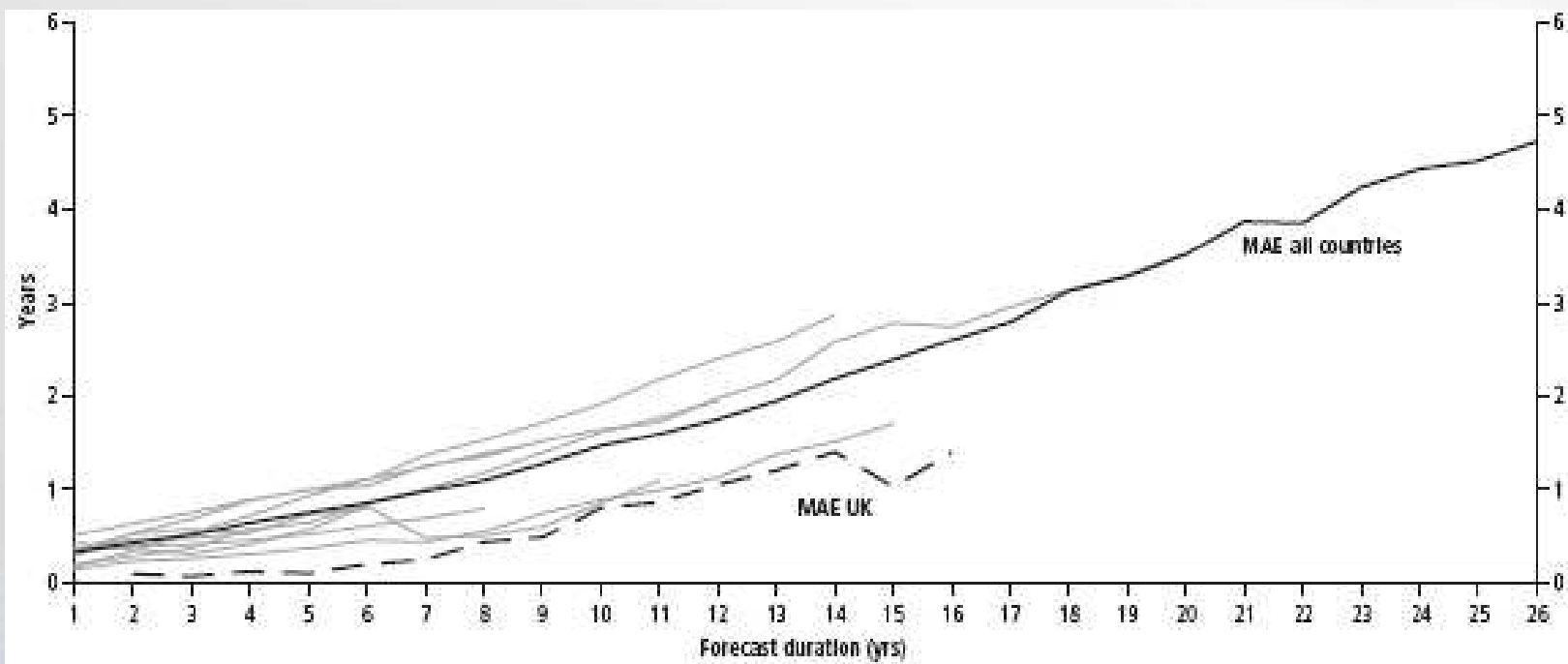
The Guardian, Wednesday 4 February 2009

Projections of population aged 85 & over in 2011, 2031 and 2041, alternative projection base years, England & Wales



