



Office for
National Statistics

Scottish mortality: past, present and future

PAMS conference, 30 October 2009

Adrian Gallop, ONS

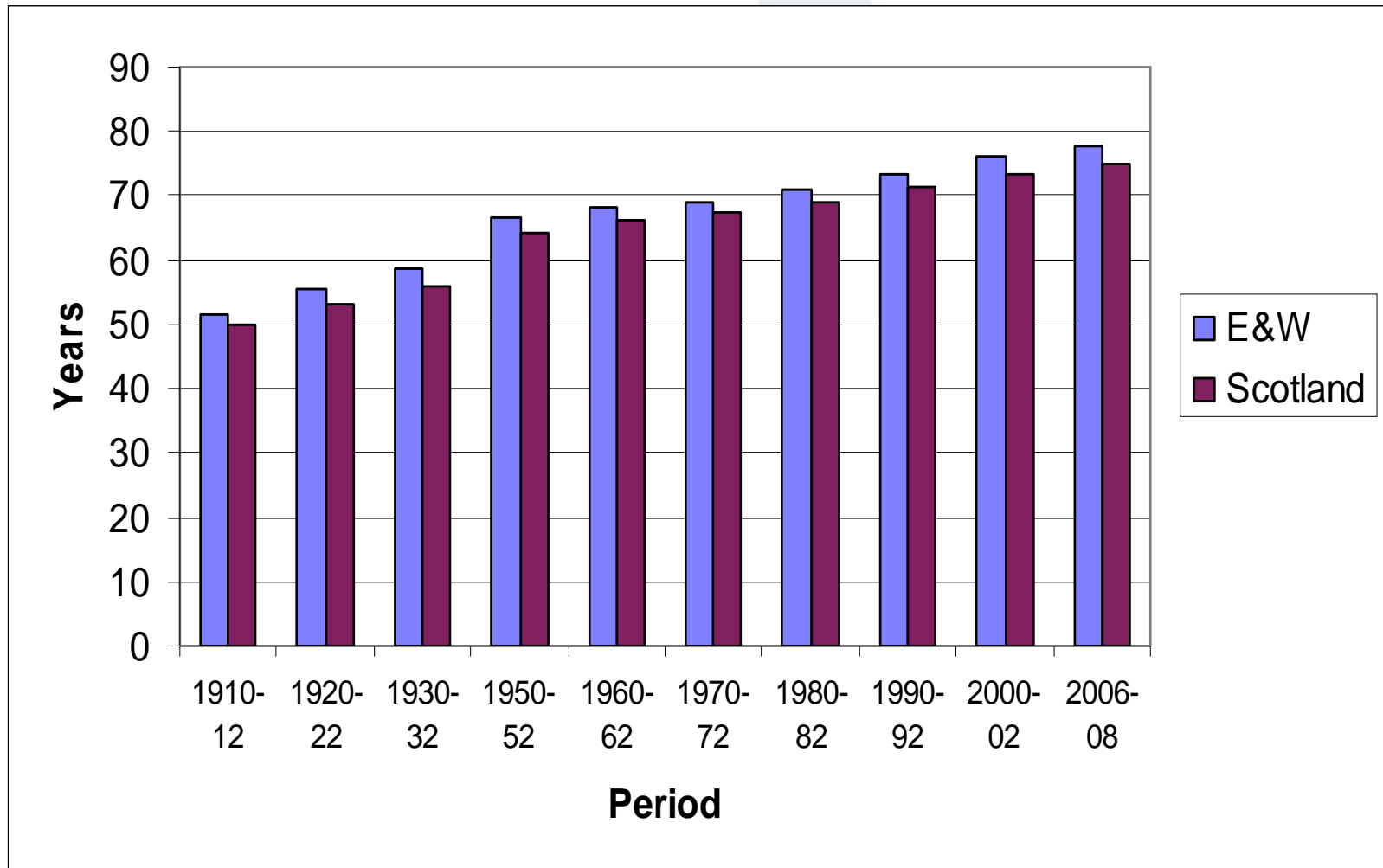
Scottish mortality

- Historical data
- Comparison to E&W/UK
- Current longevity
- Projected longevity

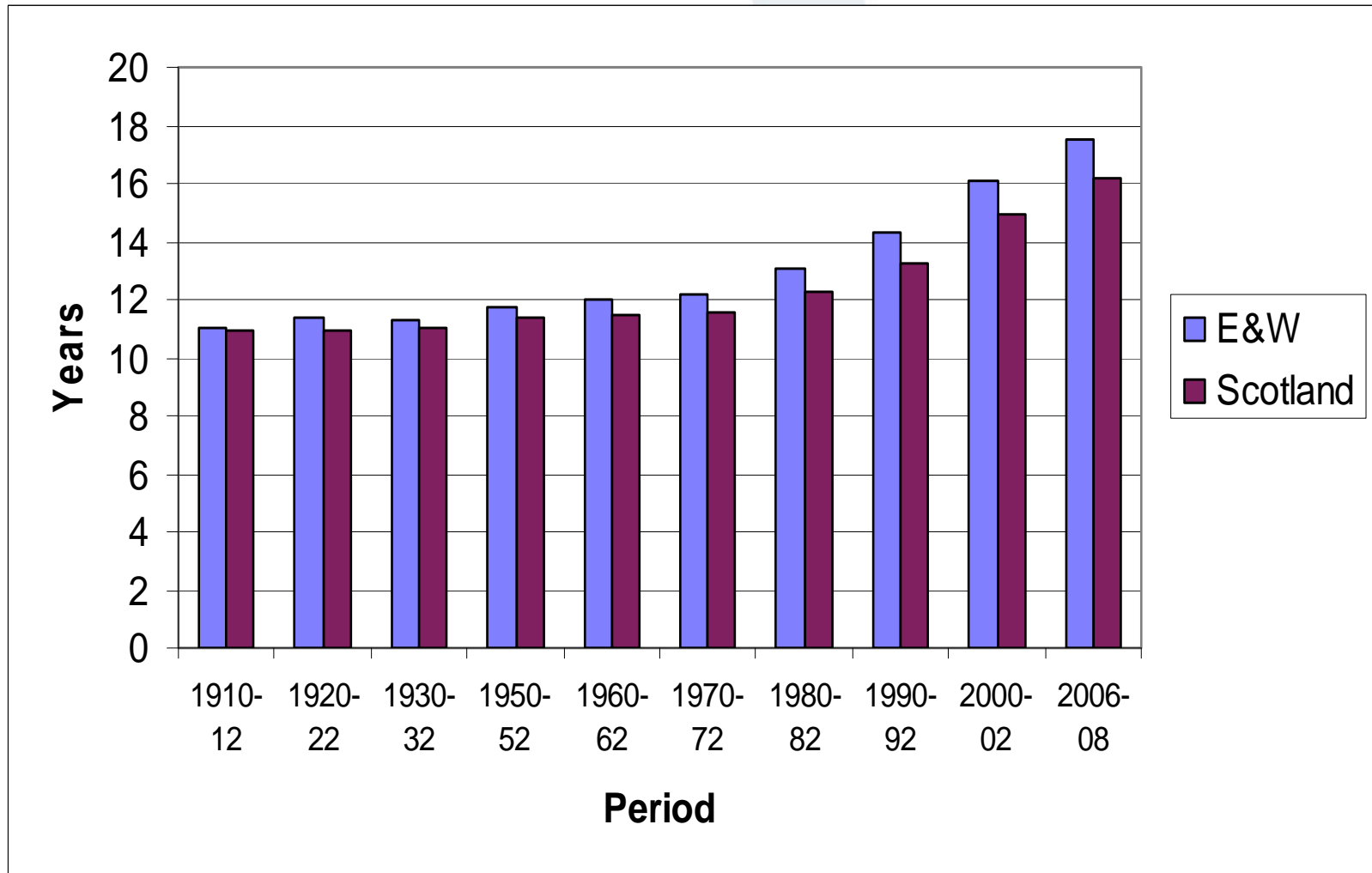
Period life expectancy 2006-08

| | Life expectancy at birth | | Life expectancy at age 65 | |
|------------------|--------------------------|---------|---------------------------|---------|
| | Males | Females | Males | Females |
| UK | 77.4 | 81.6 | 17.4 | 20.0 |
| England | 77.7 | 81.9 | 17.5 | 20.2 |
| Wales | 76.9 | 81.2 | 17.1 | 19.8 |
| Northern Ireland | 76.3 | 81.2 | 16.8 | 19.8 |
| Scotland | 75.0 | 79.9 | 16.2 | 18.8 |

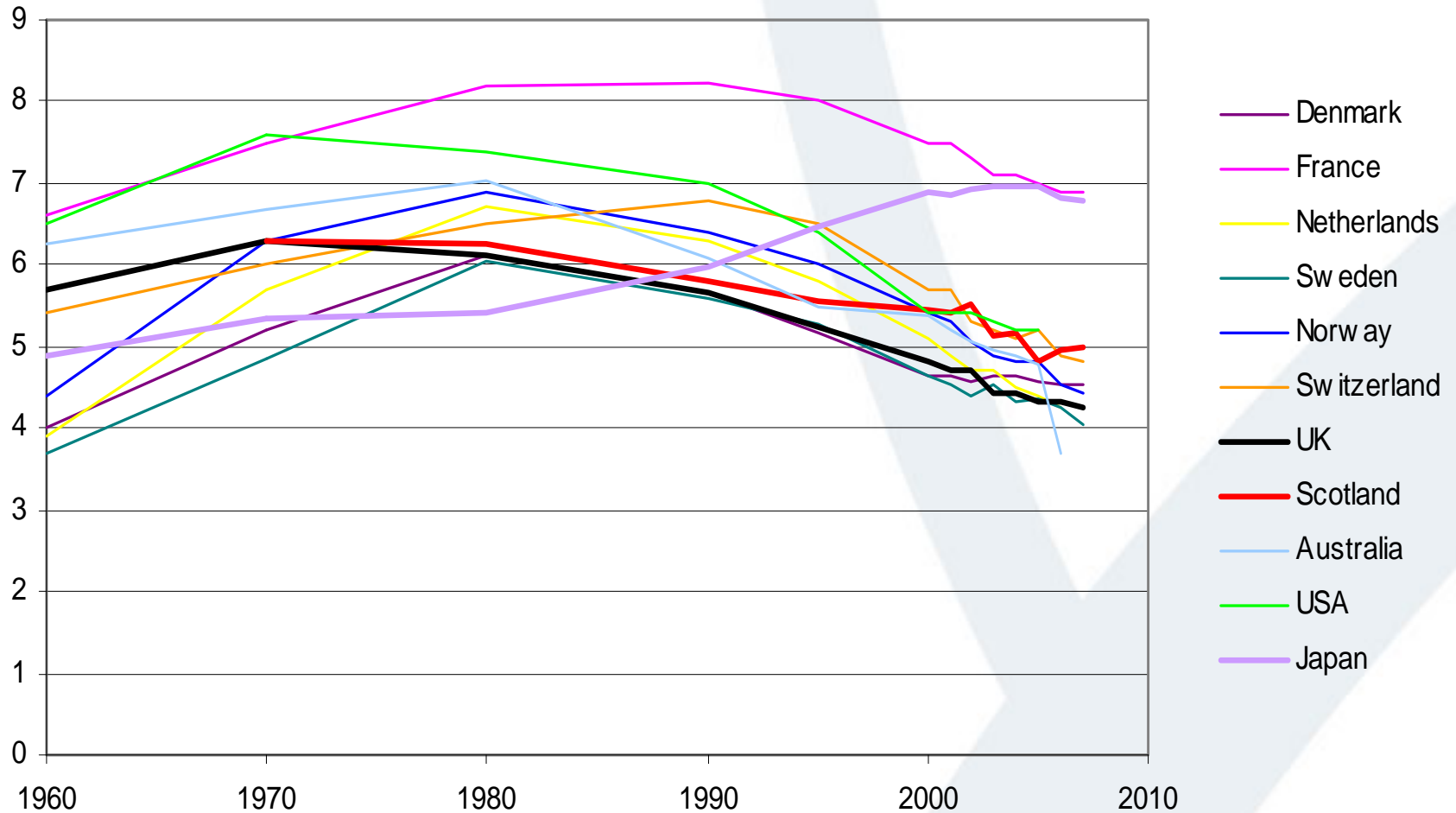
Period expectation of life at birth, Males



