



# The retreat of mortality – 20<sup>th</sup> and 21<sup>st</sup> century trends

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# The retreat of mortality

**Trends in overall mortality risks:** the modern pattern, differences between the sexes, questions of measurement; expectation of life, international comparisons.

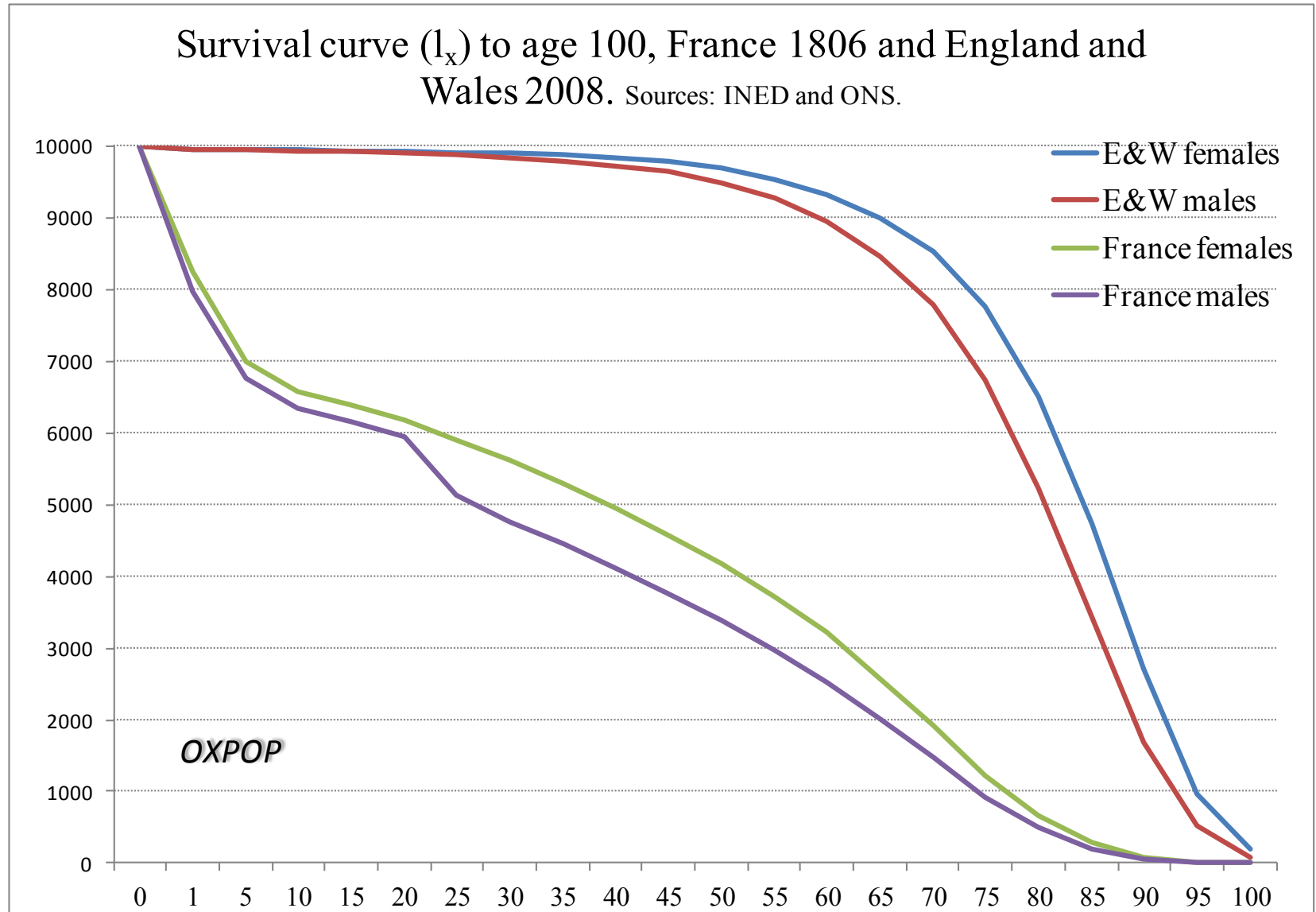
**Components of mortality decline:** causes of death; the decline of infectious disease. Diseases of “affluence”?

**Explaining mortality:** patterns and divergence.

**Prospects for longer life.**

200 years of improved survival: survivors from birth to given ages per

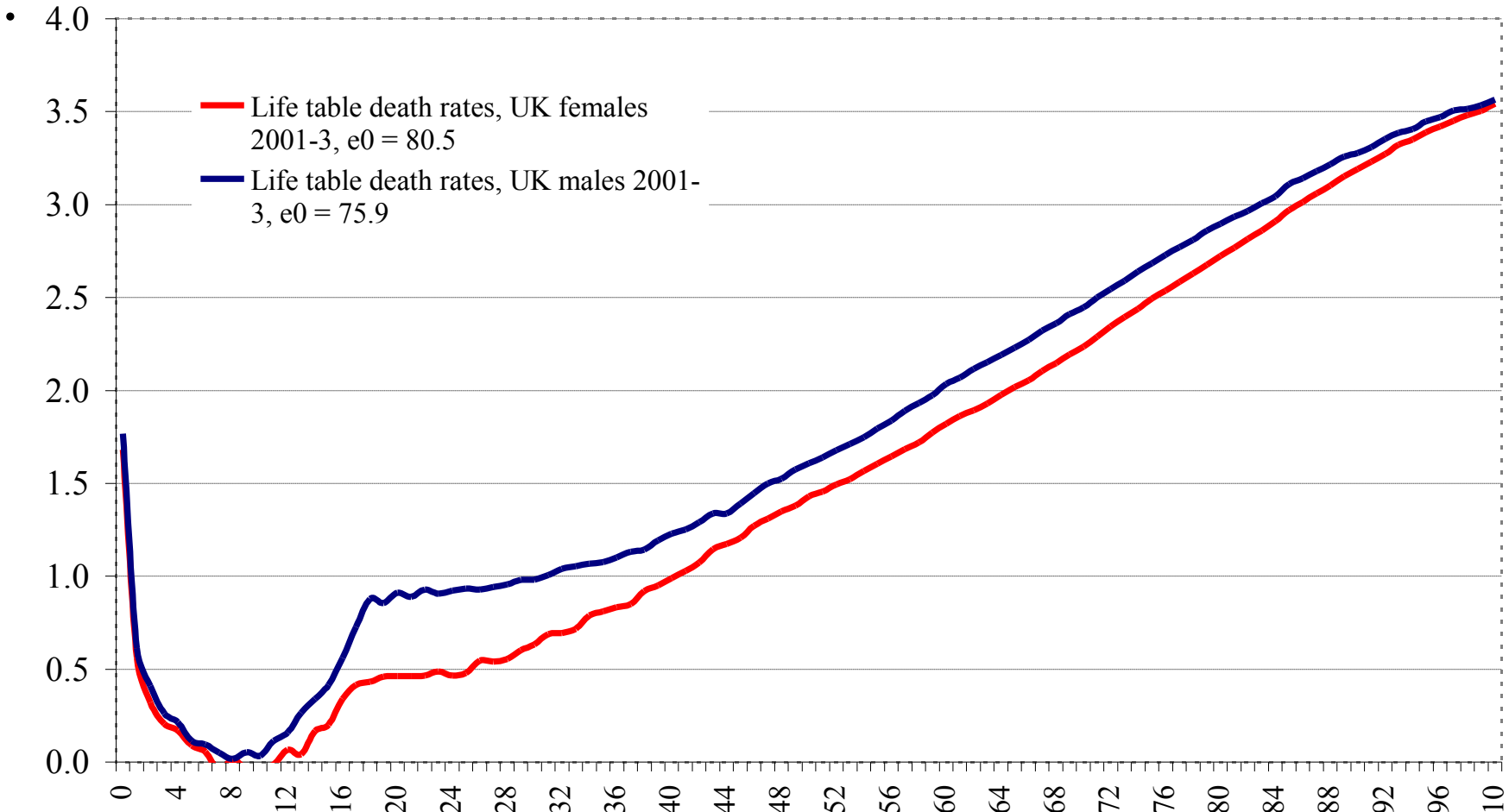
10,000 births, France 1806 and England and Wales 2008. Sources: INED, ONS.