Source: author's calculations

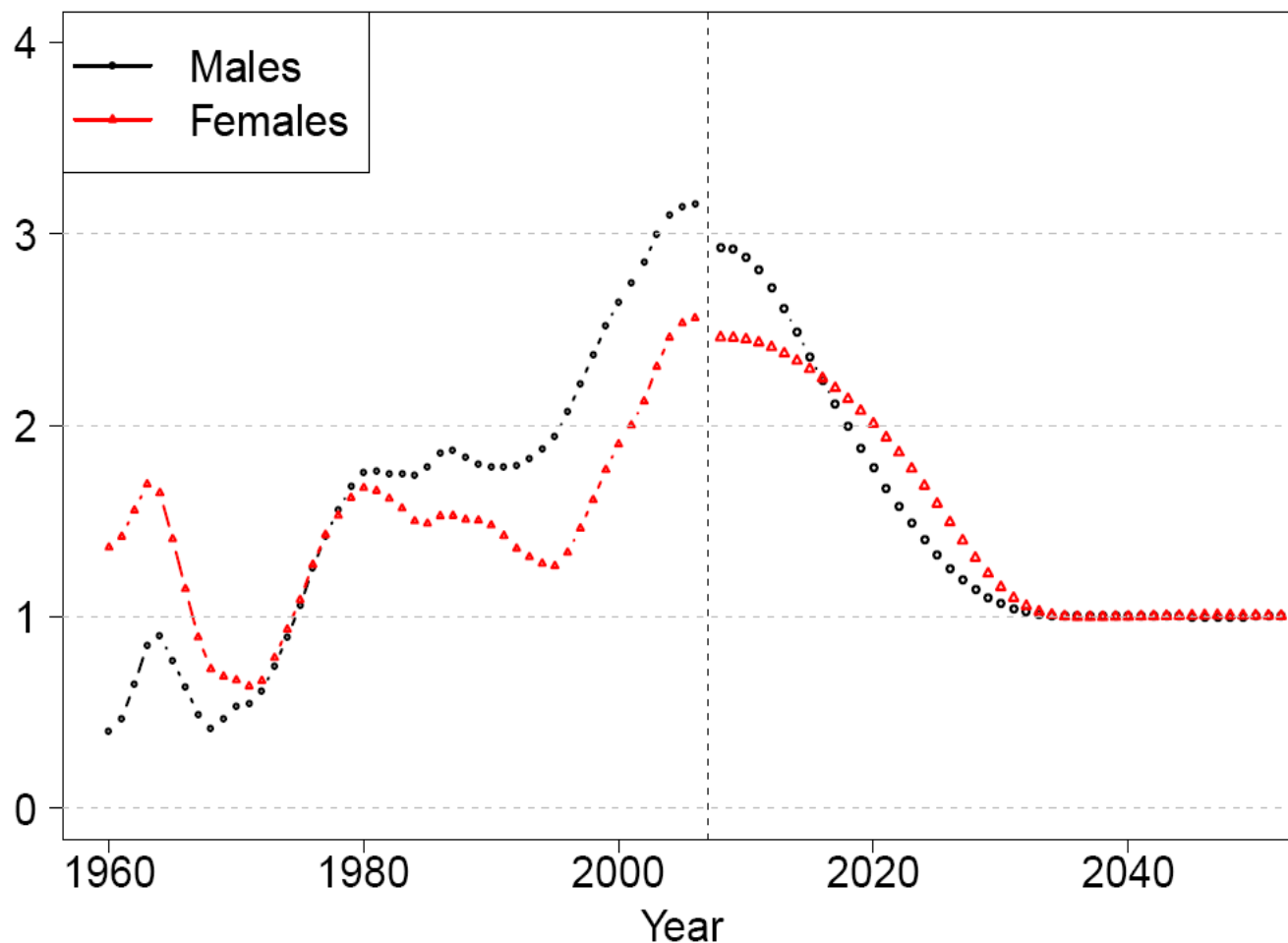
Observed mean absolute error for life expectancy at birth for men in 14 countries