Period expectation of life at age 65, Males

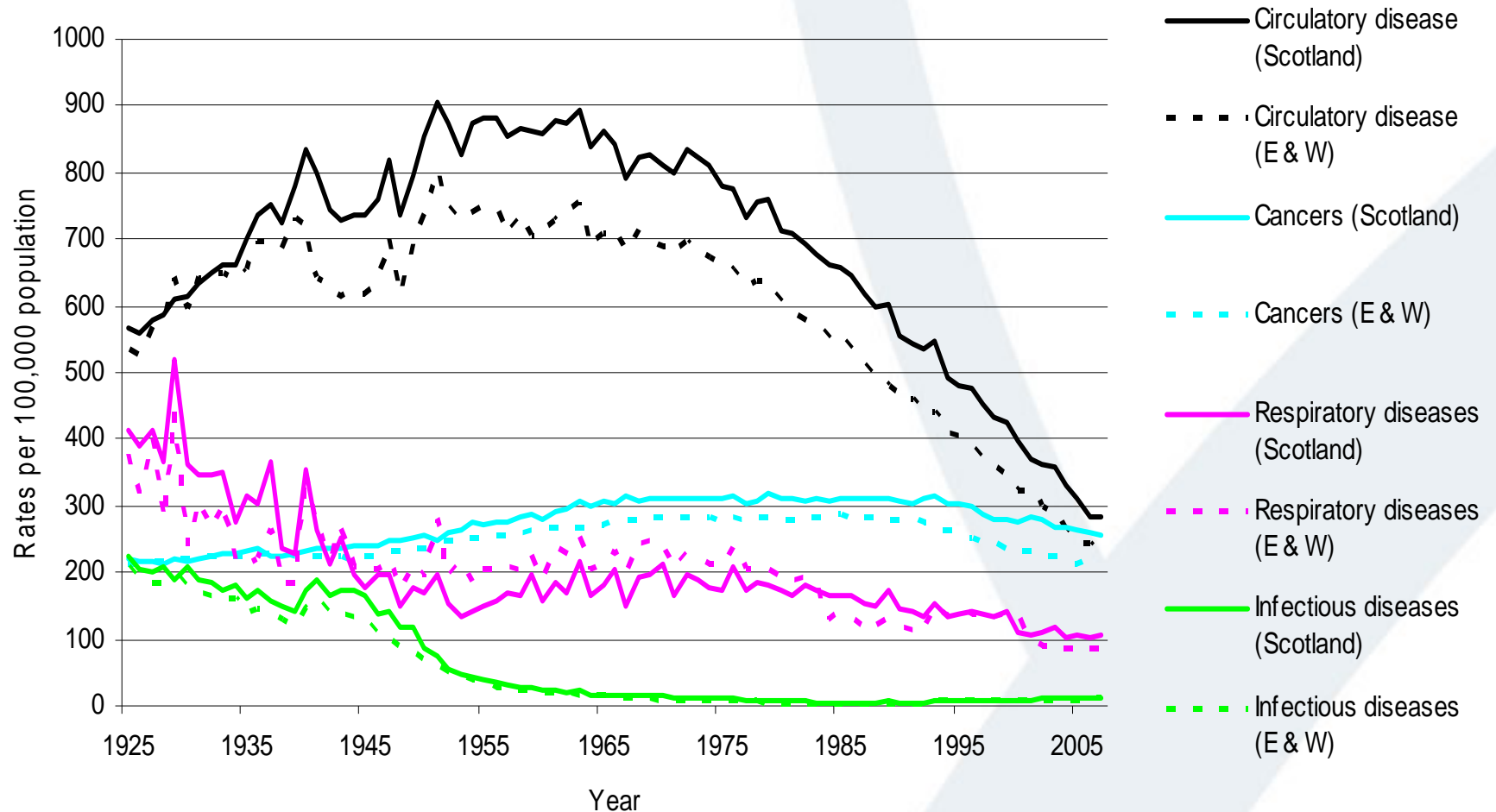


Female – Male EoIB: selected countries



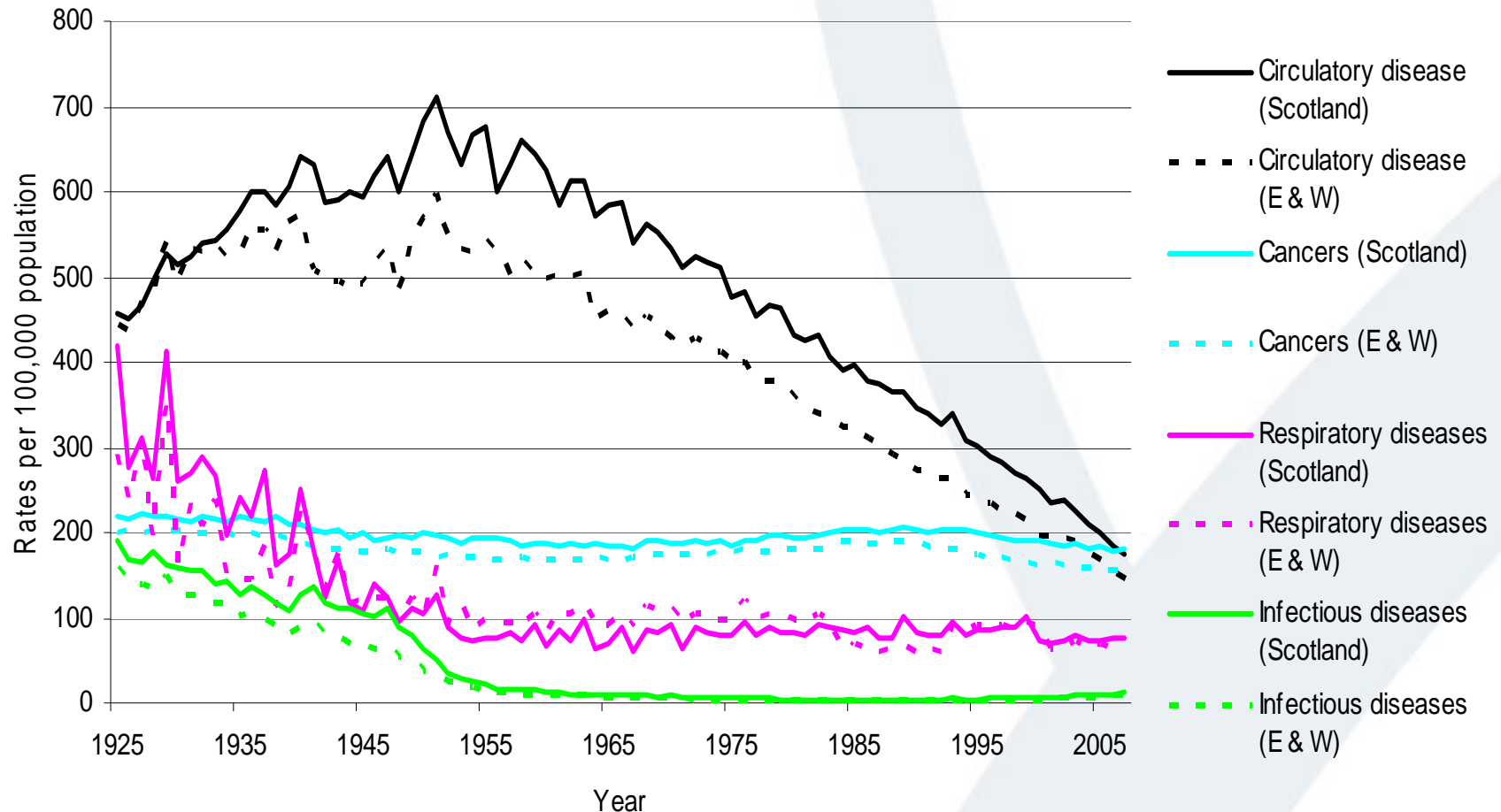
Male mortality by major cause, Scotland 1925-2007

Age standardised mortality rates for selected broad disease groups



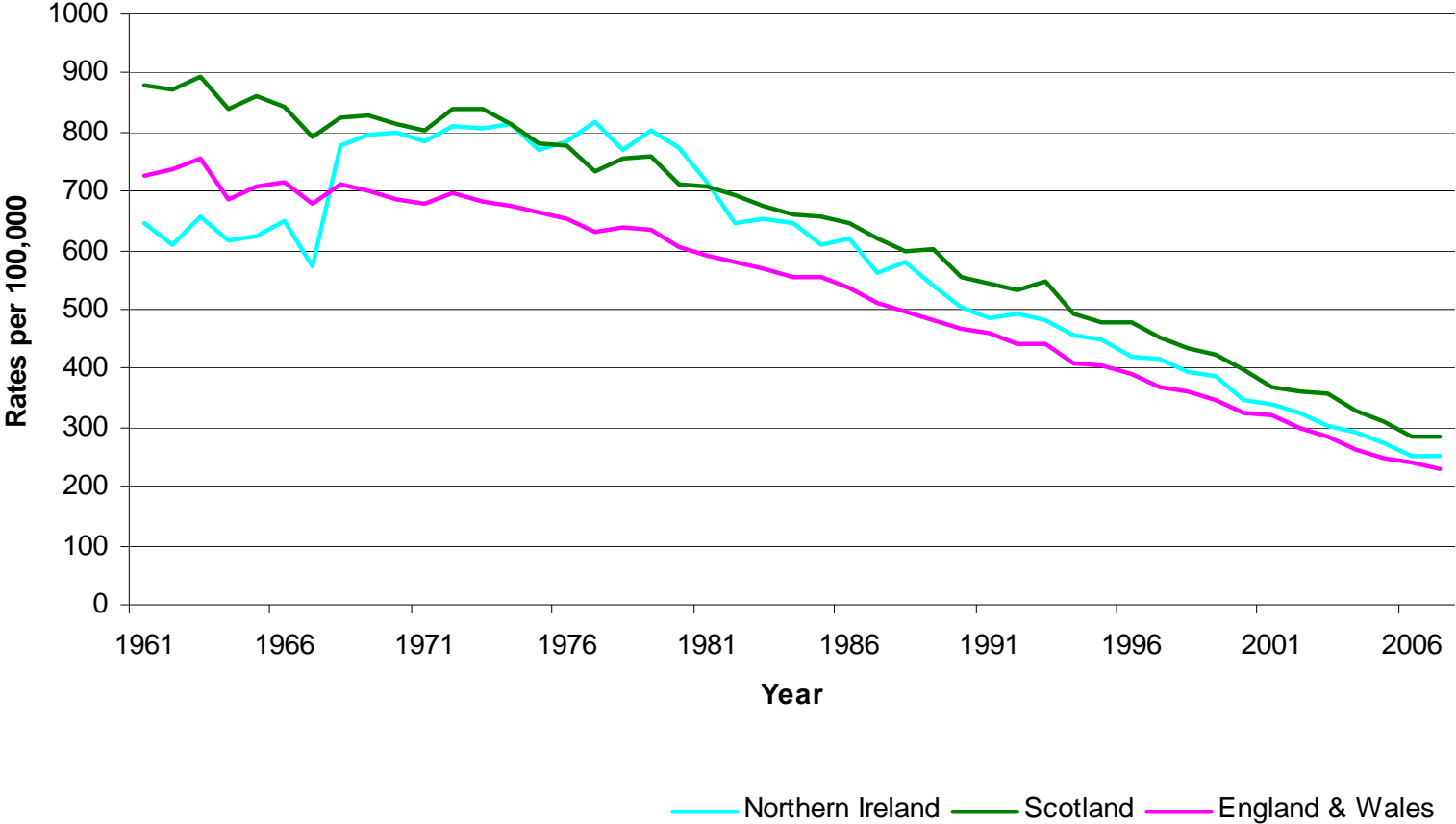
Female mortality by major cause, Scotland 1925-2007