# English life-table, male and female $\log_{10} q_x$ 2001-3.

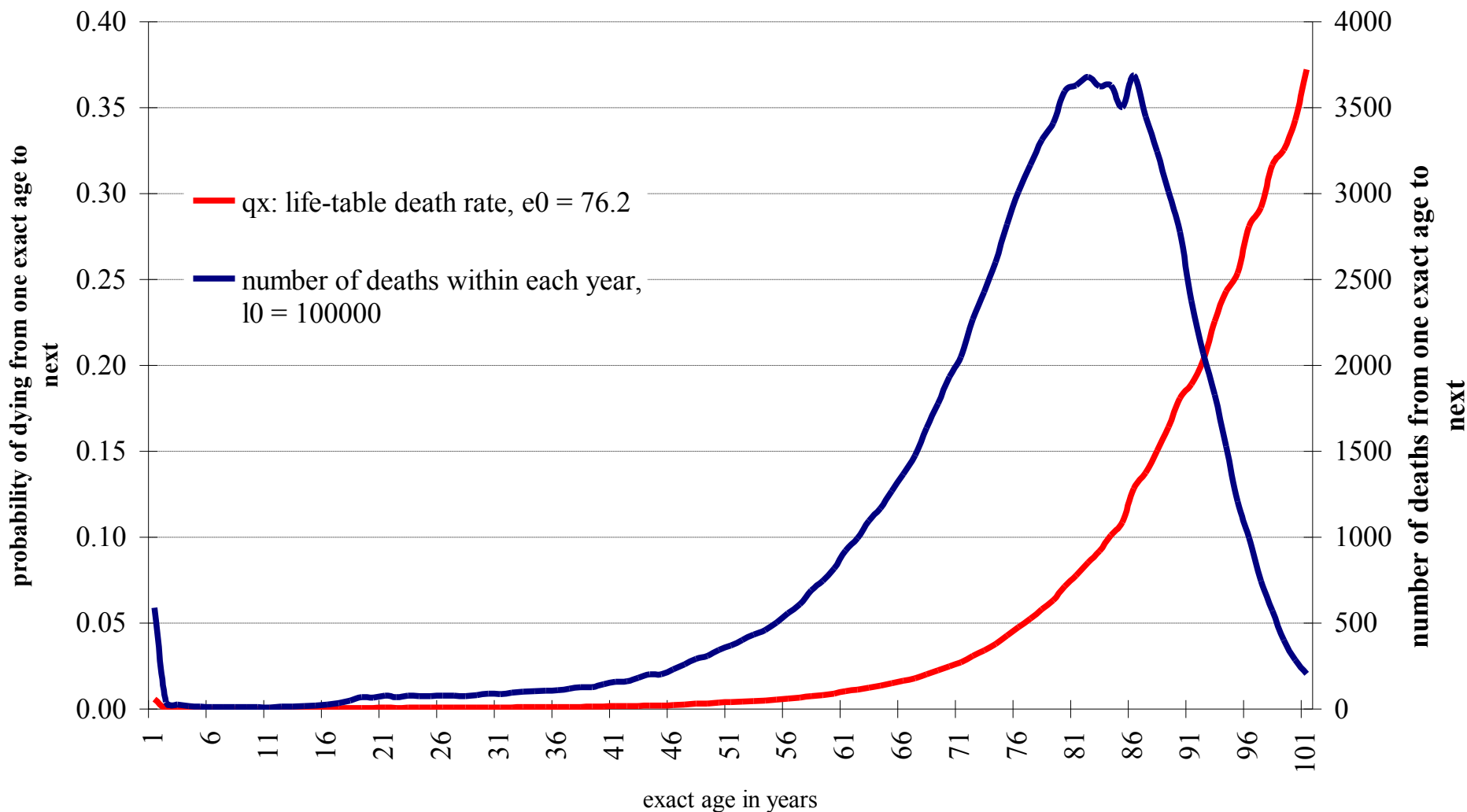
Source: ONS.

UK interim life table 2001-3, male and females,  $\log_{10} * 10000 q_x$

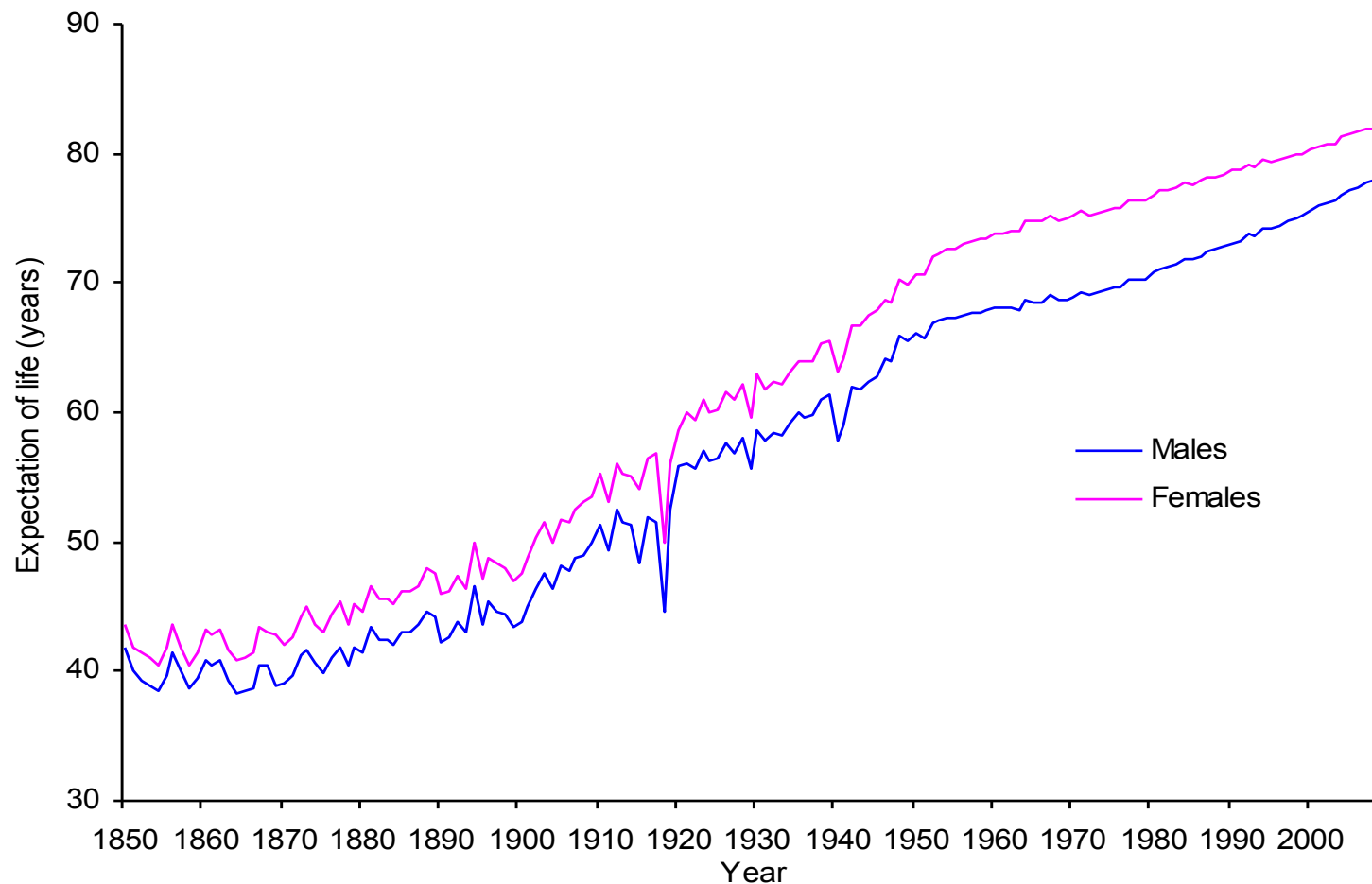


# English life-table 2001-3, $q_x$ and $d_x$ . Source: ONS.

Interim English Life-Table, males, 2001-3.  $q_x$  and  $d_x$ . source: GAD.