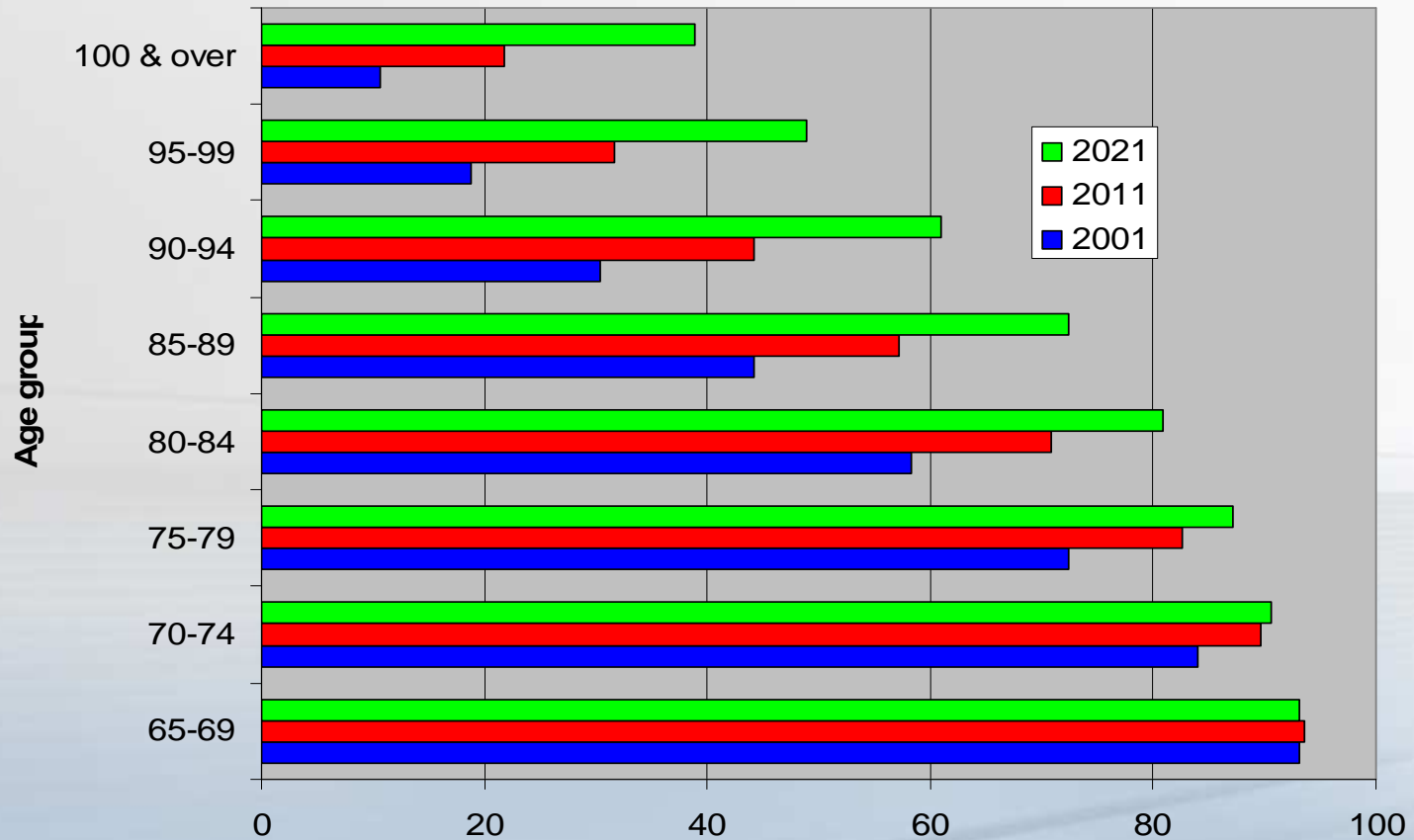
Nico Keilman. UK national population projections in perspective: How successful compared to those in other European countries? Population Trends 129, Table 3

England & Wales standardised mortality rate annual smoothed improvement (%) 1960-2050 (2006-based principal projection)

Author's calculations based on WHO European Standard



Sex Ratio (Males per 100 Females), England & Wales 2001, 2011 & 2021 (2001 Census & 2006-based projections)



The choices

“There is the possibility of lower incidences of cancer, heart disease and strokes through changes in lifestyle and medical advances

On the other hand some demographers believe that ... a law of diminishing returns will apply to death rate reductions at advanced ages”

(Office for National Statistics, 2008, National Population Projections 2006-based Series PP2 No 26, ed. Helen Bray, p. 33)

Main drivers of past mortality - and future also?