Age standardised mortality rates for selected broad disease groups

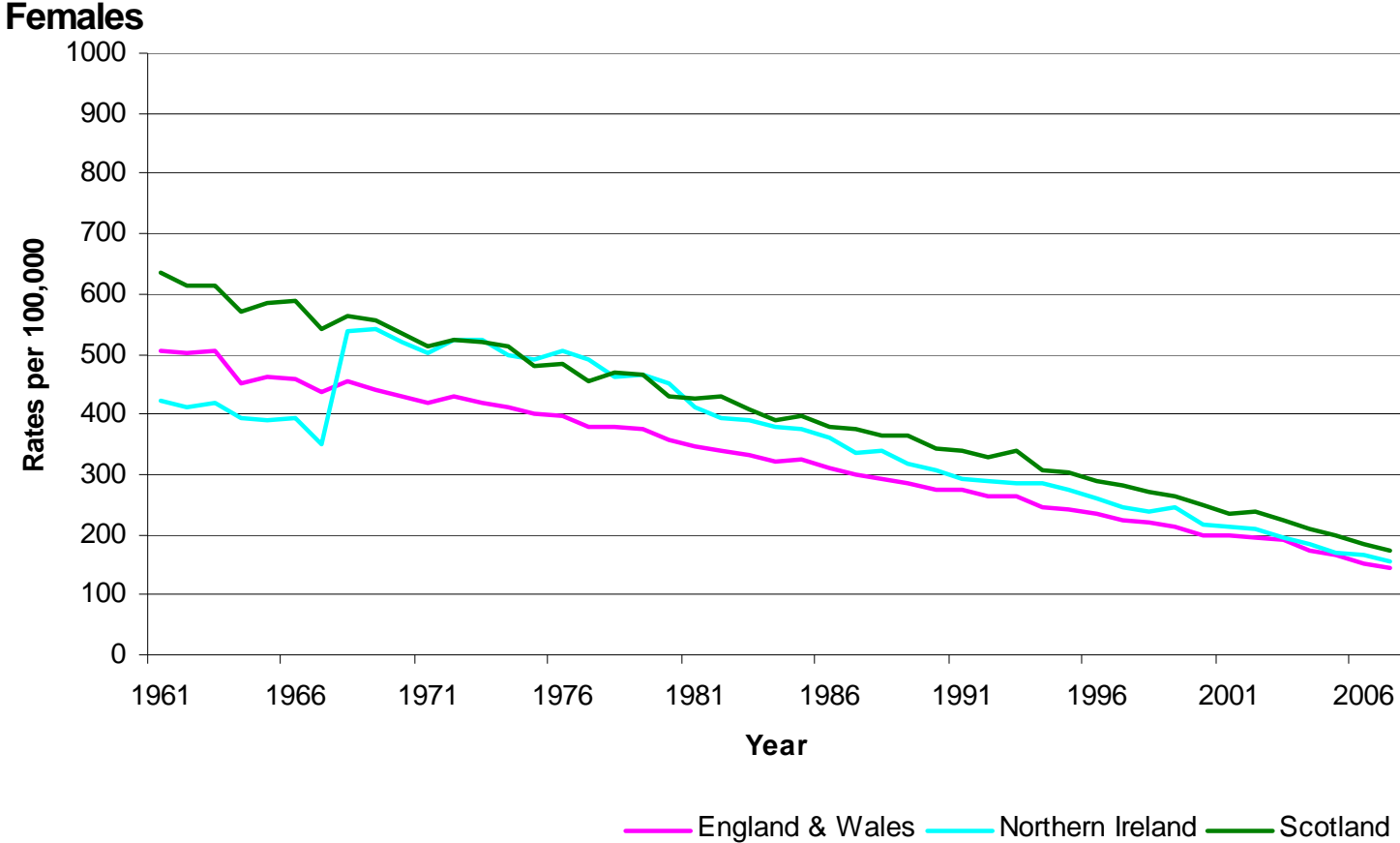


ASMRs – Circulatory diseases

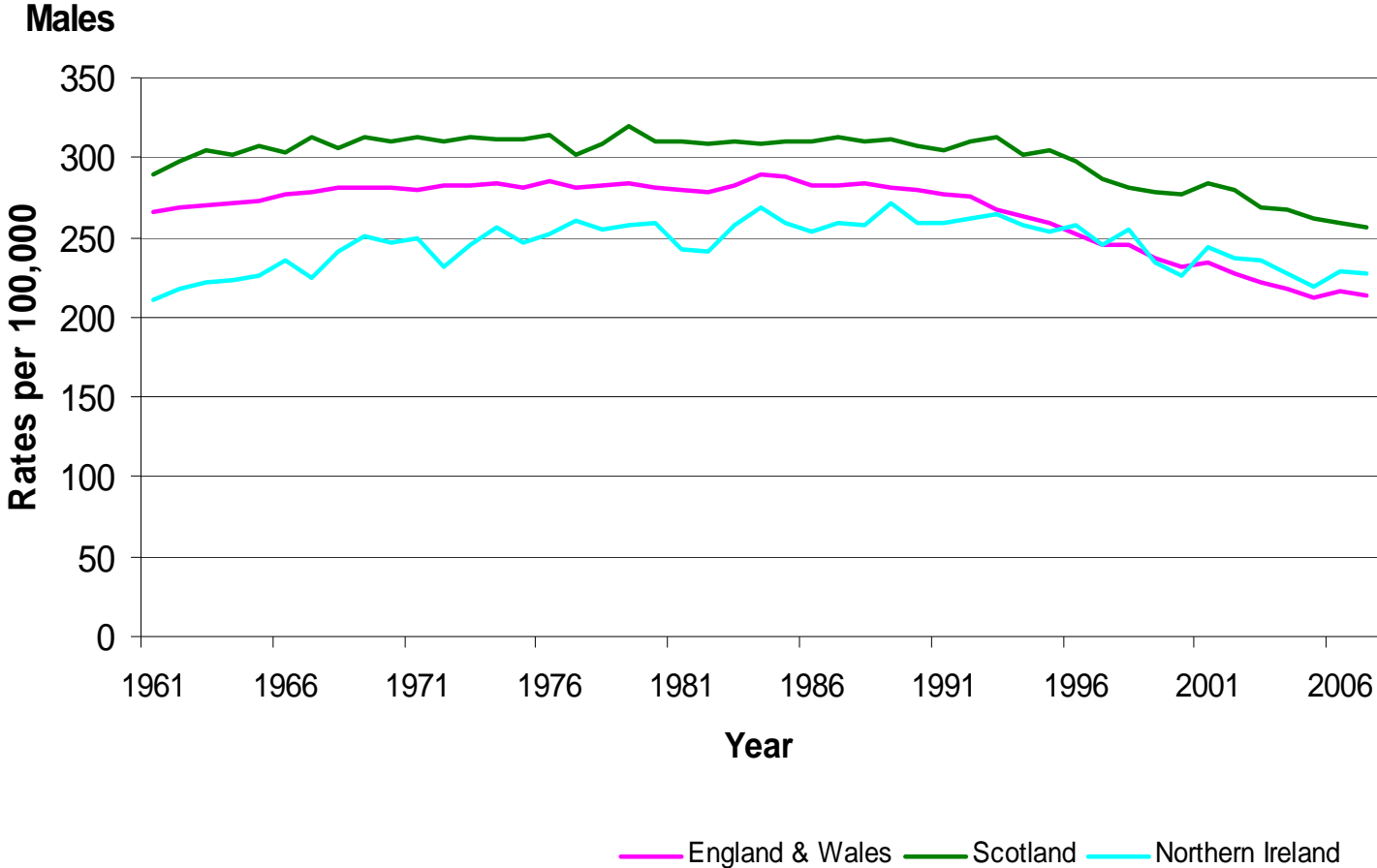
Males



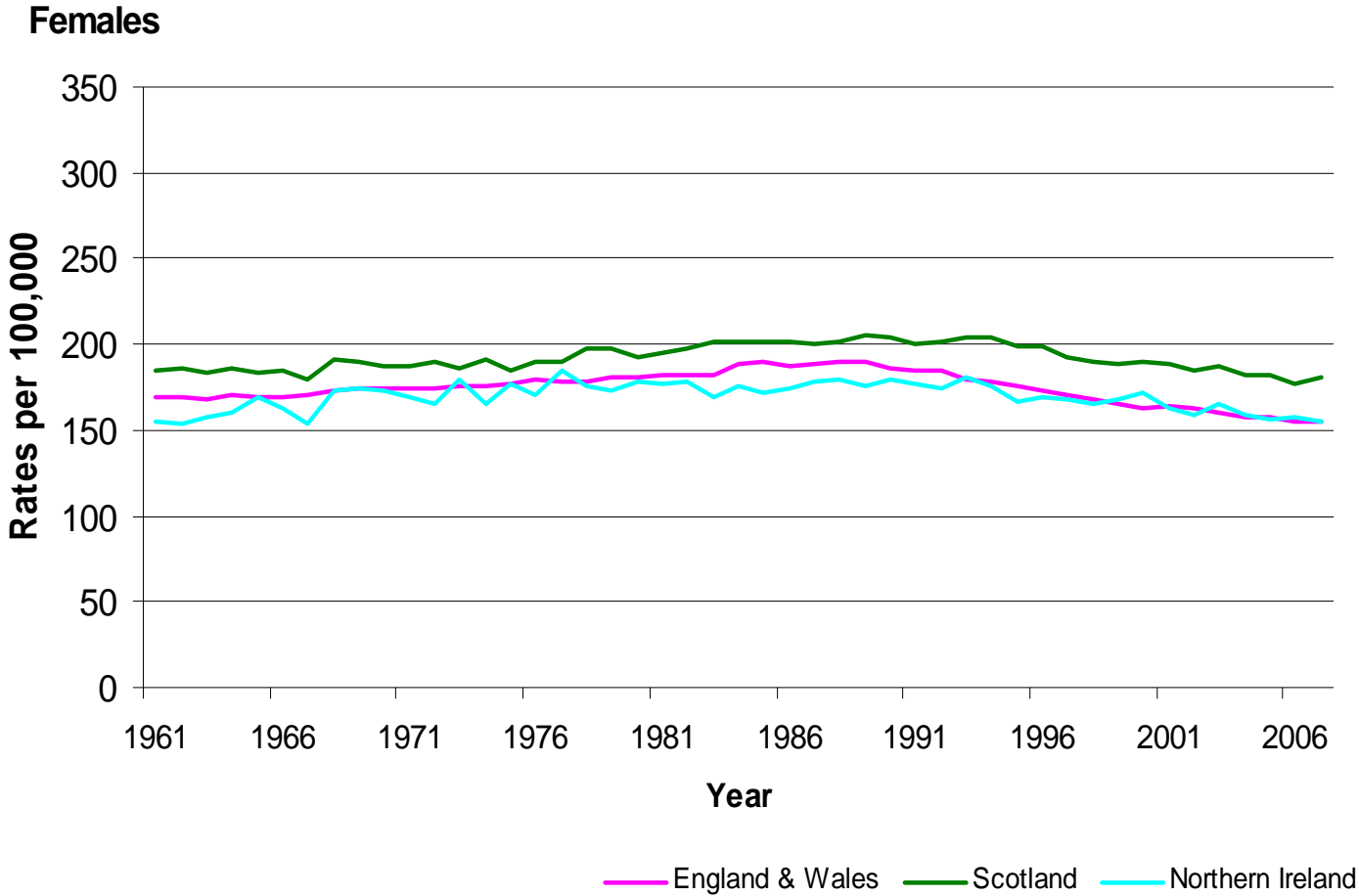
ASMRs – Circulatory diseases



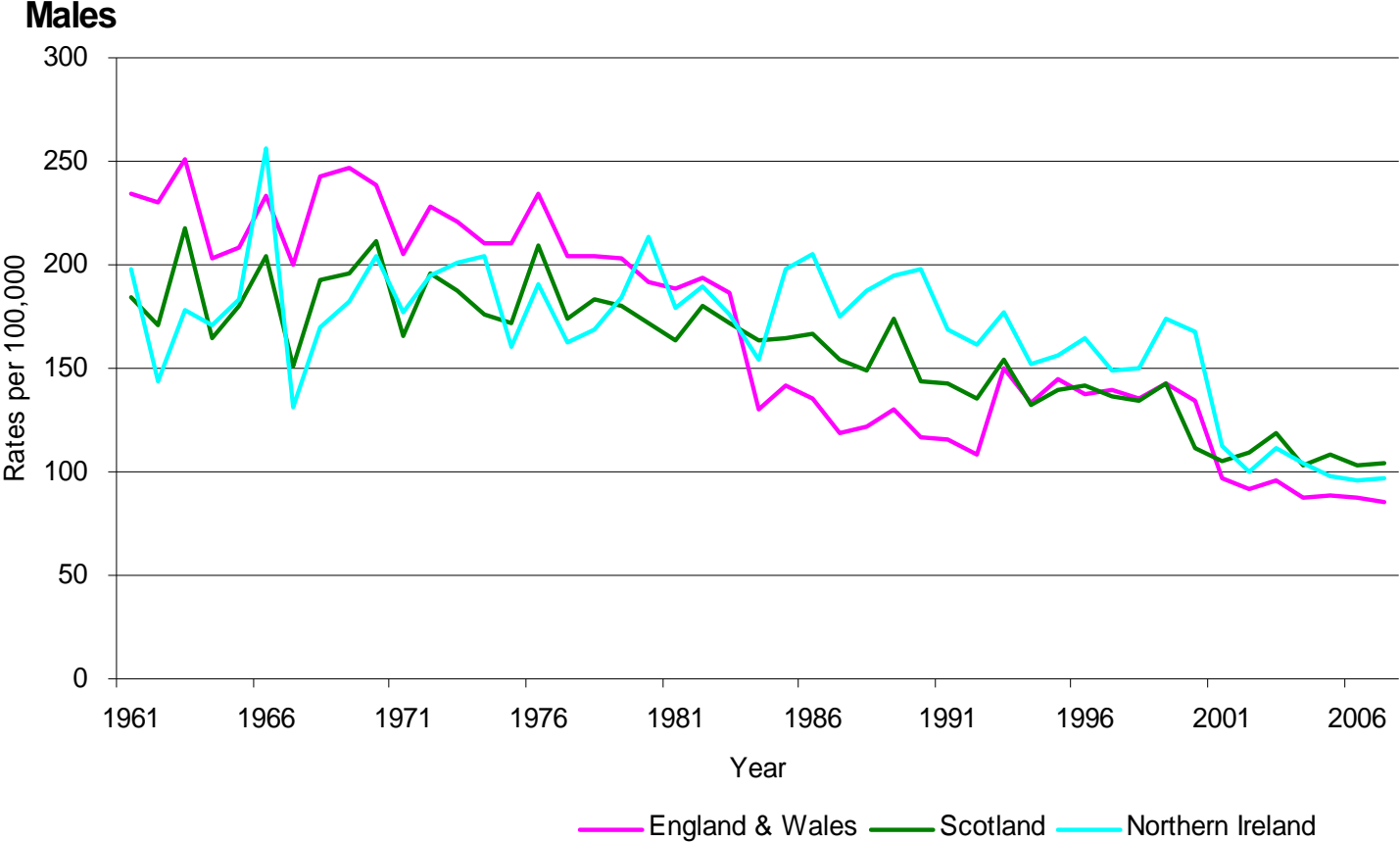
ASMRs – Cancers



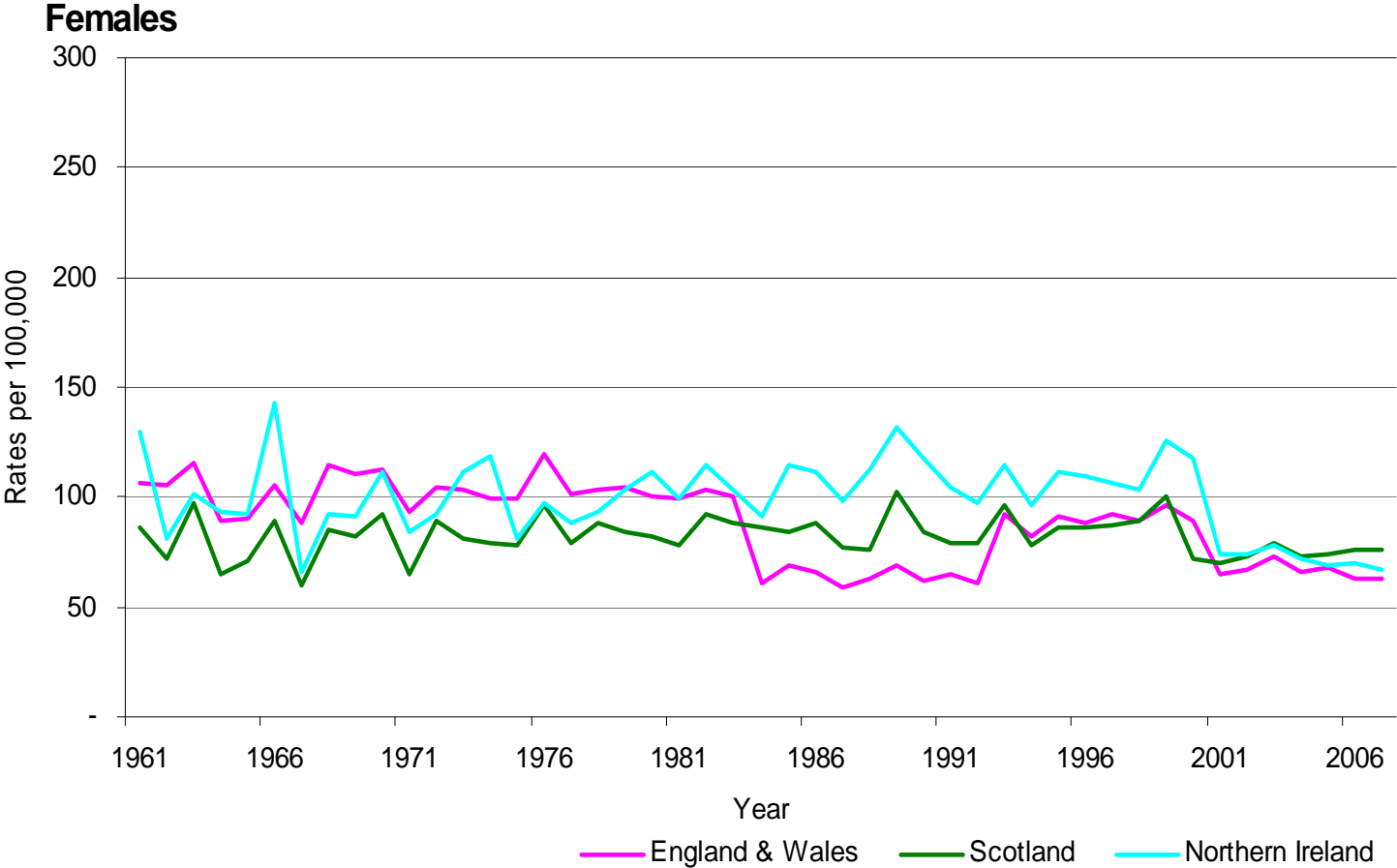
ASMRs – Cancers



ASMRs – Respiratory diseases

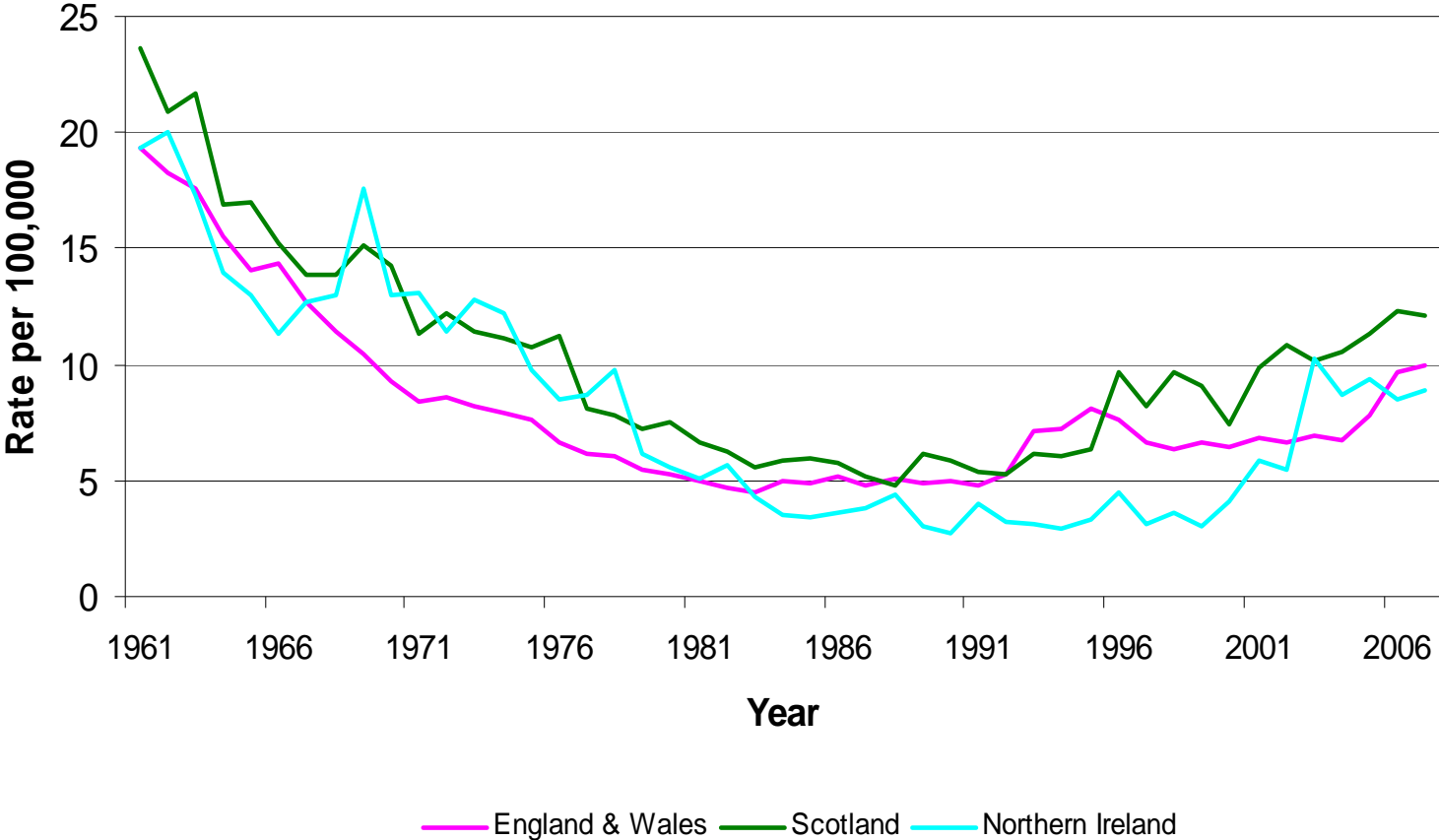


ASMRs – Respiratory diseases

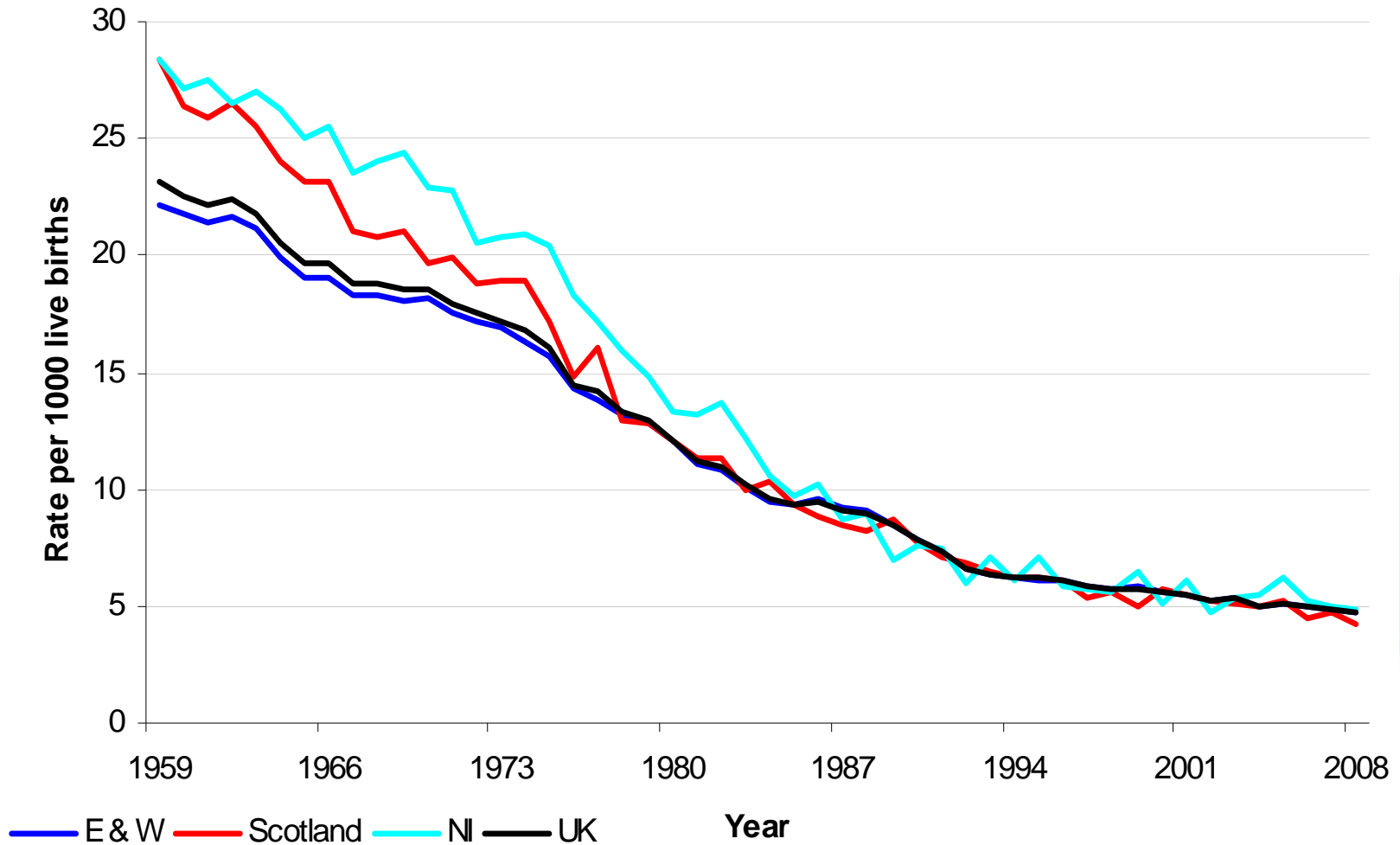


ASMRs – Infectious diseases

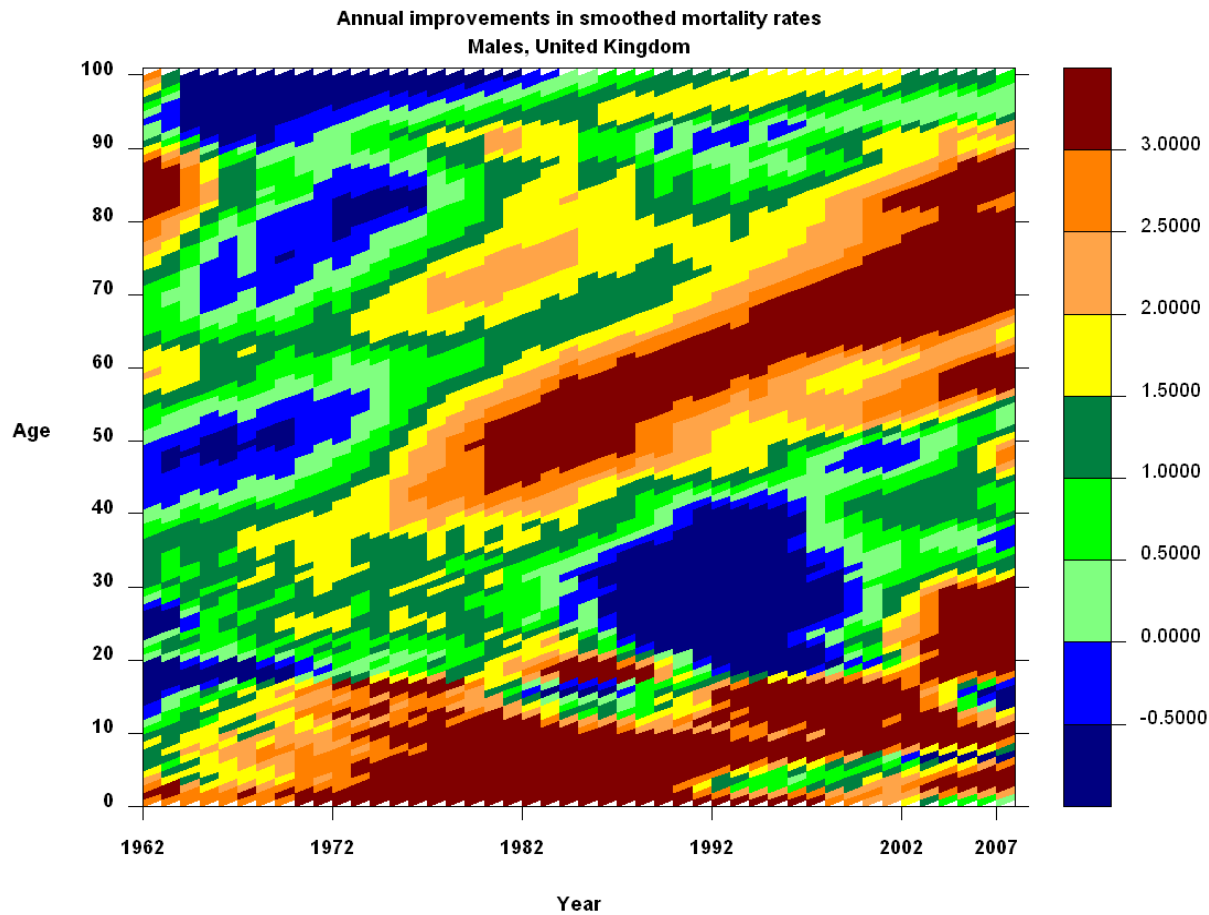
Males



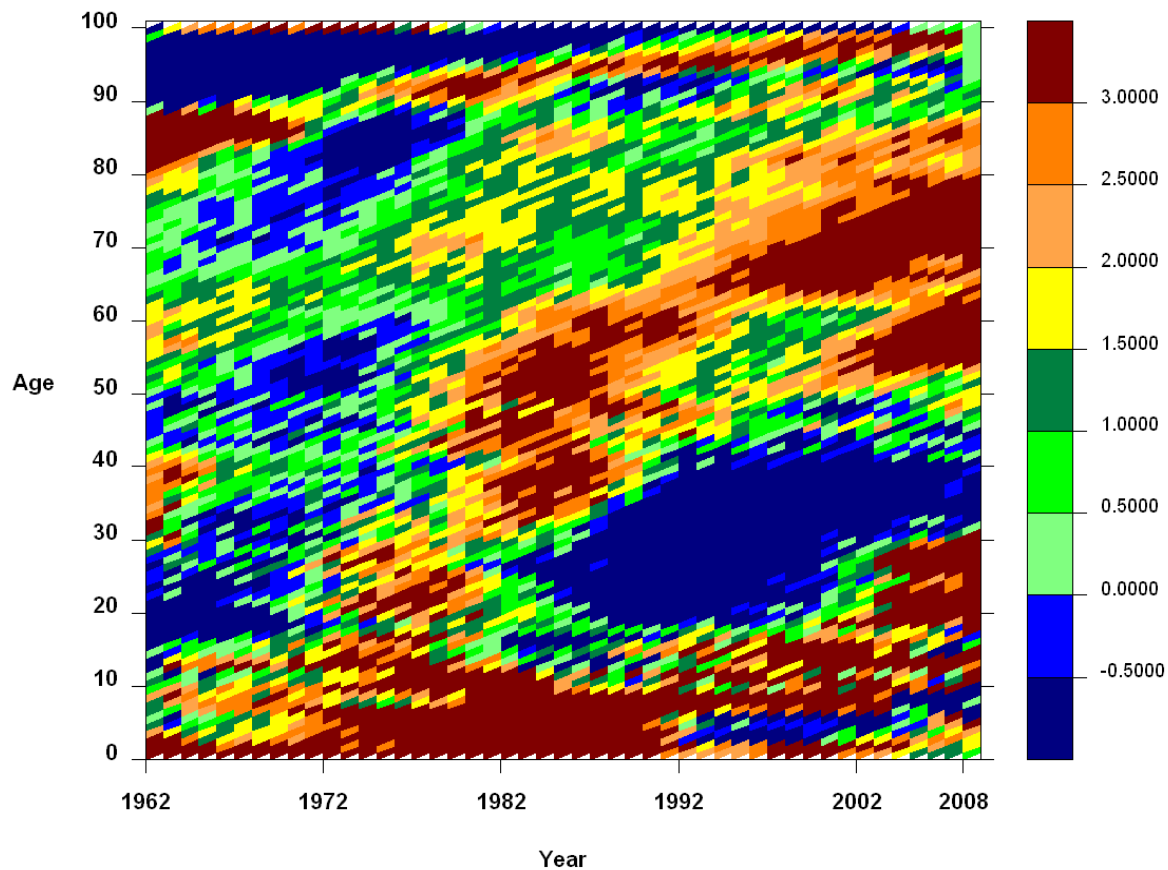
IMRs, UK and constituent countries, 1959 to 2008