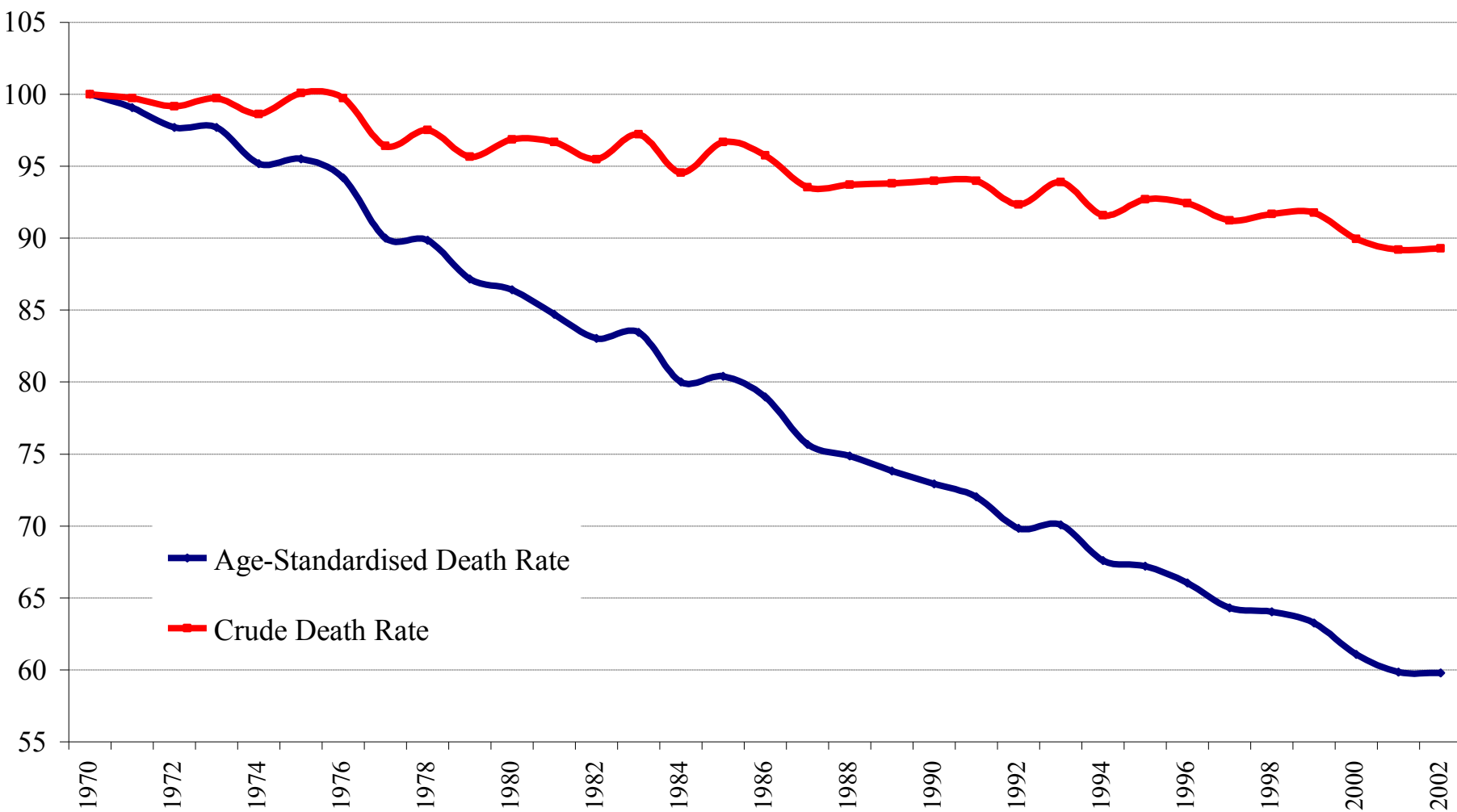


# Period expectation of life at birth, England and Wales, 1850 – 2010. Source: ONS

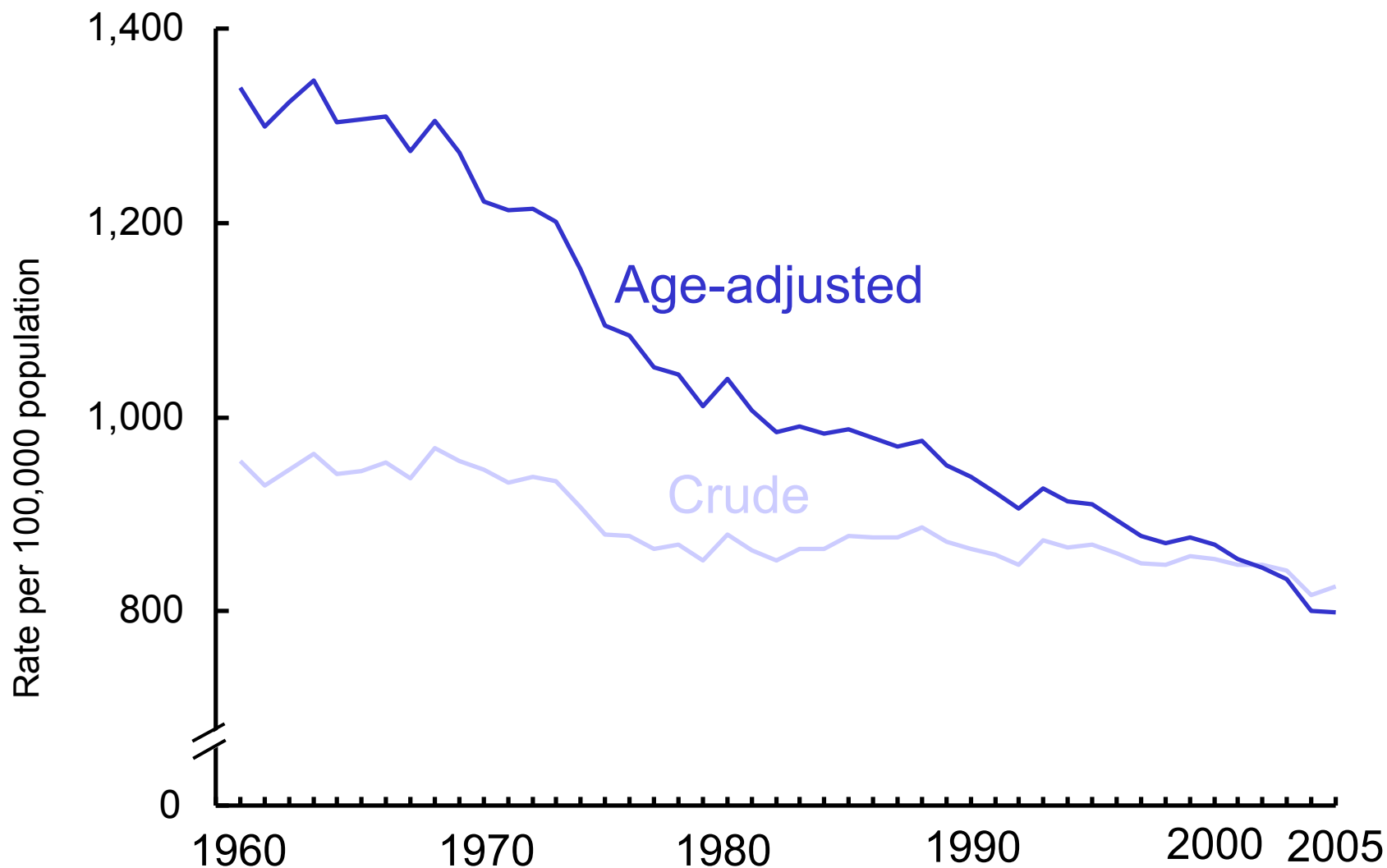


# Trend in Crude and Age-Standardised Death Rate, EU15 1970 - 2002, 1970 = 100.

Source WHO Health for All database 2005.



## Crude and age-adjusted death rates: United States, 1960-2005

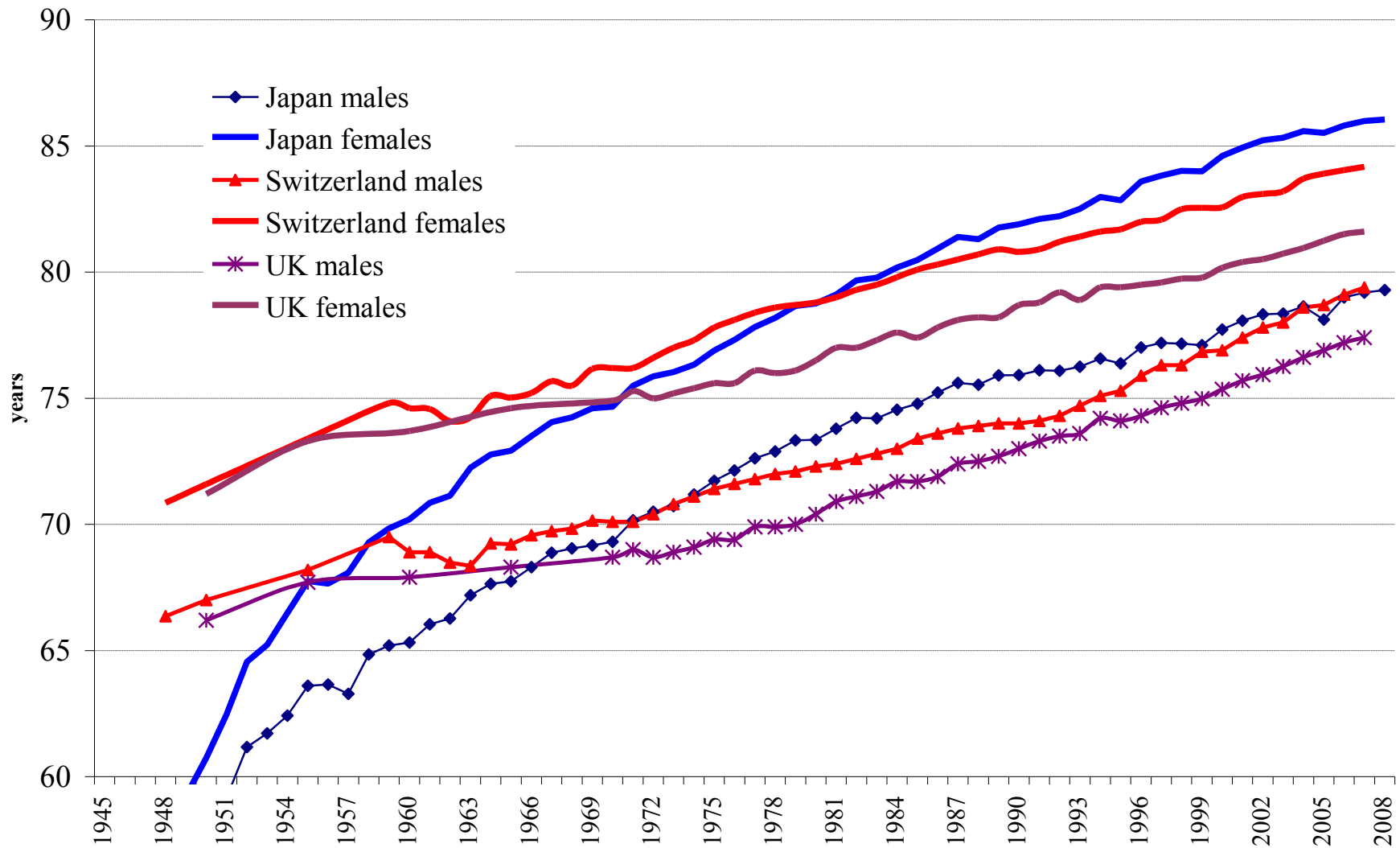


NOTE: Crude death rates on an annual basis per 100,000 population; age-adjusted rates per 100,000 U.S. standard population; see "Technical Notes."