- Medical Advances
- Smoking trends
- Obesity
- Infectious diseases
- Uncertainty at young ages

(Karen Dunnell, 2008, Ageing and Mortality in the UK - National Statistician's Annual Article on the Population. Population Trends 134: 6-23, p. 19)

The “Golden generations”

“Those born during the period 1923–1940 (and centred around 1931) have exhibited greater rates of improvement over the last 25 years than those born on either side. There is currently no evidence that these differentials are declining. Similar cohort effects seen in other countries suggest that these differentials may persist well into the oldest ages.”

(1931 Cohort assumed to improve 1.5% p.a. more than underlying 1% value: PP2, 2008, p. 26)

Actual and assumed overall average annual rates of mortality improvement, England & Wales (Per cent)

Series PP2 No 26 Table 7.3

	Males		Females	
	Past (actual)	Future (assumed)	Past (actual)	Future (assumed)
Last/next 24 years	2.13	2.12	1.47	2.15
Last/next 44 years	1.54	1.62	1.33	1.64
Last/next 74 years	1.23	1.37	1.27	1.38

The role of obesity

Obesity

- *Increasing trend*
- *Potentially important in substantially reducing e_0*

But

- *Extrapolation of trends is over-simplified*
- *Magnitudes of estimated effects are inconsistent*
- *Major route of obesity -> mortality is CVD*

The first generation to live less than its parents?

The Government Actuary's Department currently predicts that life expectancy will rise in the next 50 years by around eight years for men and seven years for women the role of the increase in obesity will have surprisingly little impact (less than a year) on the life expectancy of the population

(Government Office for Science. Tackling Obesities: Future Choices. Foresight Project Report 2nd Edition p. 38)

Reasons to expect mortality improvements to decline

Negative

- *cohort effect dies out*
- *smoking cessation 'bonus' disappears*
- *early life factors less relevant*
- ...

Positive

- *obesity*
- *lack of blockbuster drugs*
- *evolution*
- ...