Annual improvements in smoothed mortality rates, Males, UK



Annual improvements in smoothed mortality rates, Males, Scotland



Potential drivers for future mortality change

- Changes in bio-medical technology
- Effectiveness of health care systems
- Behavioural changes related to health:
 - ❖ Decline in smoking prevalence
 - ❖ Lifestyles
 - ❖ Obesity
- Emergence of new diseases (eg HIV, SARS)
- Re-emergence of old diseases (eg TB)
- Environmental change, disasters, wars
- Changes in population composition; cohort effects, migrants

UK Population Mortality Projections

Methodology

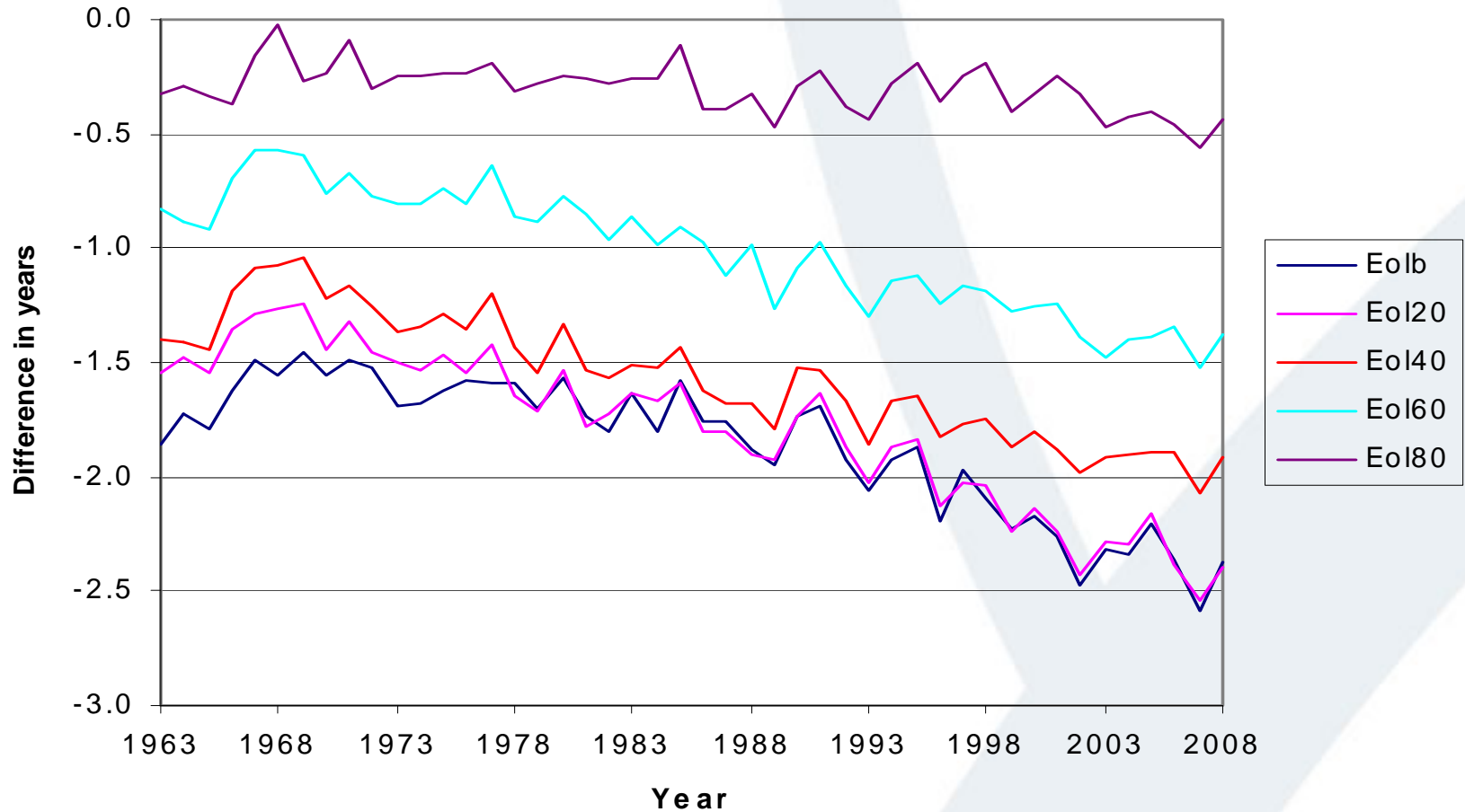
- Estimate current rates of mortality improvement by age and gender
- Set target rates of mortality improvement for some future year (the target year)
- Make assumptions on method and speed of convergence of current improvement rates to target rates and how improvement rates change after target year
- Apply successively to assumed base mortality rates
- Carry out for UK as a whole
- Compare against data for each country and adjust

Choice of target rate

- Rates of improvement at older ages most important
- Standardised average rate of improvement over 20th century $\approx 1.0\%$ pa
- Cohorts exhibiting greatest improvement will be aged 90-105 in 2033 so likely to contribute less to overall rate of improvement
- Debate as to whether future technical, medical and environmental changes will have greater or lesser impact than in the past