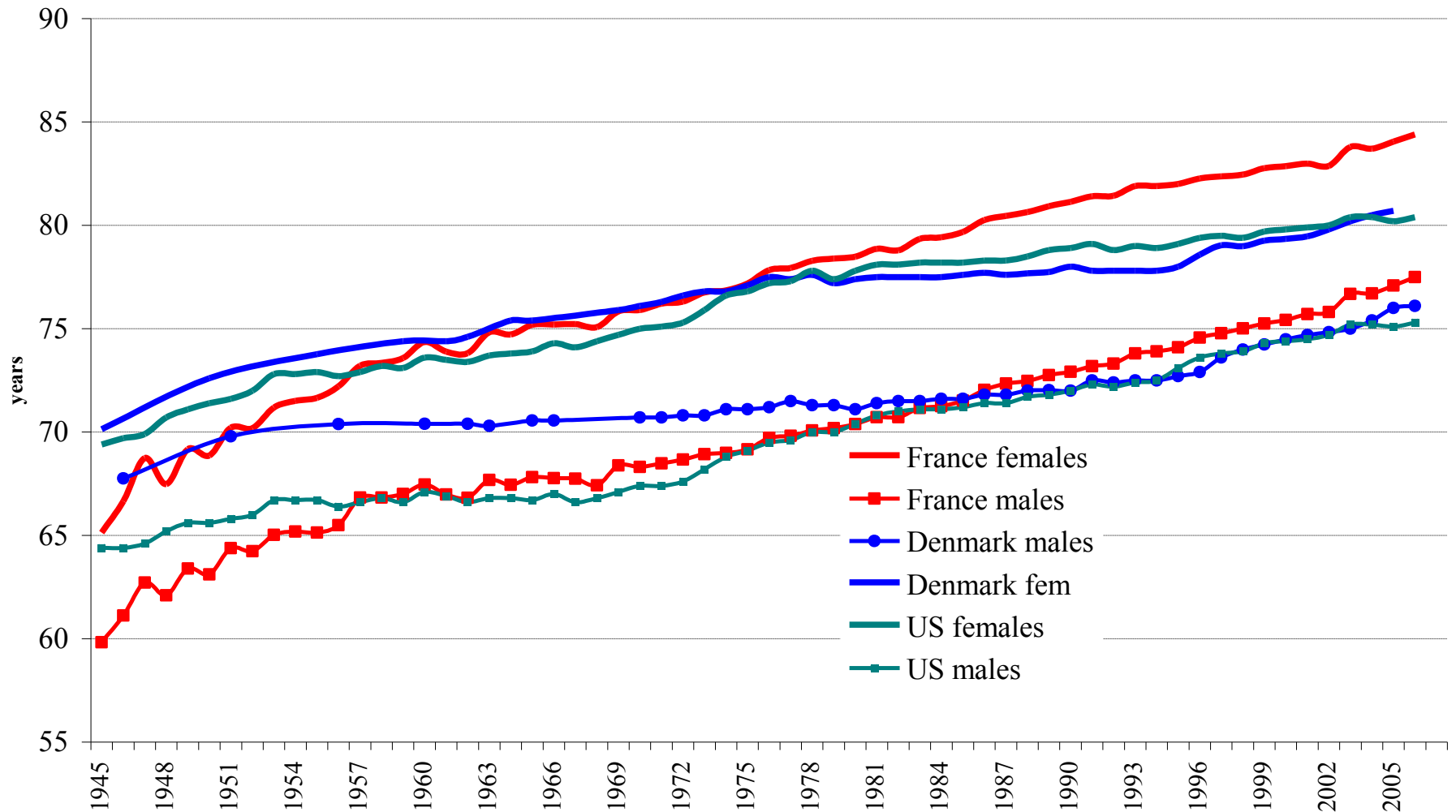
# Two high survival achievers: Japan and Switzerland 1948 – 2008 (with UK for comparison).

Expectation of life at birth, males and females, selected countries



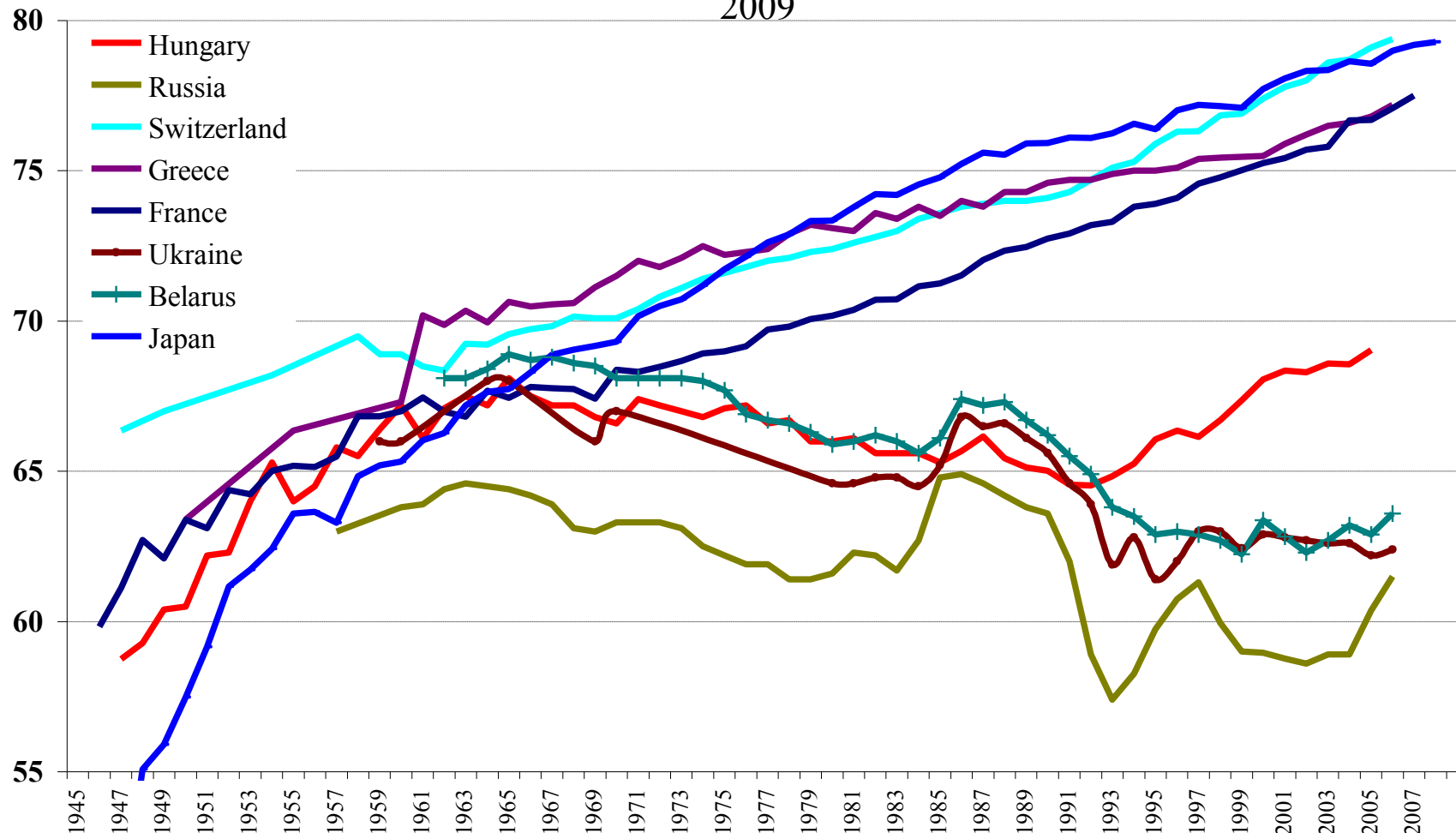
# Expectation of life at birth, France, Denmark, USA, to show divergence of female $e_0$ .

Expectation of life at birth, males and females, USA, Denmark, France



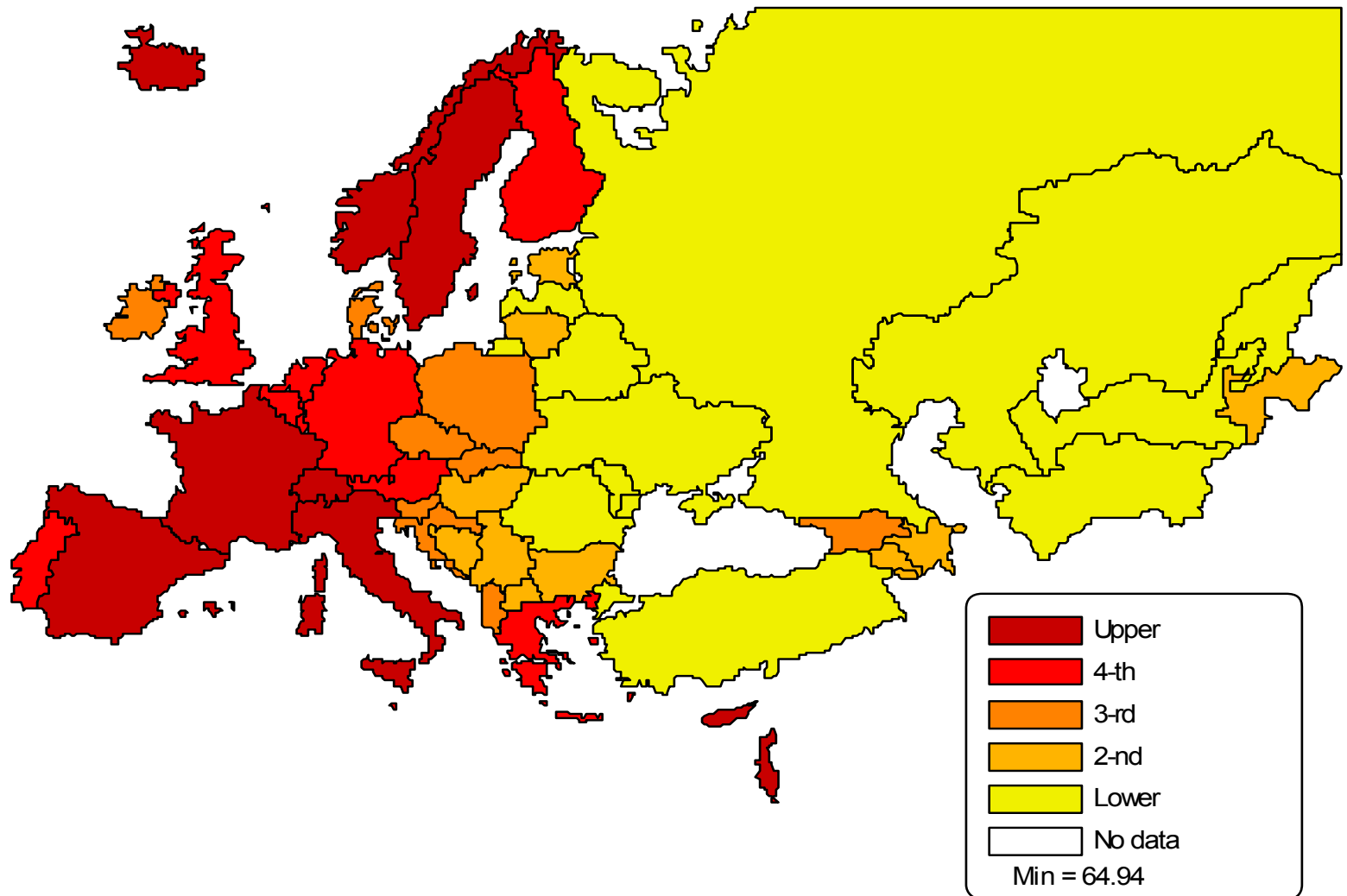
# Male expectation of life at birth, diverse trends 1950-2007. Source: Eurostat and national statistical institutes.