Reasons to expect mortality improvements to increase

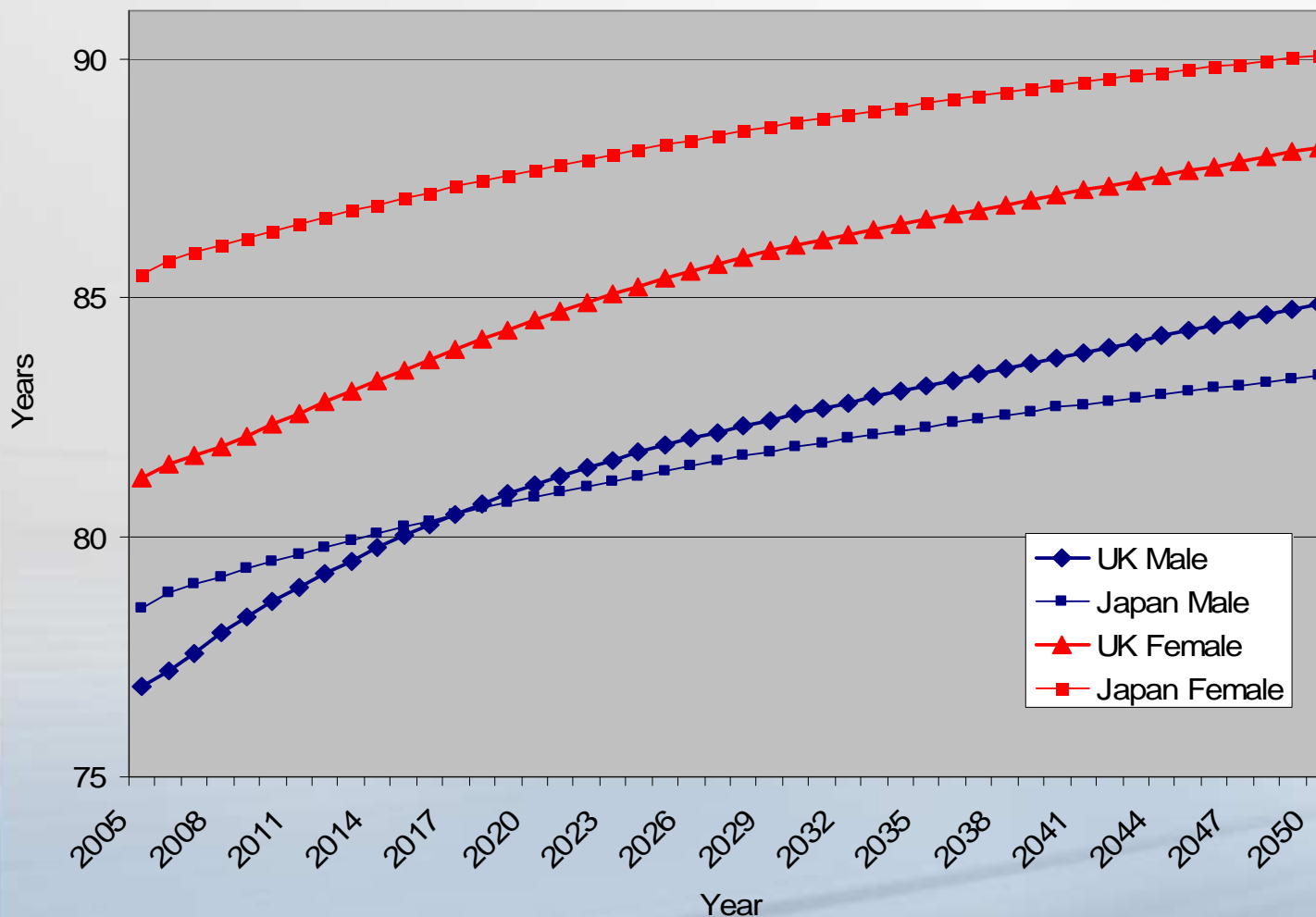
Negative

- *smoking effects among older people over-rated*
- *early life effects*
- *...*

Positive

- *improvements in prevention and treatment*
- *empirical lack of limits*
- *...*

Life Expectancy at Birth, UK & Japan 2006 Principal Projections



Life expectancy at birth, alternative variants, UK

“Users of the projections can gain some insight by considering the high and low life expectancy variants ... intended to represent plausible alternative assumptions and are far from reflecting the extremes of thinking on future mortality.”

(Office for National Statistics, 2008, National Population Projections 2006-based Series PP2 No 26, ed. Helen Bray, p. 33)

Variants: underlying rate of improvement

Low	0%
Principal	1%
High	2%
<i>Very high</i>	<i>3%*</i>

All include cohort term (maximum 1.5% p.a. improvement over underlying value in 1931)