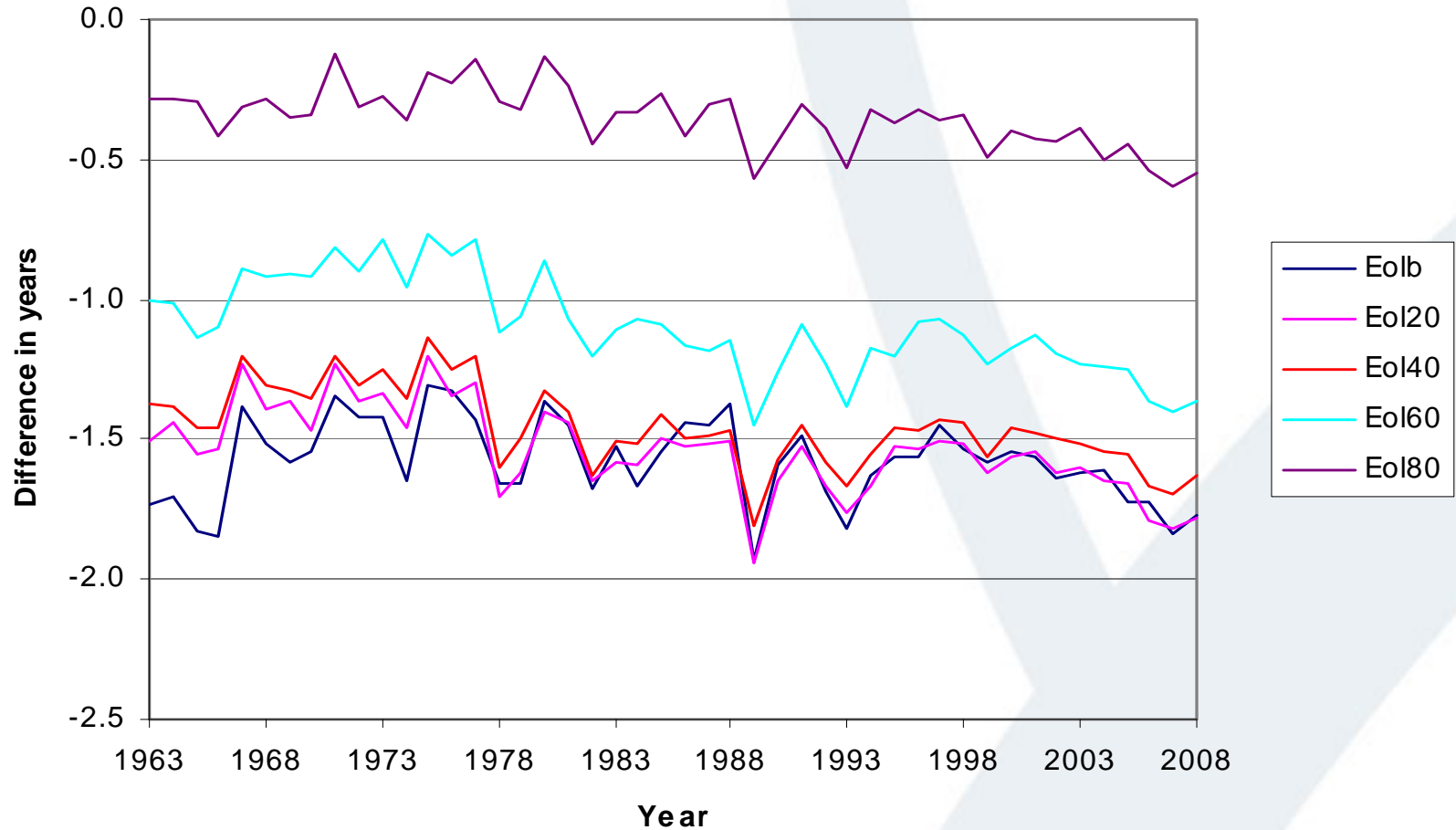
Comparison of eols – Scotland with UK

Males

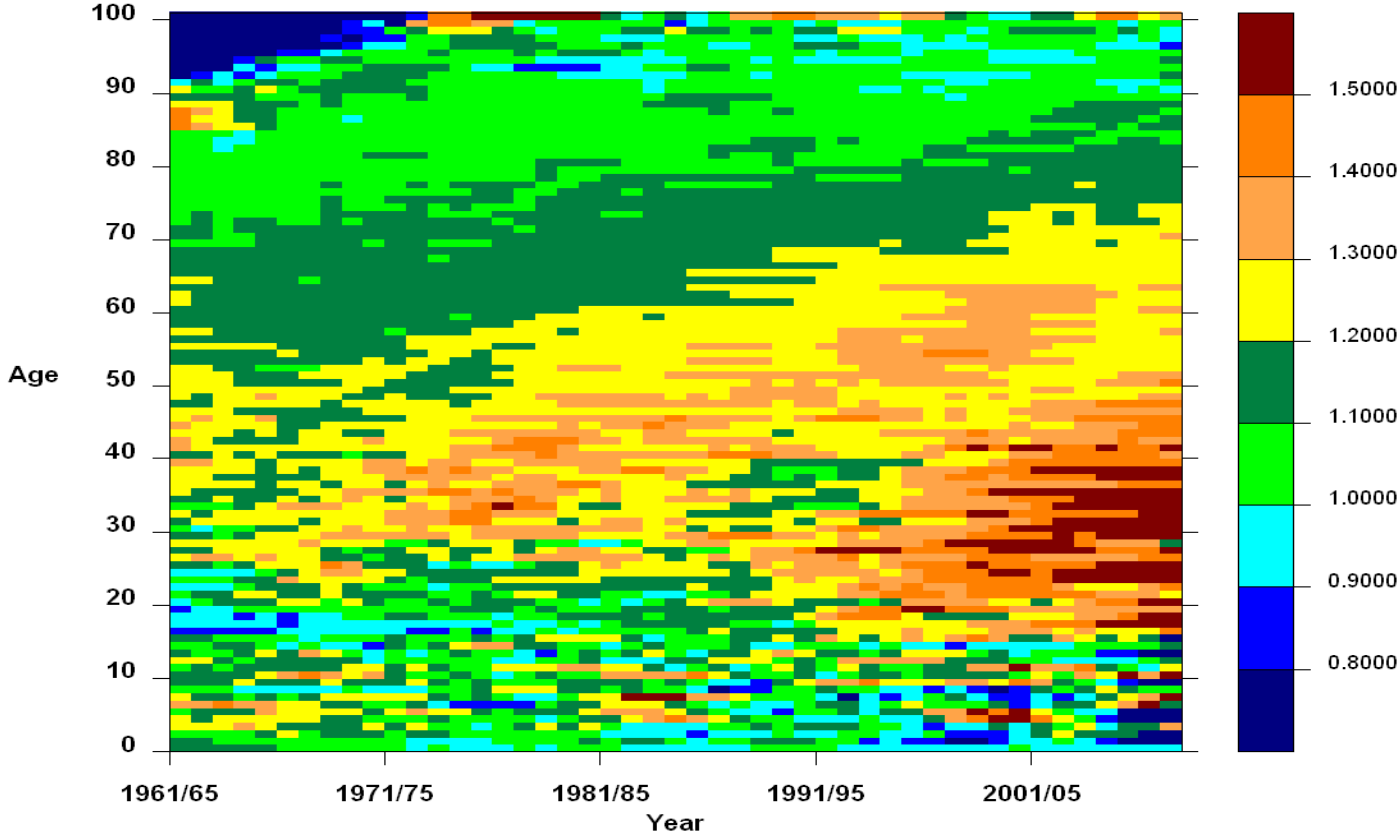


Comparison of eols – Scotland with UK

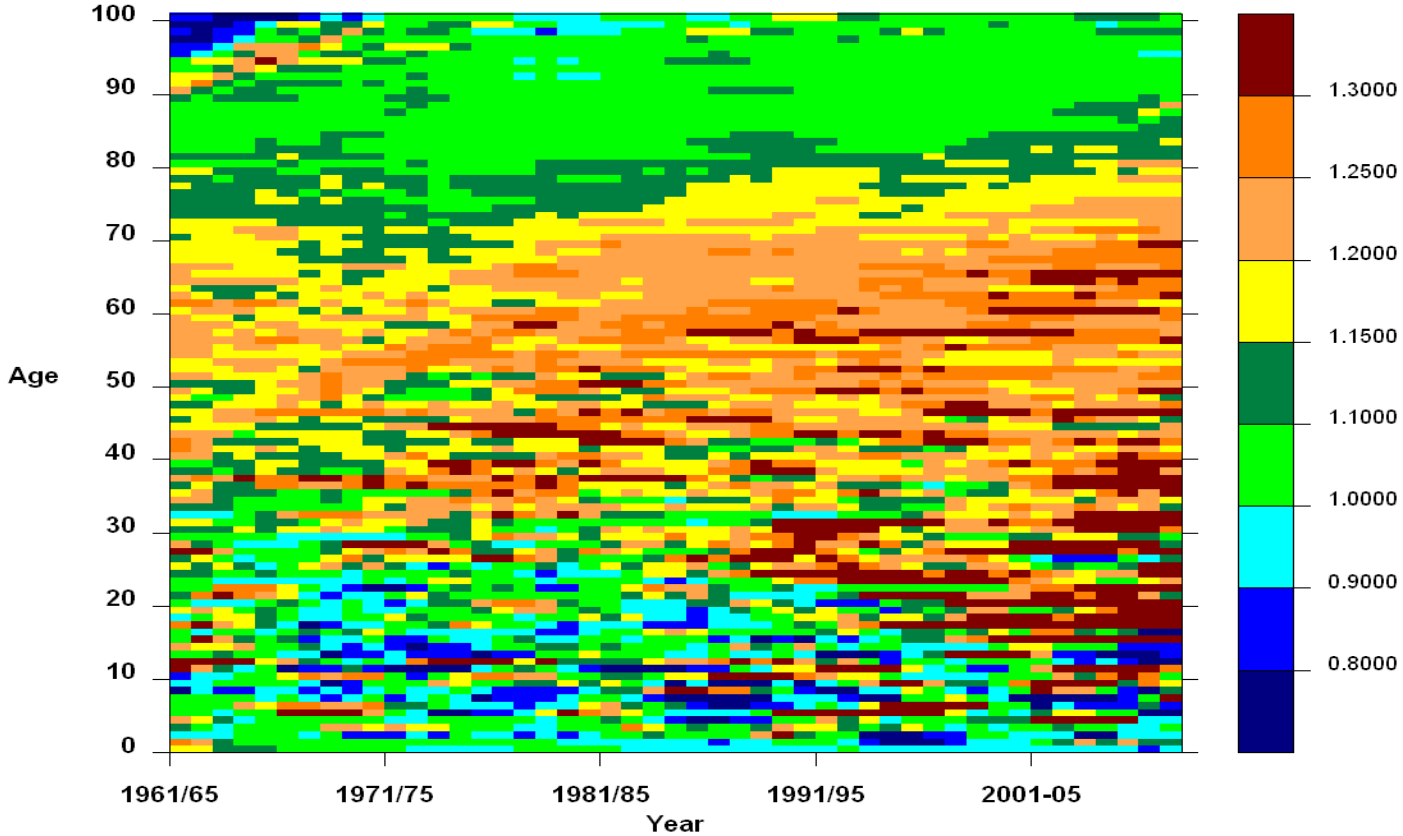
Females



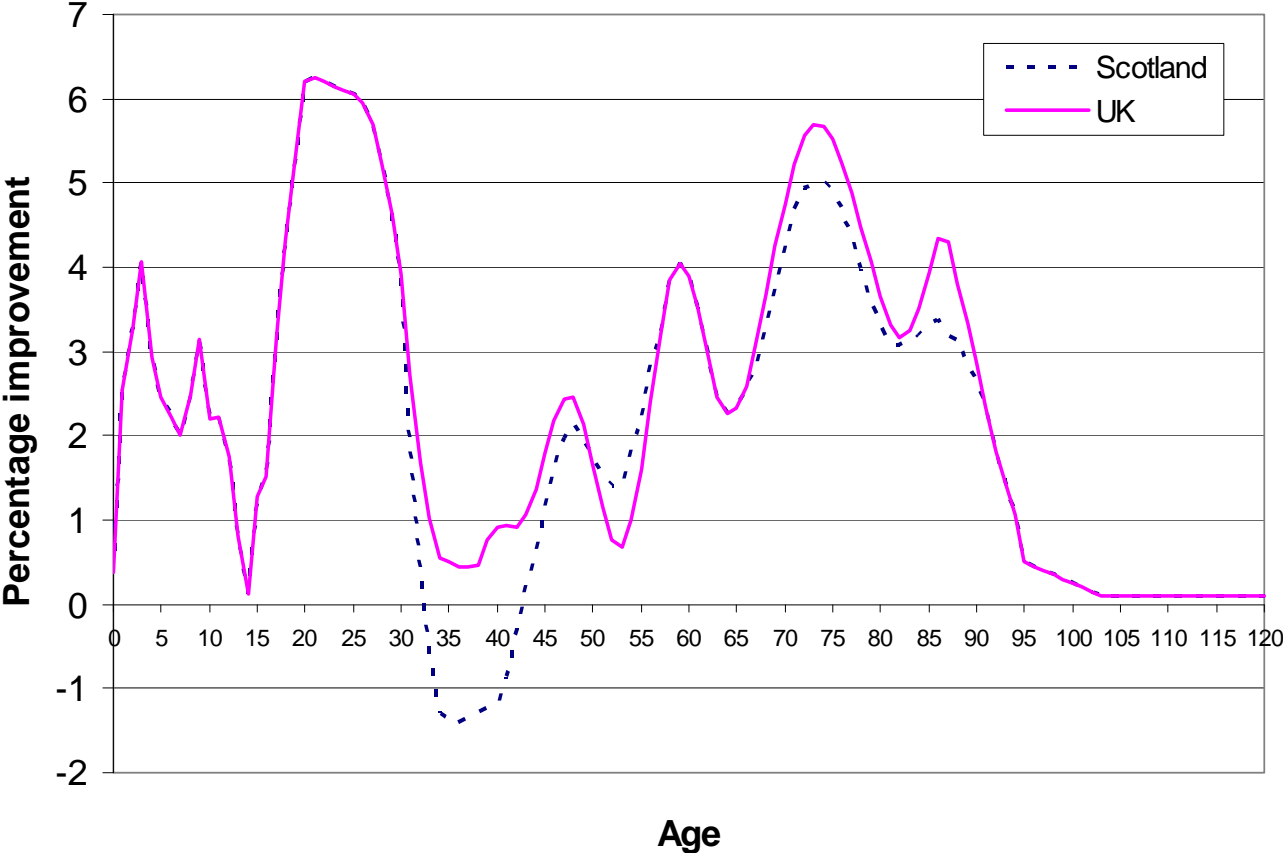
Scottish mx/UK mx, Males, ratio of 5 year average mx values)