Expectation of life at birth, males, selected European countries and Japan 1945 -  
2009

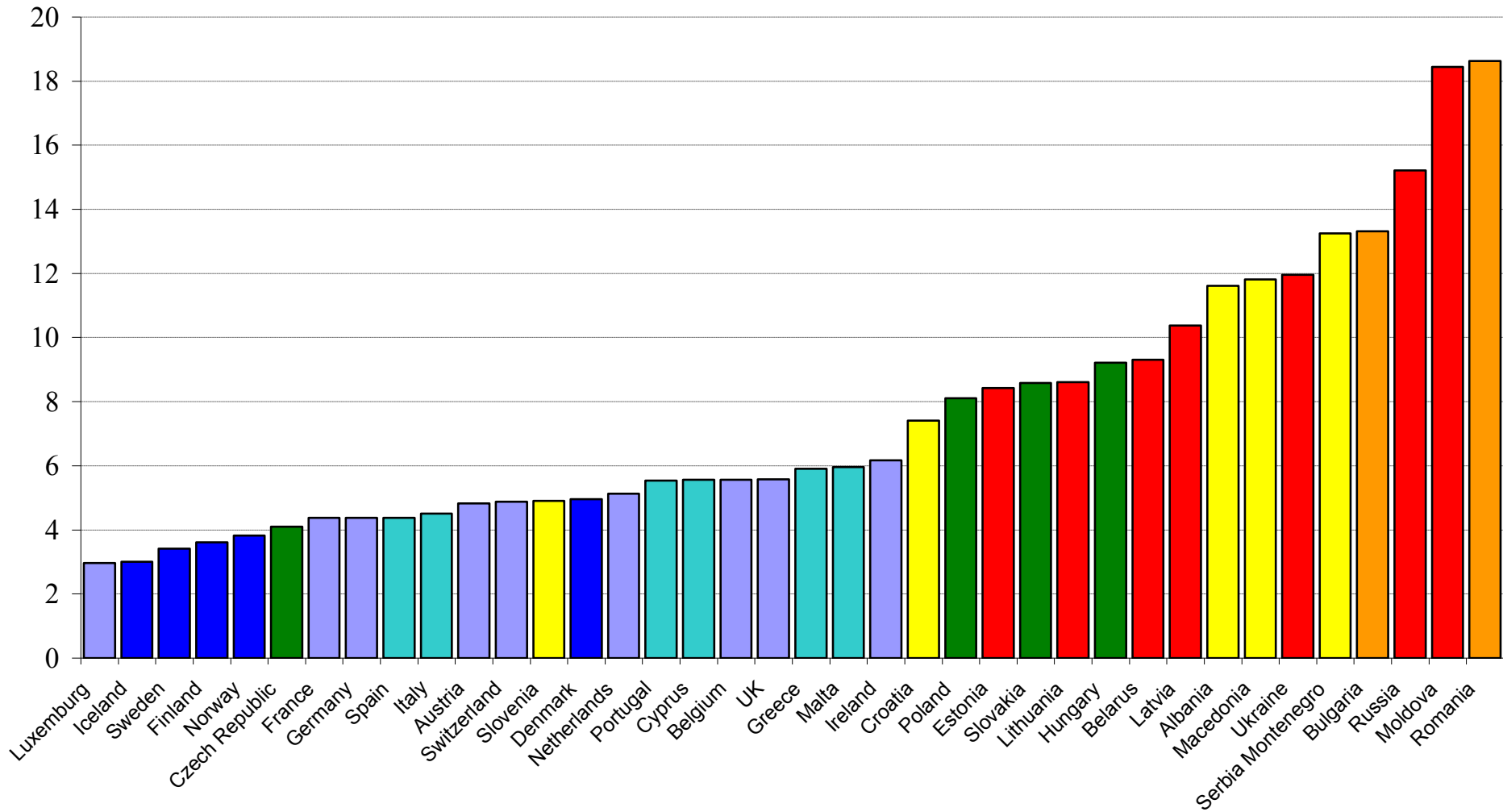


# Expectation of life at birth, both sexes, about 2005 (quintiles)

source: WHO

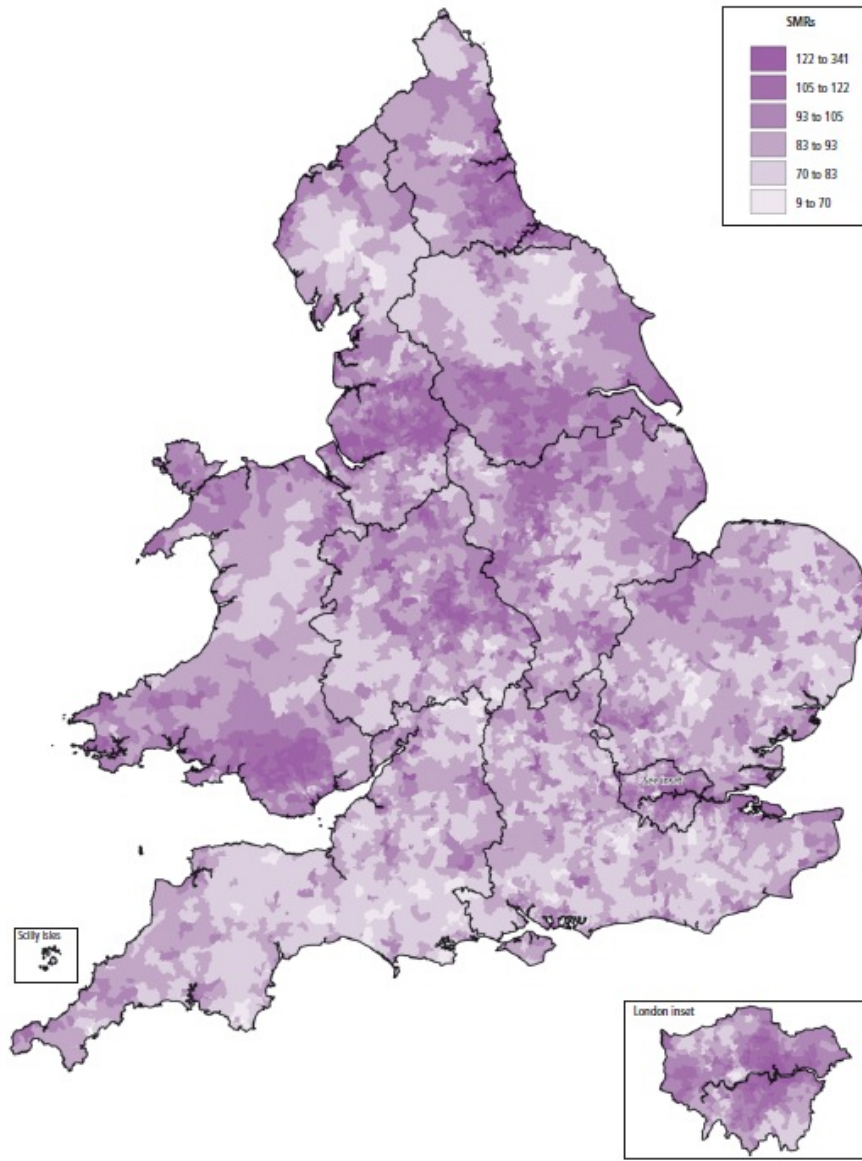


**Infant Mortality Rate, Europe 2002.** Source: WHO Health for All database



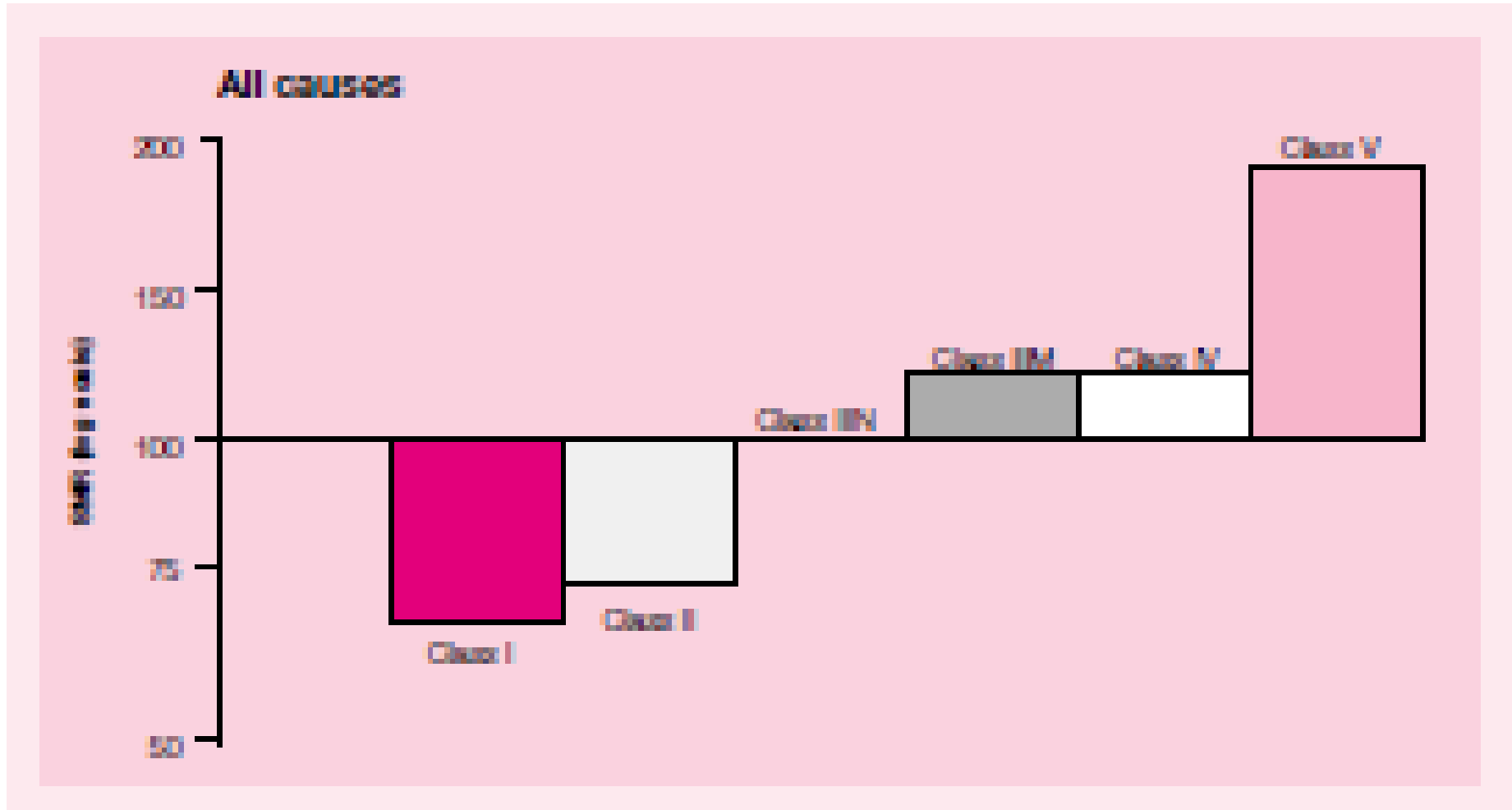
# Persistent diversity within a population. England, SMR by ward 1999-2003, spatially and temporally smoothed.

Source: Health Statistics Quarterly 40 2008 Mar 3



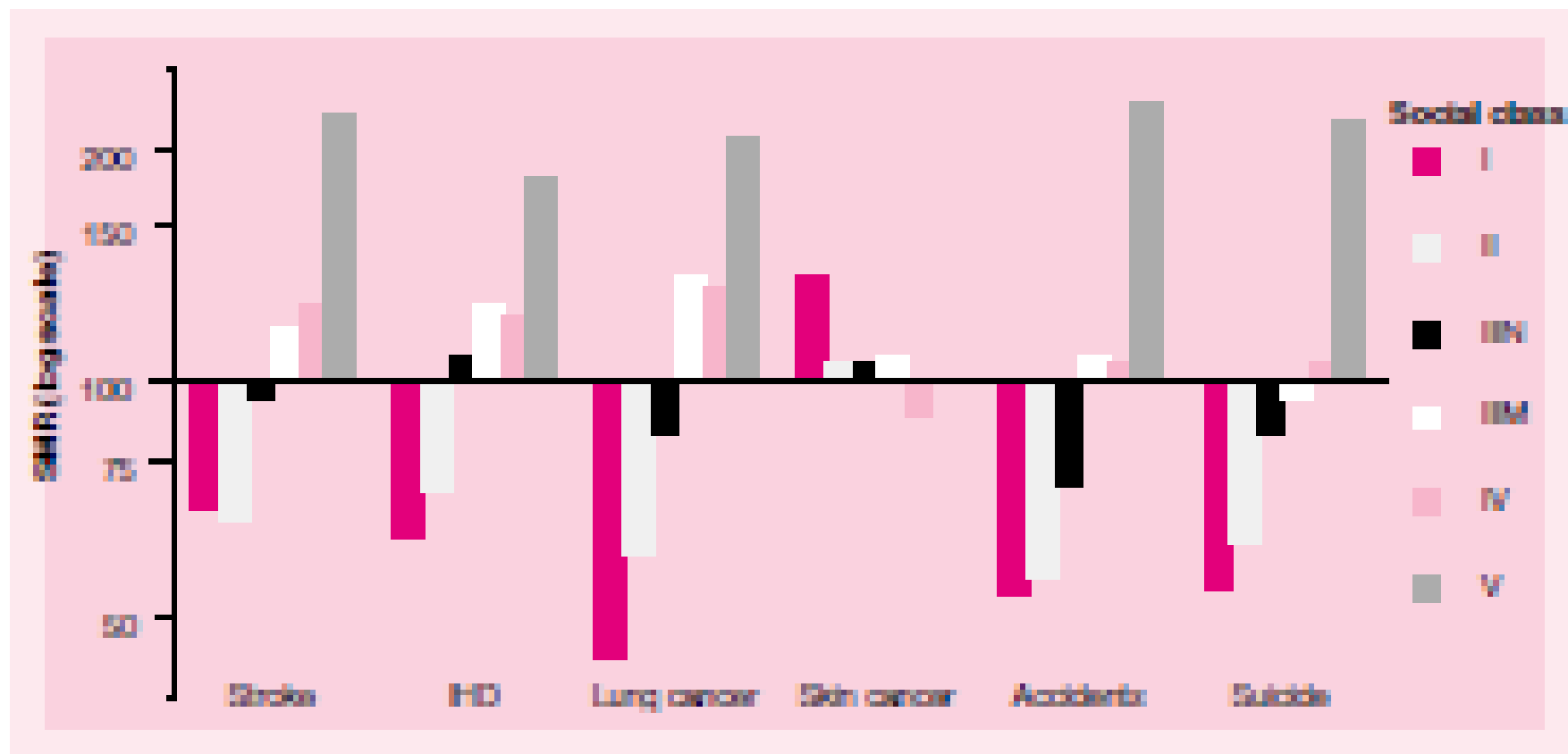
# Diversity within a population. England and Wales, SMRs by Social Class, all causes, men aged 20-64.

Source: DS 15.



# Persistent diversity within a population. England and Wales 1991-93, SMRs for men aged 20-64 by social class, selected

**causes.** Source: Health Inequalities Decennial Supplement, DS 15.





Signature \_\_\_\_\_ date \_\_\_\_\_ 197\_\_\_\_

Name in BLOCK CAPITALS \_\_\_\_\_

Registered medical qualifications \_\_\_\_\_

Address \_\_\_\_\_

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# Death certificates get brighter look

By ALEXANDRA FREAN, SOCIAL AFFAIRS CORRESPONDENT

AN IMPROVED — and decidedly more cheerful — design for English and Welsh birth and death certificates has been produced by the Office for National Statistics.