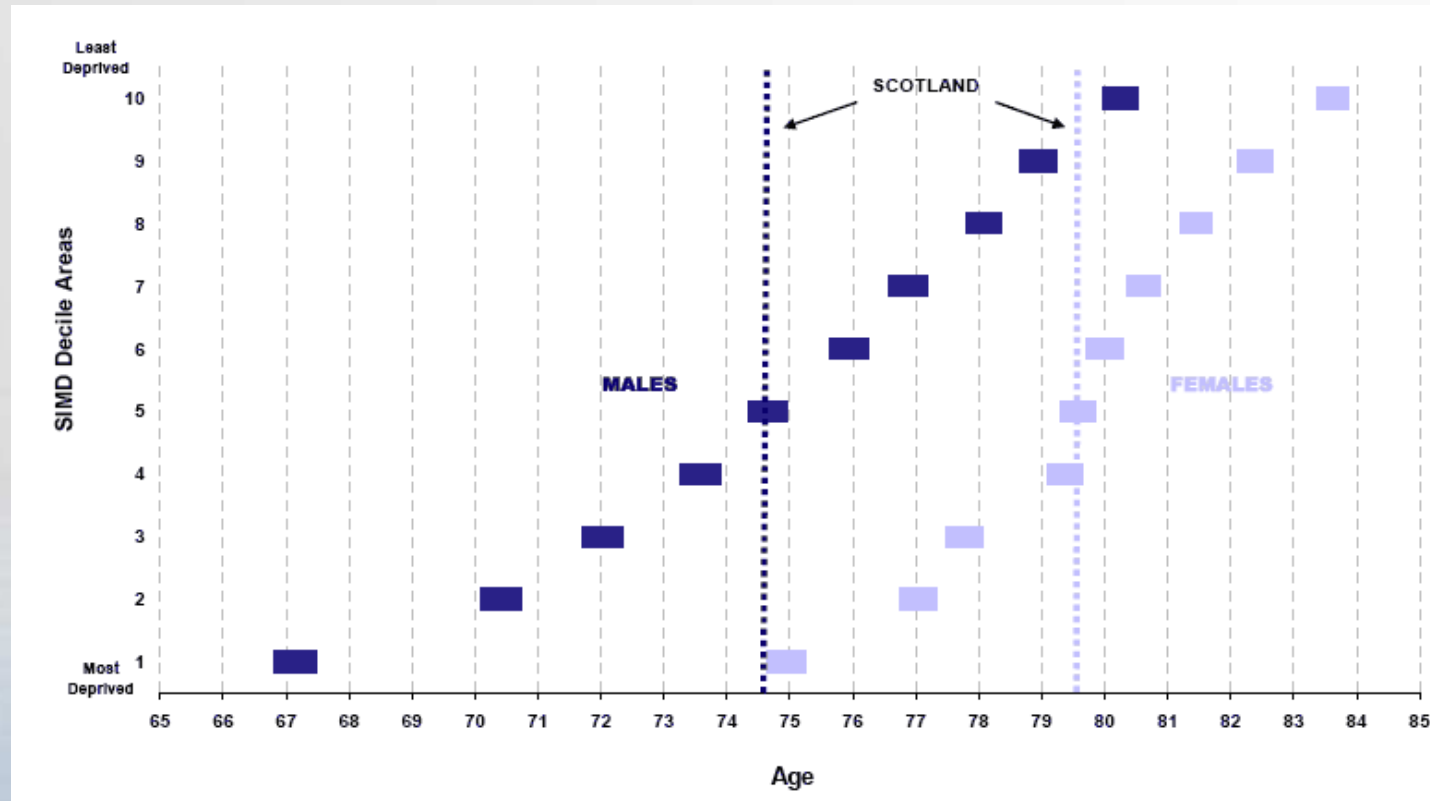
*(*Own projection, others are taken from PP2 No. 26)*

Life expectancy projections: US (2008) and UK (2006-based) variant values

	Value	Change from 2010			
	2010	2020	2030	2040	2050
<u>Males</u>					
US (Prin)	75.7	1.3	2.7	3.9	5.2
UK (Prin)	78.7	3.3	5.7	7.2	8.4
UK (High)	78.9	3.6	6.6	9.1	11.4
UK (V. high)	79.2	3.9	7.4	10.9	14.3
<u>Females</u>					
US (Prin)	80.8	1.2	2.3	3.5	4.5
UK (Prin)	82.4	2.2	4.3	5.9	7.0
UK (High)	82.6	2.4	4.9	7.1	9.1
UK (V. high)	82.8	2.6	5.4	8.3	11.3

National variability: scope for improvement?

Life expectancy at birth with 95% confidence intervals for Scottish Index Multiple Deprivation 2006 Decile area, 2004-2006 (Males & Females)