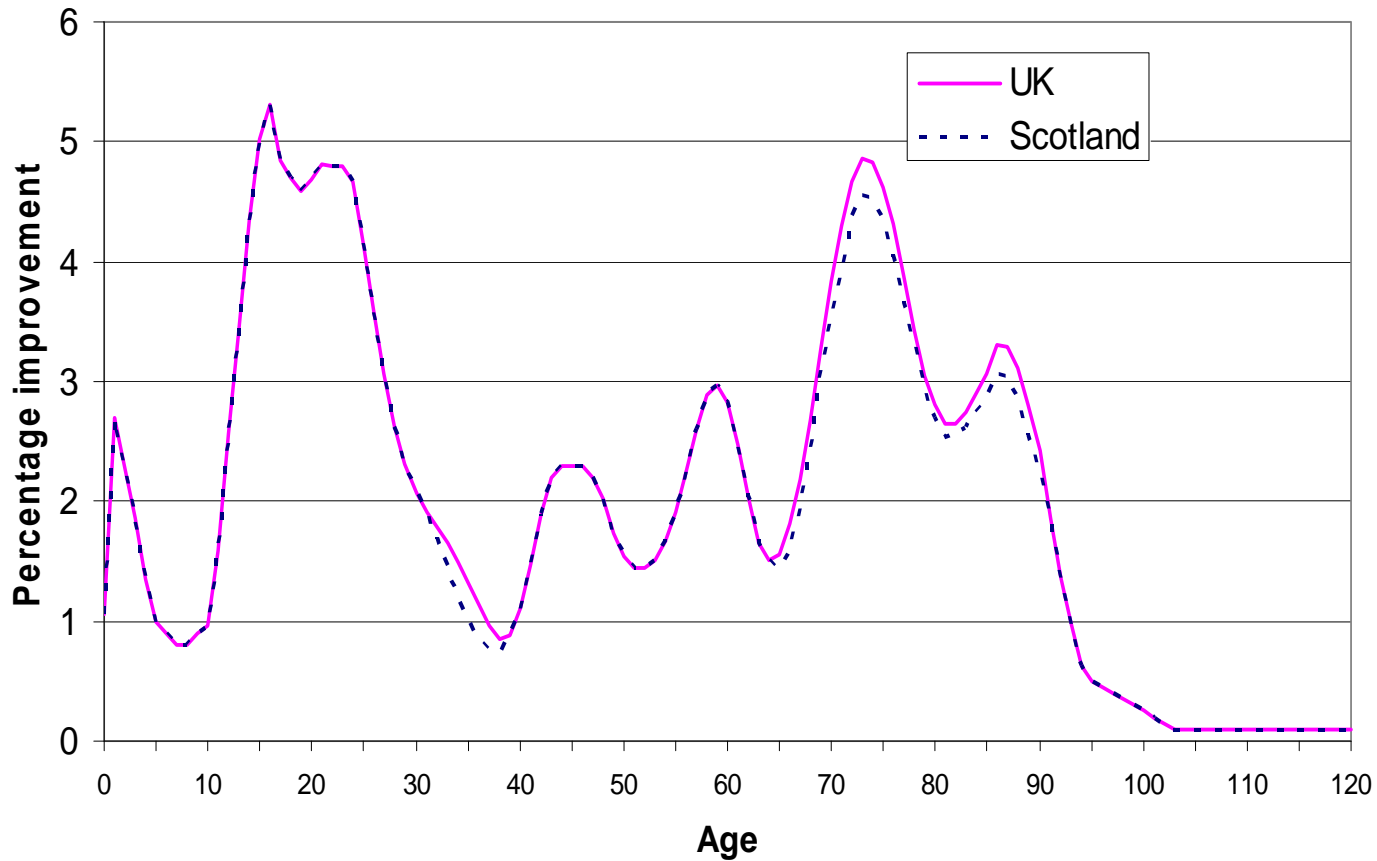
Scottish mx/UK mx, Females, (ratio of 5 year average mx values)



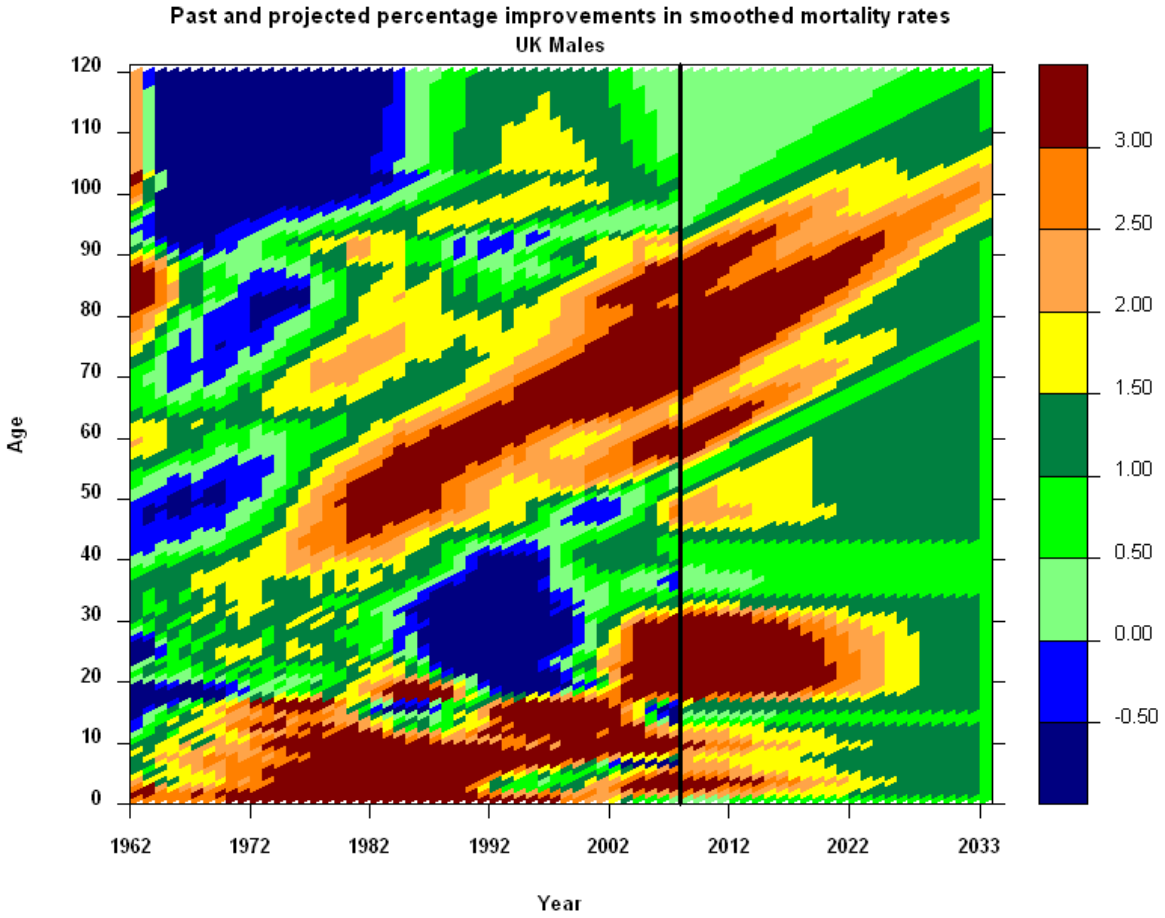
Comparison of UK and Scottish mortality improvements for base year of projections, Males



Comparison of UK and Scottish mortality improvements for base year of projections, Females



Annual improvement in smoothed mortality rates, males 1961/2 – 2032/3



Past and projected mortality improvements

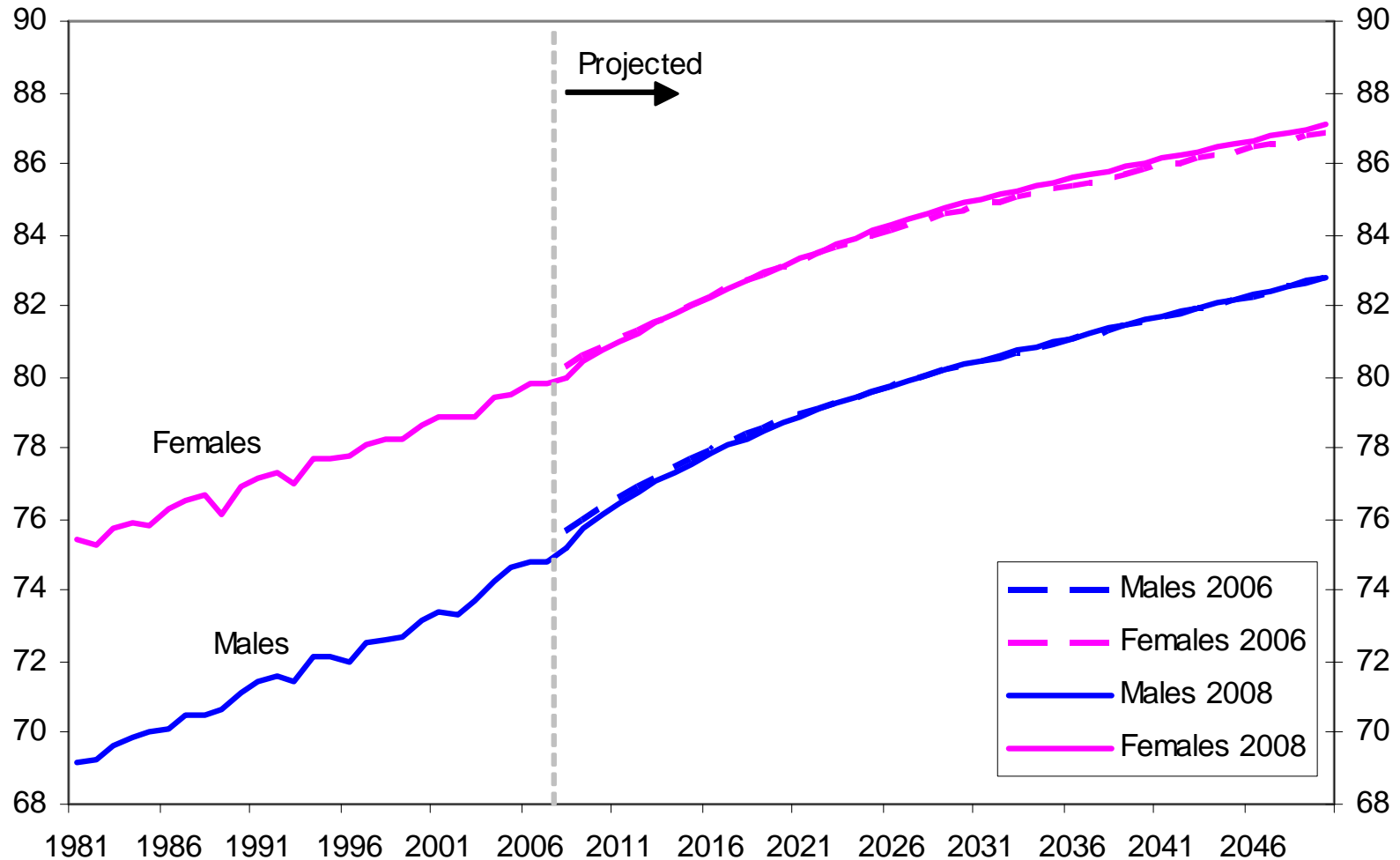
| Period ending in 2005-7 (years) | Annualised rate of improvement in aggregate age-standardised mortality rate for ages 0 to 99 | | | |
|------------------------------------|----------------------------------------------------------------------------------------------|-------|----------|-------|
| | Males | | Females | |
| | Scotland | E&W | Scotland | E&W |
| 25 | 1.87% | 2.16% | 1.32% | 1.49% |
| 45 | 1.34% | 1.57% | 1.30% | 1.35% |
| 75 | 1.07% | 1.25% | 1.20% | 1.28% |

| Period beginning in 2008 (years) | Annualised rate of improvement in aggregate age-standardised mortality rate for ages 0 to 99 | | | |
|-------------------------------------|----------------------------------------------------------------------------------------------|-------|----------|-------|
| | Males | | Females | |
| | Scotland | UK | Scotland | UK |
| 25 | 1.89% | 2.03% | 2.10% | 2.20% |
| 45 | 1.50% | 1.57% | 1.62% | 1.67% |
| 75 | 1.30% | 1.34% | 1.37% | 1.40% |