Out go the sombre grey/black background of death certificates and the rose tint of birth certificates. Replacing them will be a pastel blue background with a central design incorporating the rose and daffodil emblems of England and Wales.

Register offices will begin to issue the certificates from late spring onwards, but those issued centrally by the Office for National Statistics — usually to replace a lost document — will be in the new design only after existing stocks have been used up.

There have been minor changes to certificates in recent years, but the new look is the first major design since existing background tints were introduced 50 years ago.

The changes will be phased

in so that all birth, death and still-birth certificates issued from January 1, 2000, will be in the new design.

About four million certificates are issued each year, including those for such purposes as the study of genealogy and passport applications.

A government spokesman last night denied that the change was a New Labour ploy to put a more positive spin on even the darkest of occasions such as death.

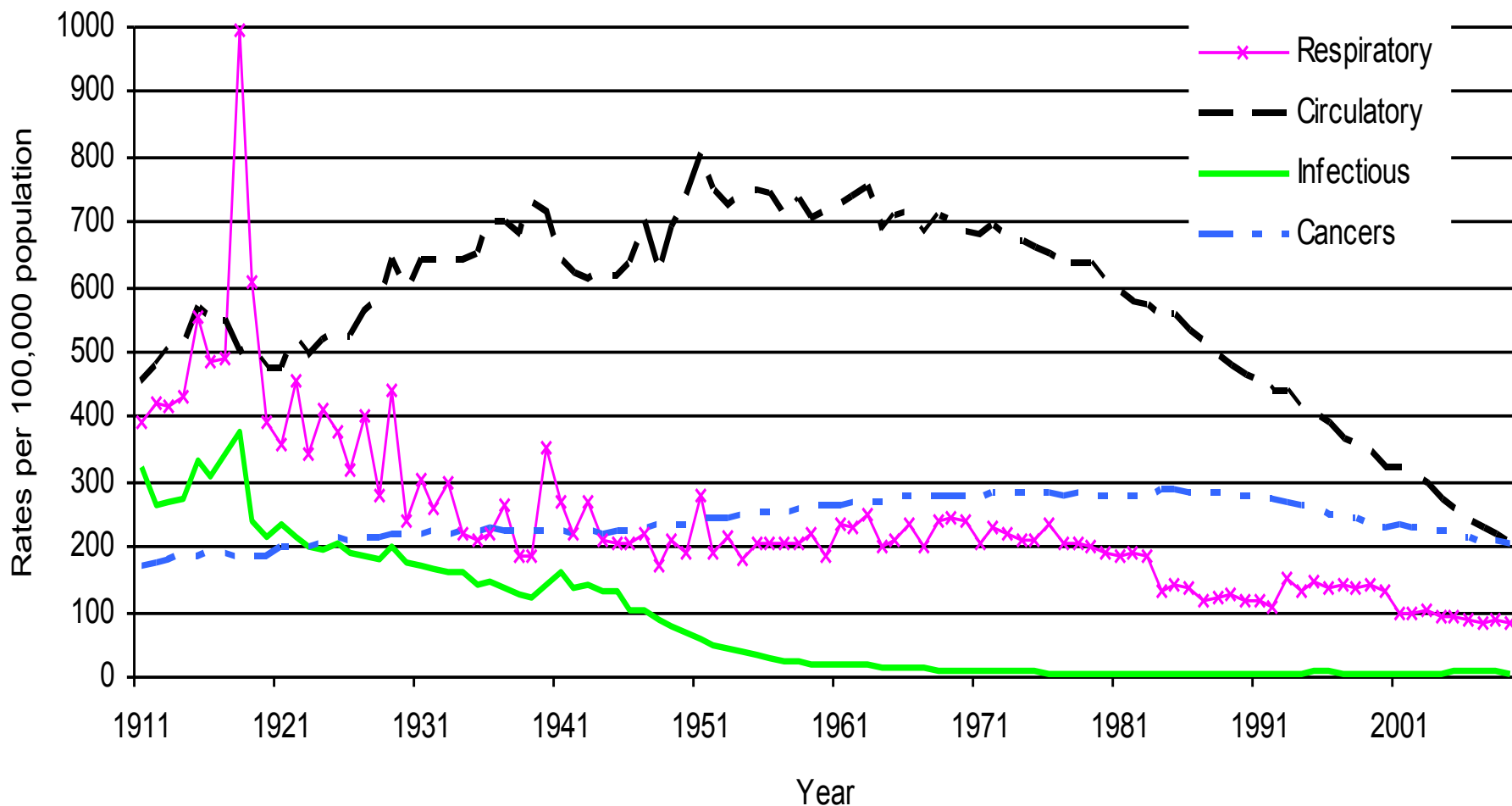
"Actually, the Stationery Office started thinking about these changes in early 1997 under the last Government. It's just that it has taken rather a long time to sort it all out," he said.