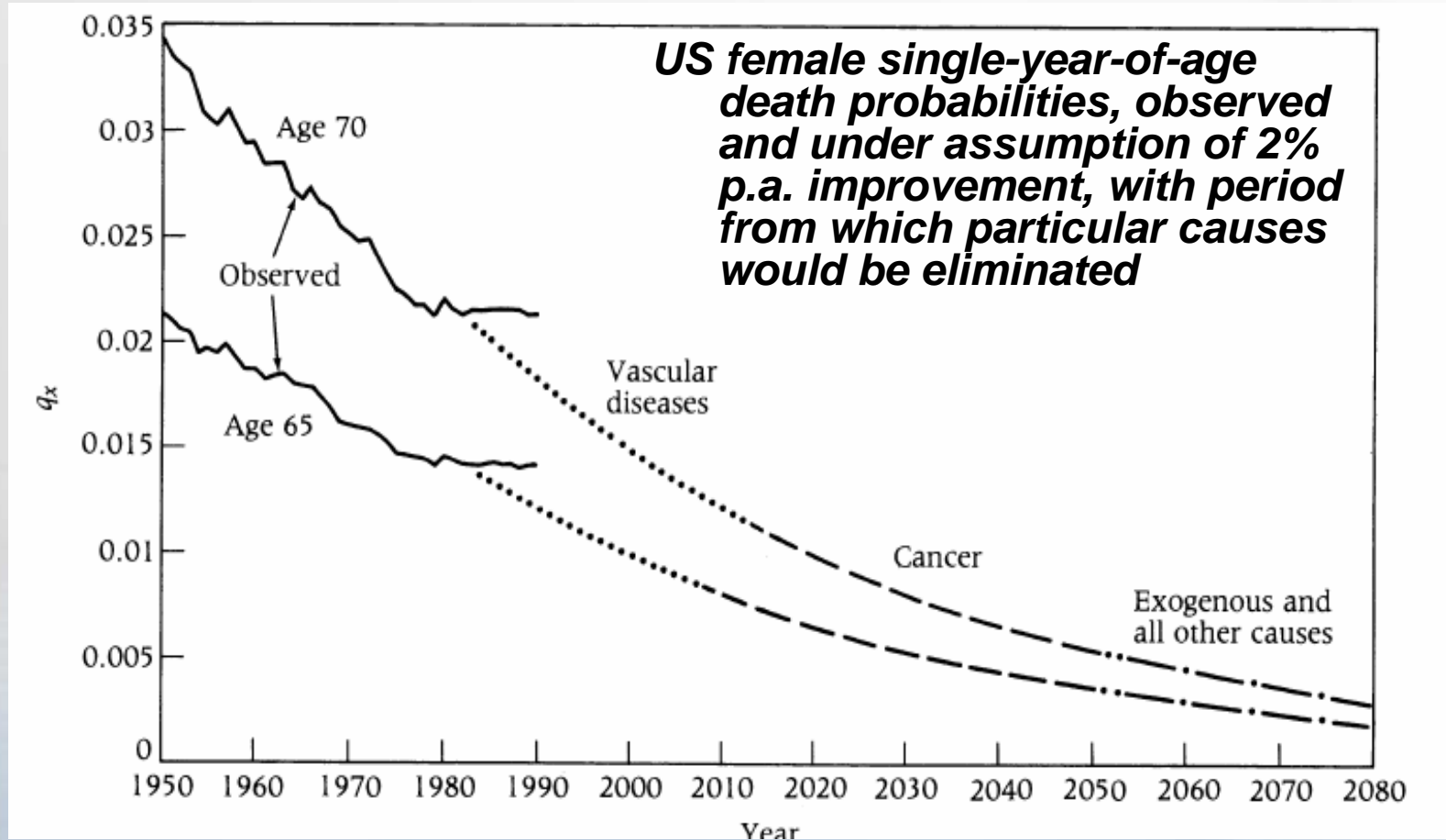
<http://www.gro-scotland.gov.uk/files1/stats/gros-life-expectancy-in-special-areas-within-scotland-2004-2006/j950403.htm>

International & national context

British mortality projections are among the most optimistic in the World for in the next 40 years or so