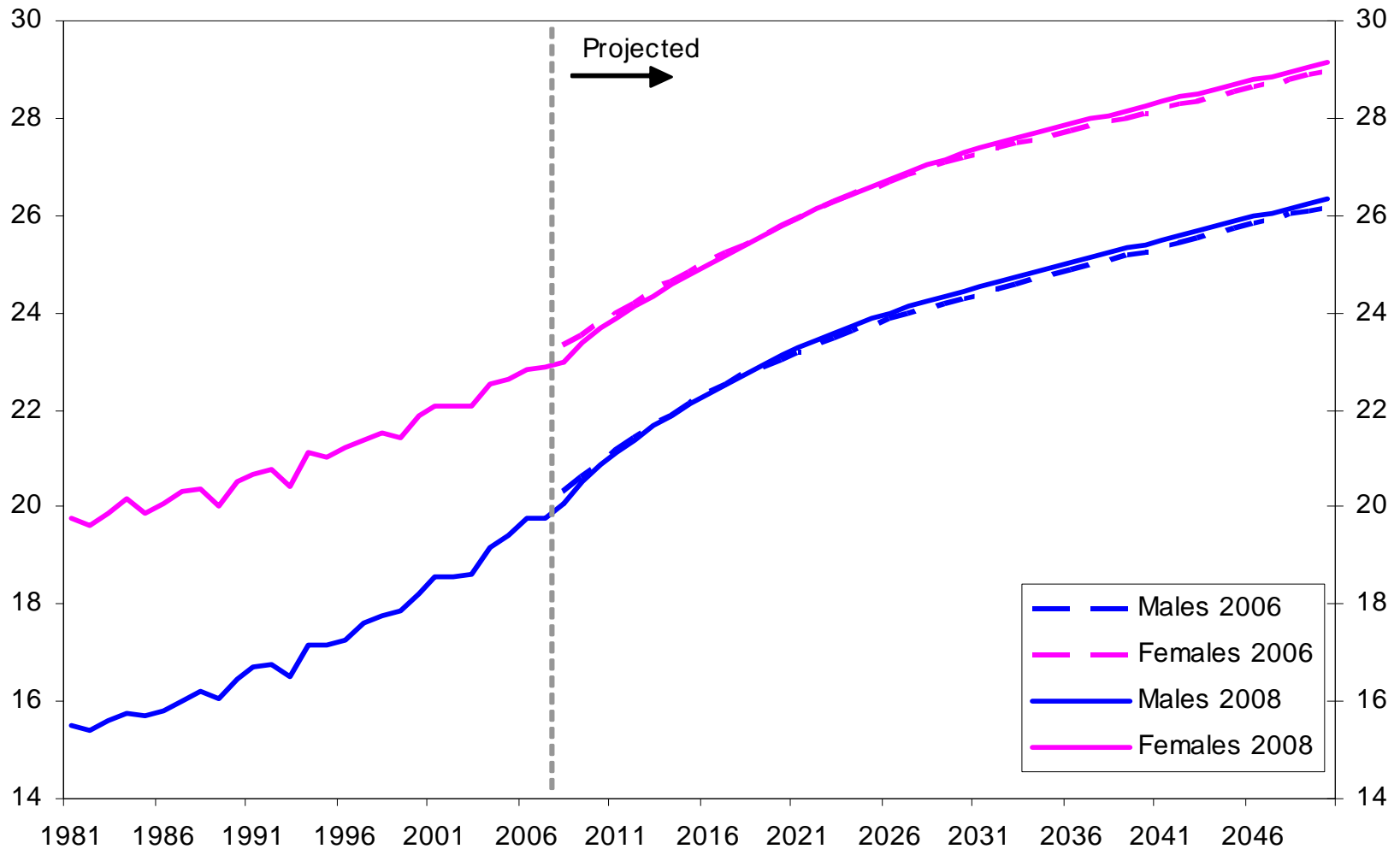
Period life expectancy - Scotland

| | 2008 | 2013 | 2023 | 2033 | 2083 |
|--------------------------------------|----------------|----------------|----------------|----------------|----------------|
| Expectation of life at birth | | | | | |
| Males | 75.2 (75.7) | 77.1 (77.2) | 79.3 (79.3) | 80.7 (80.7) | 86.7 (86.7) |
| Females | 80.0 (80.3) | 81.5 (81.6) | 83.7 (83.7) | 85.3 (85.1) | 90.5 (90.3) |
| Expectation of life at age 65 | | | | | |
| Males | 16.3 (16.6) | 17.8 (17.9) | 19.7 (19.7) | 20.8 (20.7) | 25.3 (25.2) |
| Females | 18.9 (19.3) | 20.2 (20.3) | 22.1 (22.1) | 23.4 (23.3) | 27.6 (27.5) |

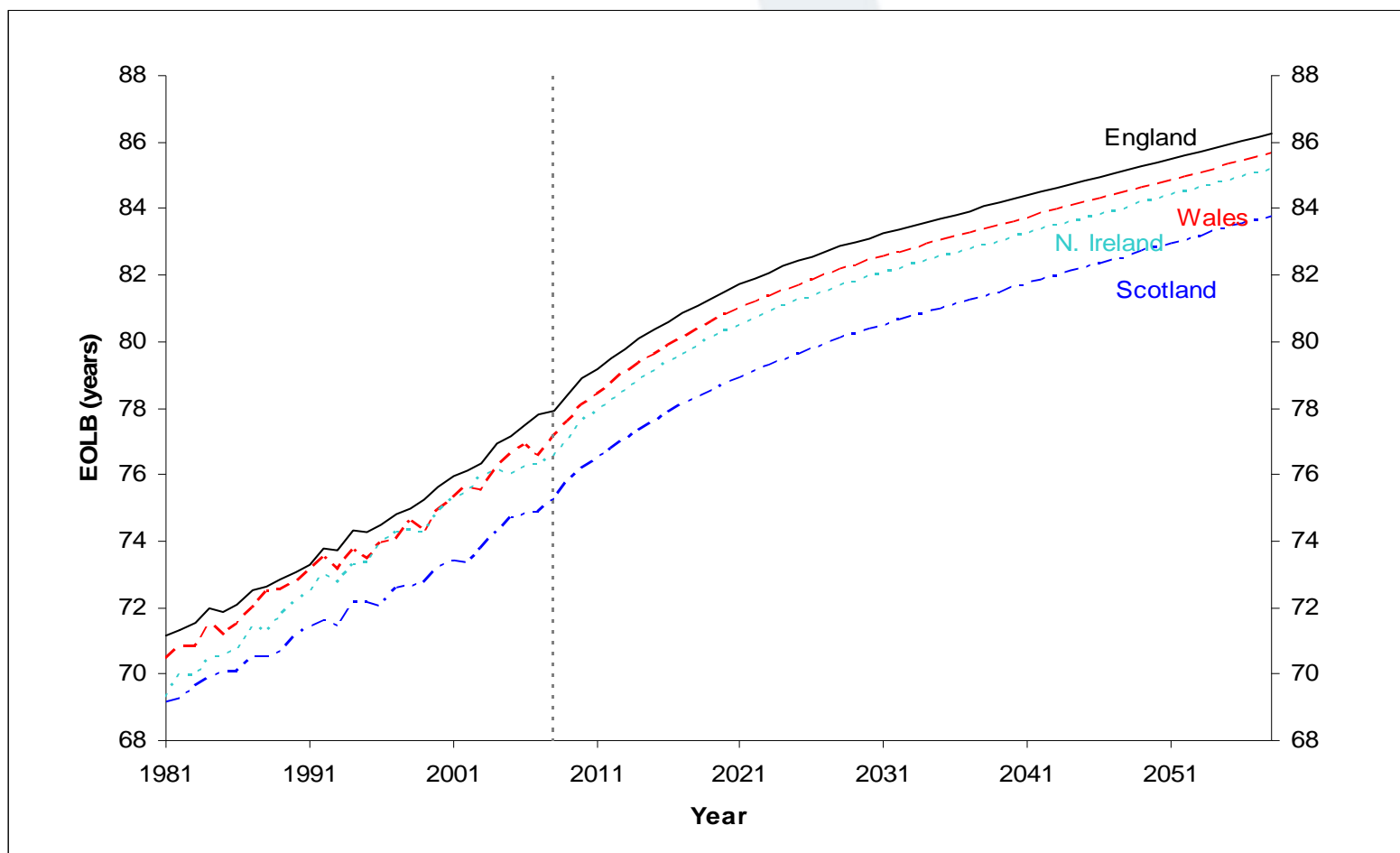
Period expectation of life at birth, Scotland, principal projections



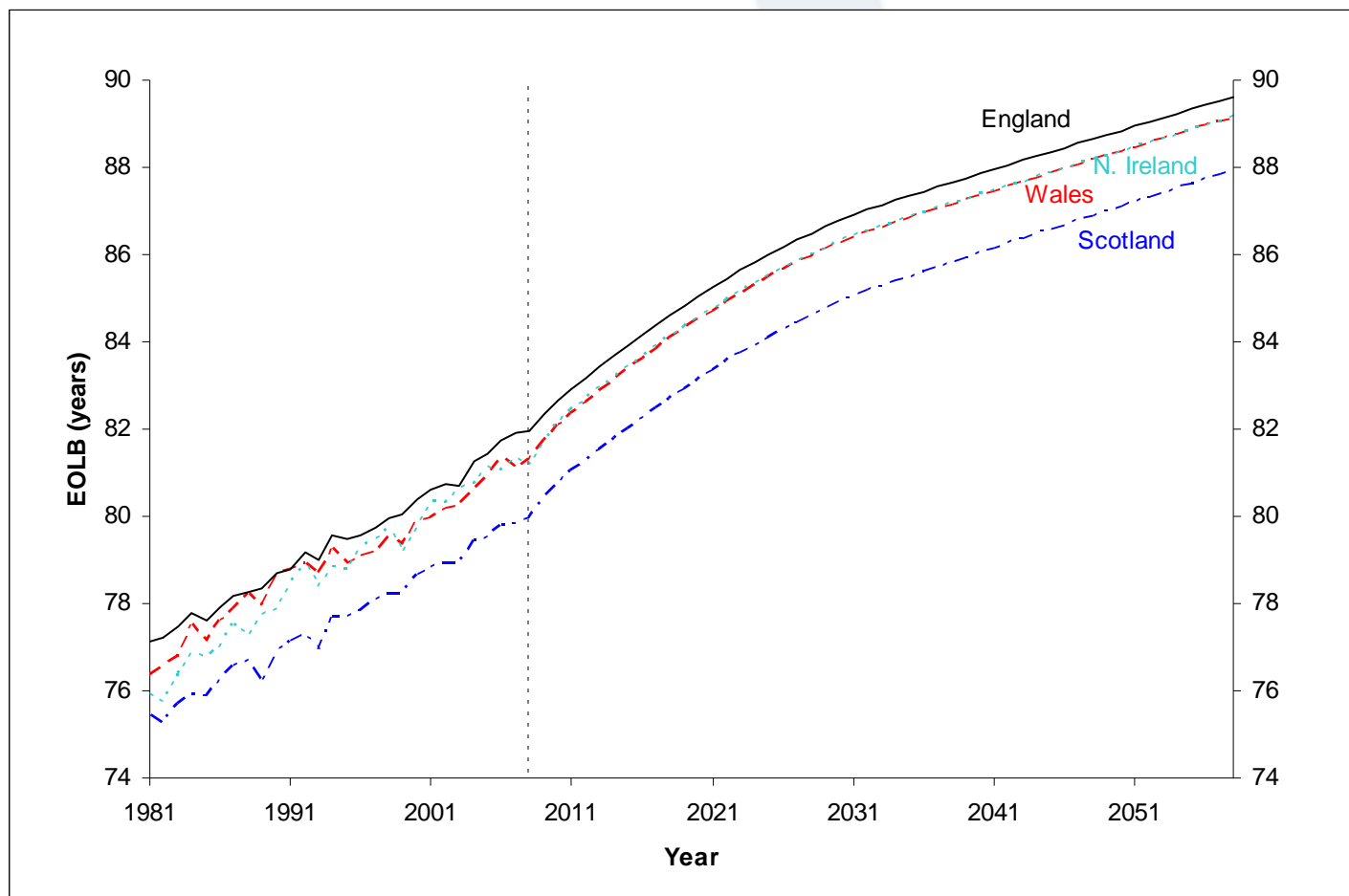
Period expectation of life at 60, Scotland, principal projections



Actual and projected period life expectancy at birth, males, 1981-2058



Actual and projected period life expectancy at birth, females, 1981-2058



Period expectations of life at birth for selected countries

| Country | Males | Females |
|------------------------|-------------|-------------|
| Scotland | 75.2 | 80.0 |
| UK | 77.6 | 81.7 |
| The Netherlands (2006) | 77.6 | 81.9 |
| Sweden | 78.9 | 83.0 |
| Denmark | 76.0 | 80.5 |
| France | 77.5 | 84.4 |
| Switzerland | 79.4 | 84.2 |
| Canada (2005) | 78.0 | 82.7 |
| USA (2005) | 75.2 | 80.4 |
| Australia (2006) | 80.3 | 84.0 |
| Japan | 79.2 | 86.0 |

Projected period expectations of life at birth in 2050

| Country | Males | Females |
|--------------------|-------|---------|
| Scotland | 82.8 | 87.1 |
| UK | 85.1 | 88.6 |
| Sweden | 83.6 | 86.3 |
| Norway | 84.7 | 88.9 |
| France | 83.8 | 89.0 |
| Switzerland | 85.0 | 89.5 |
| The Netherlands | 81.5 | 84.2 |
| Canada (2056) | 85.0 | 88.6 |
| Japan | 81.0 | 89.2 |
| Australia (medium) | 84.9 | 88.0 |
| USA | 81.2 | 86.7 |

Source: latest published projections from country's national statistics website March 2009