He added that secret design elements would also make the certificates — which will now be issued in a standard A4 size — harder for would-be forgers to counterfeit.

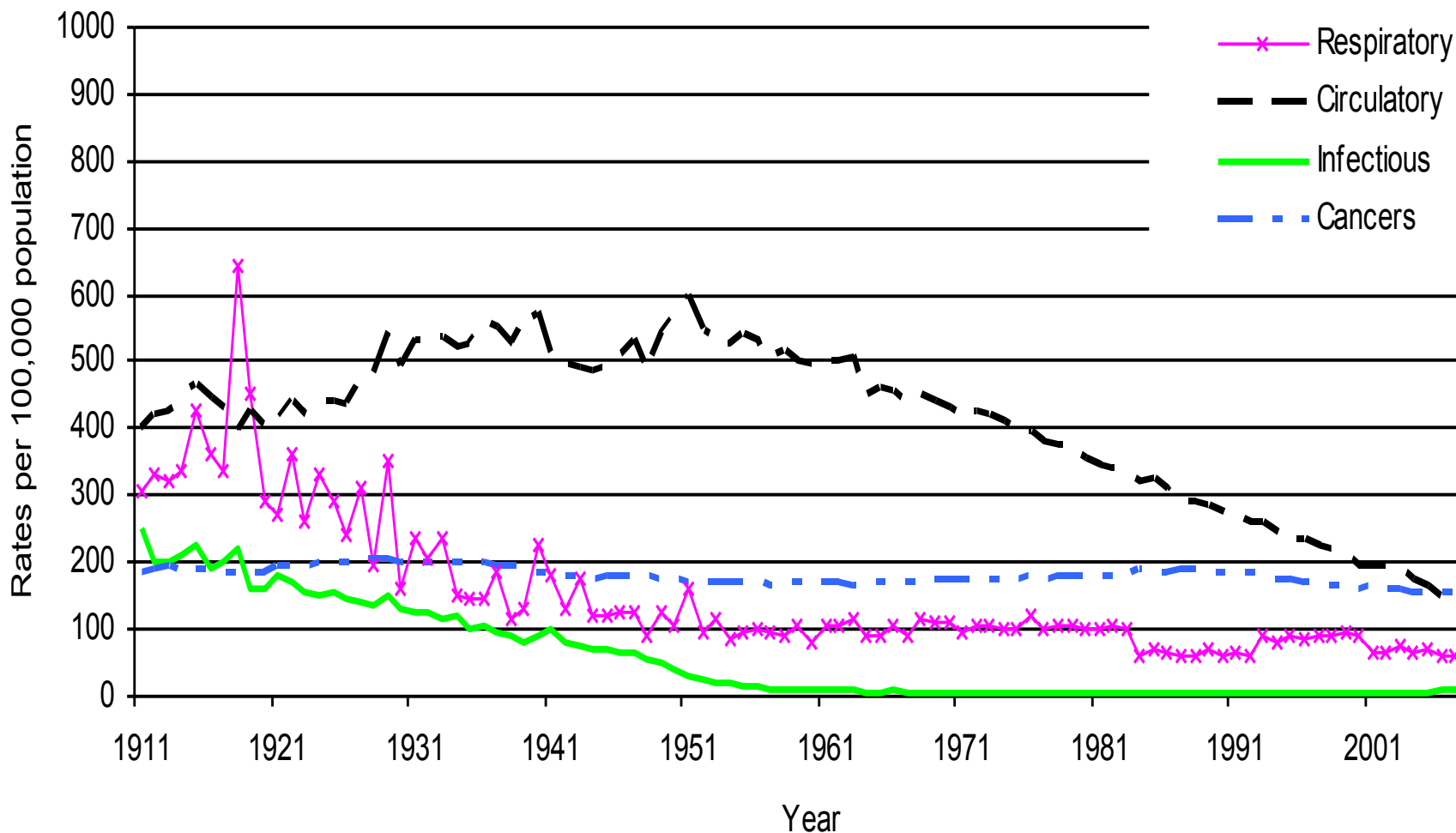
The new certificates have been given a trial run in Bolton, Lancashire.

Times Friday Feb 19 1999

Male mortality by major cause, E&W 1917-2009.  
Age standardised mortality rates for selected broad disease  
groups. Source: Adrian Gallop, ONS



Female mortality by major cause, E&W 1917-2009.  
Age standardised mortality rates for selected broad disease  
groups. Source; Adrian Gallop, ONS.



# US 1958 – 2005; age –standardised mortality per 100,000 by leading causes of death. n.b. log scale.

Source: NCHS National Vital Statistics Reports 56. 10 n. 8.