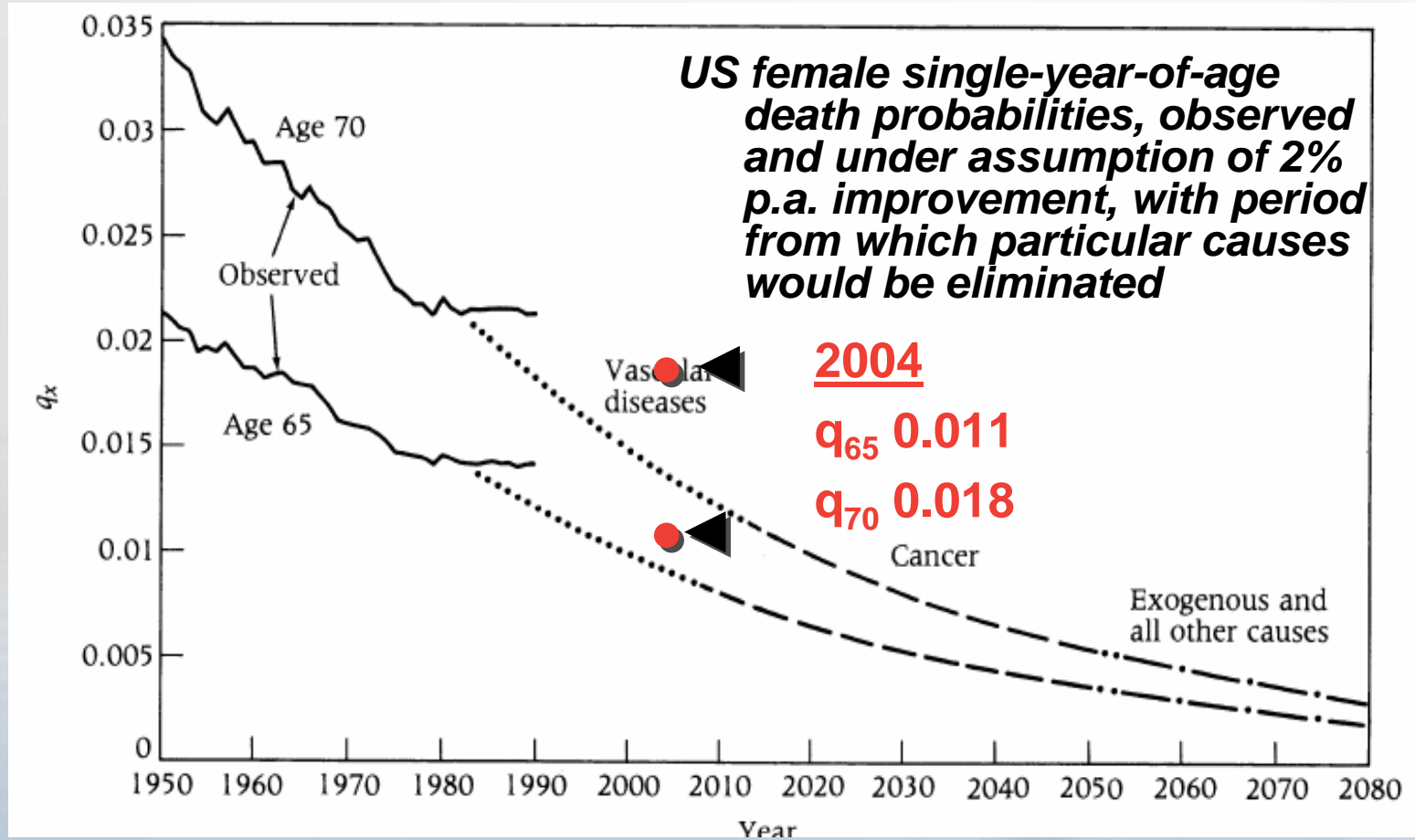
The differences in life expectancy between 2010 and 2050 even for the high variant are similar to that between values in the top and bottom deprivation deciles in Scotland

Are sustained high rates of mortality improvement possible?



S. Jay Olshansky and Bruce A. Carnes, *Demographic Perspectives on Human Senescence*
Population and Development Review, 20(1):57-80 (1994), Figure 8

Are sustained high rates of mortality improvement possible?



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Some issues in predicting future life expectancy that should be considered

In the absence of clear consensus on empirical balance of competing future effects, why not retain current patterns?

- Accelerating rates of improvement*
- Cohort “effects” not proven*
- More attention to whether cohorts are “pseudo-cohorts”*
- Sensible to investigate implications of populations with higher rates of mortality improvement*

What alternative methods of estimating life expectancy are available?

Thank you for your attention