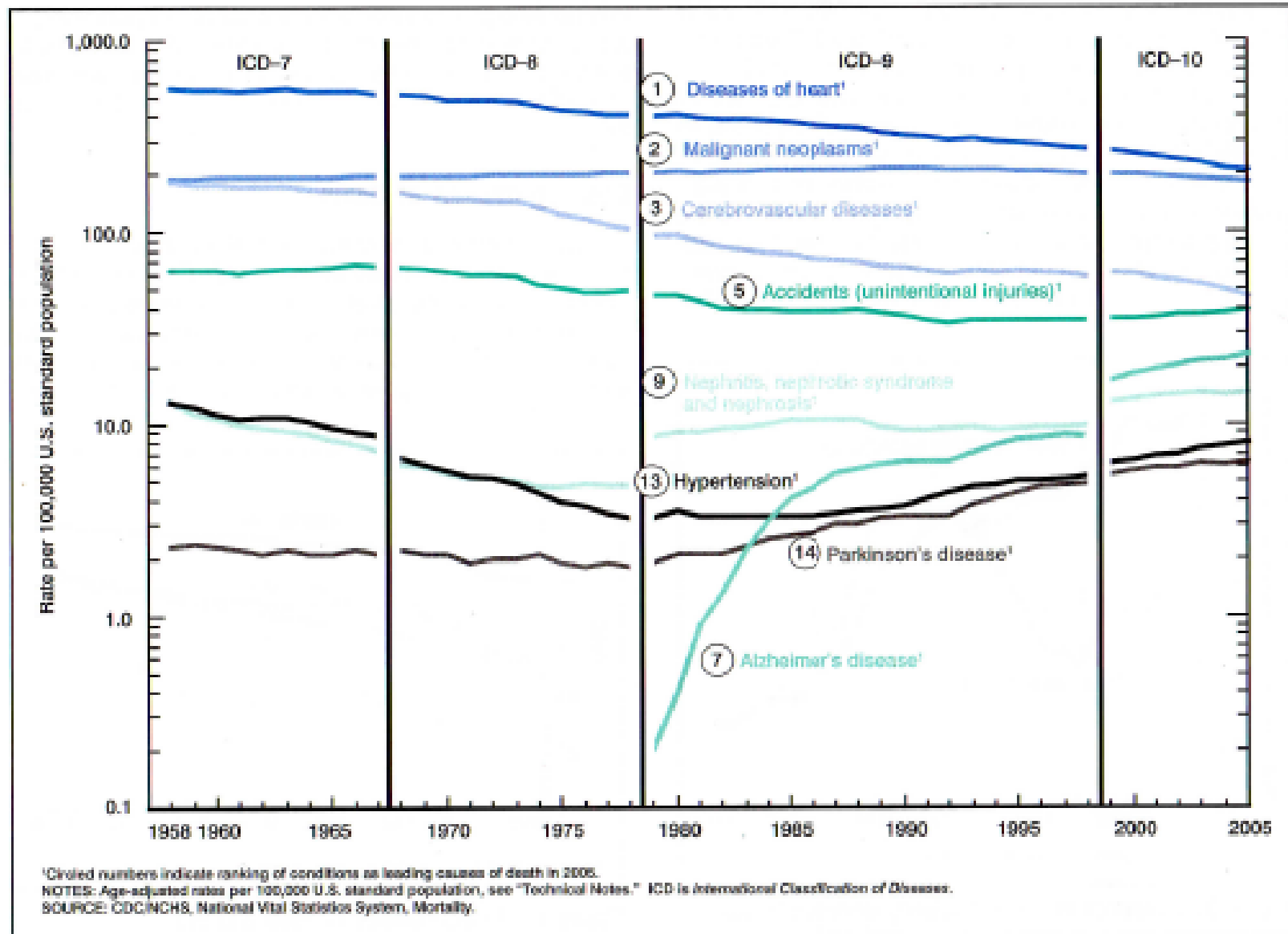
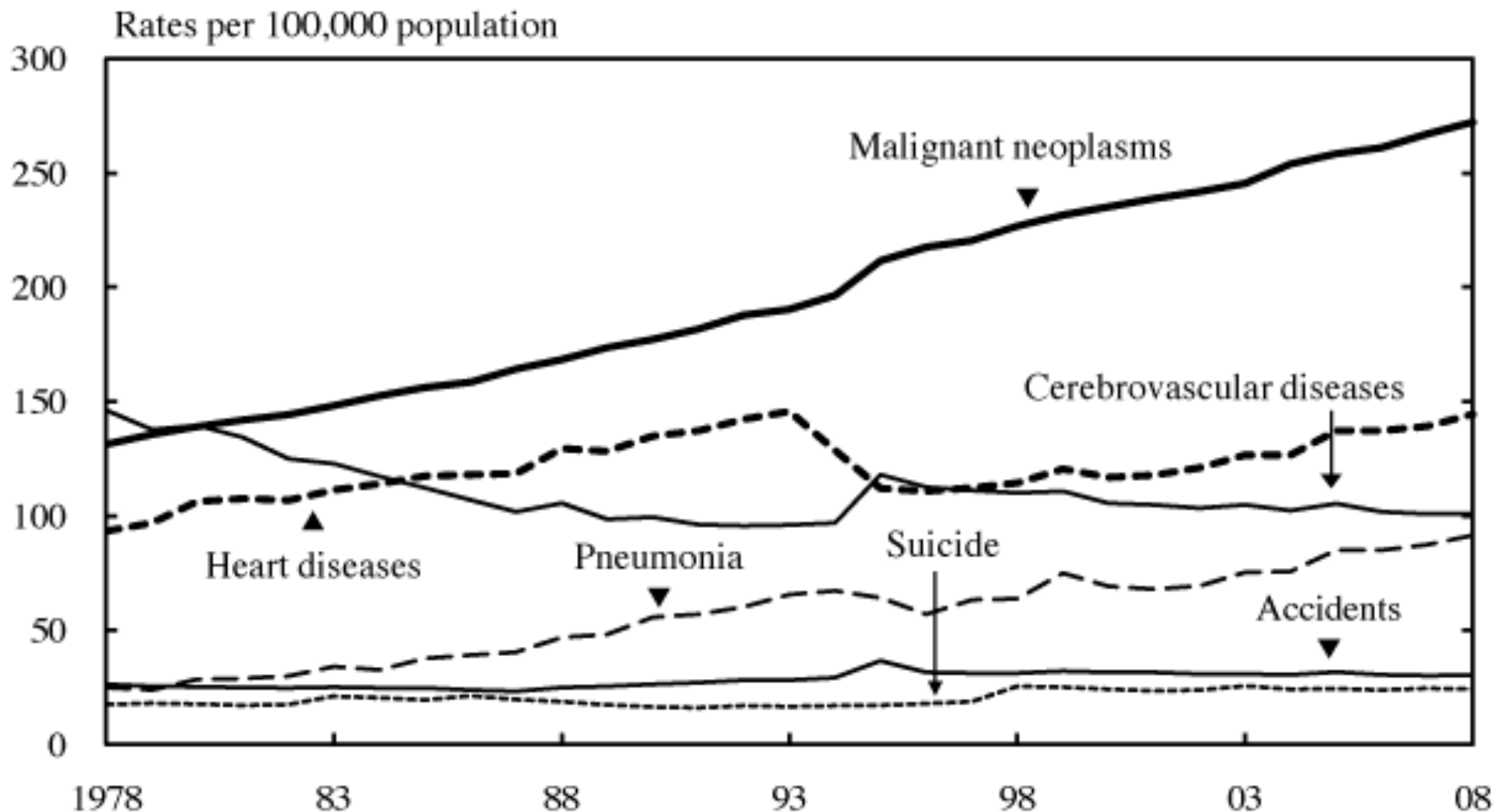


Figure 5. Age-adjusted death rates for selected leading causes of death: United States, 1958–2005

# Japan – major causes of death 1978 - 2008

**Figure 15.3**  
**Death Rates by Major Cause**



Source: Ministry of Health, Labour and Welfare.

# Circulatory disease, selected European countries 2001.

Forms of Circulatory Disease, Selected European Countries 2001.			
	Standardised Death Rate .		
	IHD	CVD	PAD
France	49	39	55
Spain	63	54	51
Italy	71	59	59
Greece	85	105	98
Sweden	121	56	44
Germany	123	56	71
Poland	133	103	100
UK	134	67	28
Romania	228	215	72
Russia	379	303	54
Ukraine	499	190	26
<b>Europe</b>	<b>216</b>	<b>137</b>	<b>60</b>

IHD: Ischaemic Heart Disease. CVD: Cerebrovascular Disease.

PAD: Pulmonary Artery Disease

Note: France data are for 2000. Source WHO

# Cancer by site, selected countries,

Standardised death rates per 100,000.

## Components of Cancer by site, 2001

Standardised Death Rates, selected European countries,  
per 100,000

	TBL	Breast	Prostate
Portugal	21.9	23.5	26.7
Sweden	25.4	22.1	<b>37.0</b>
Bulgaria	29.3	20.2	15.7
Norway	33.3	24.3	36.8
Spain	35.0	21.2	22.3
Russia	37.2	23.8	13.4
Italy	37.4	25.5	17.9
Greece	39.0	22.7	17.7
Iceland	39.4	17.7	30.6
UK	42.1	30.9	27.3
Poland	52.5	21.5	22.3
Hungary	<b>64.8</b>	<b>31.6</b>	27.8
<b>Europe</b>	<b>35.9</b>	<b>24.6</b>	<b>19.6</b>

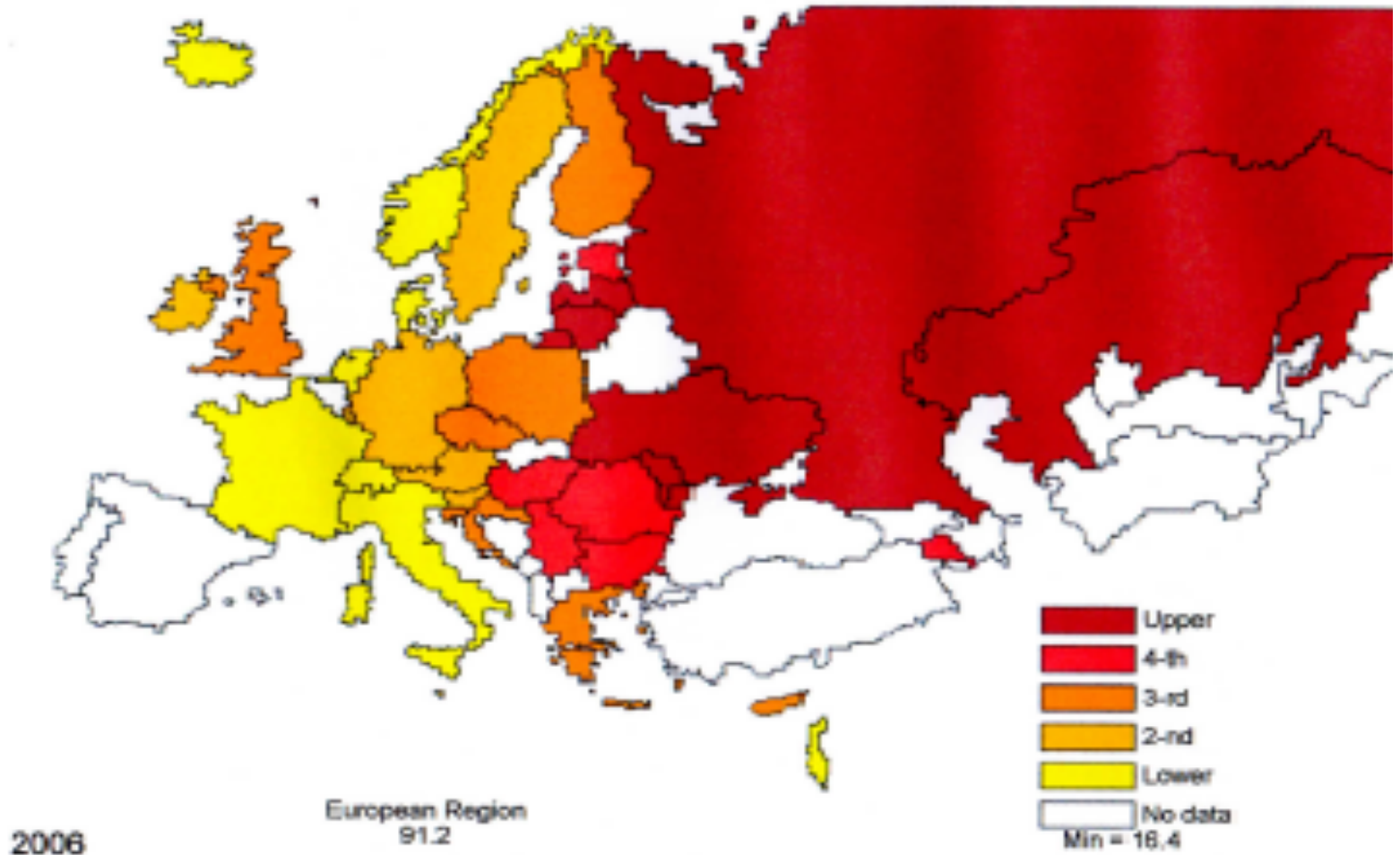
TBL: Trachea, Bronchus and Lung. Albania excluded. Source: WHO 2005



# Europe 2006, SDR Ischaemic Heart Disease, males aged 0-64 per 100,000. Source: WHO Europe

Scale Indicators Type of map [Print](#) [Quit](#)

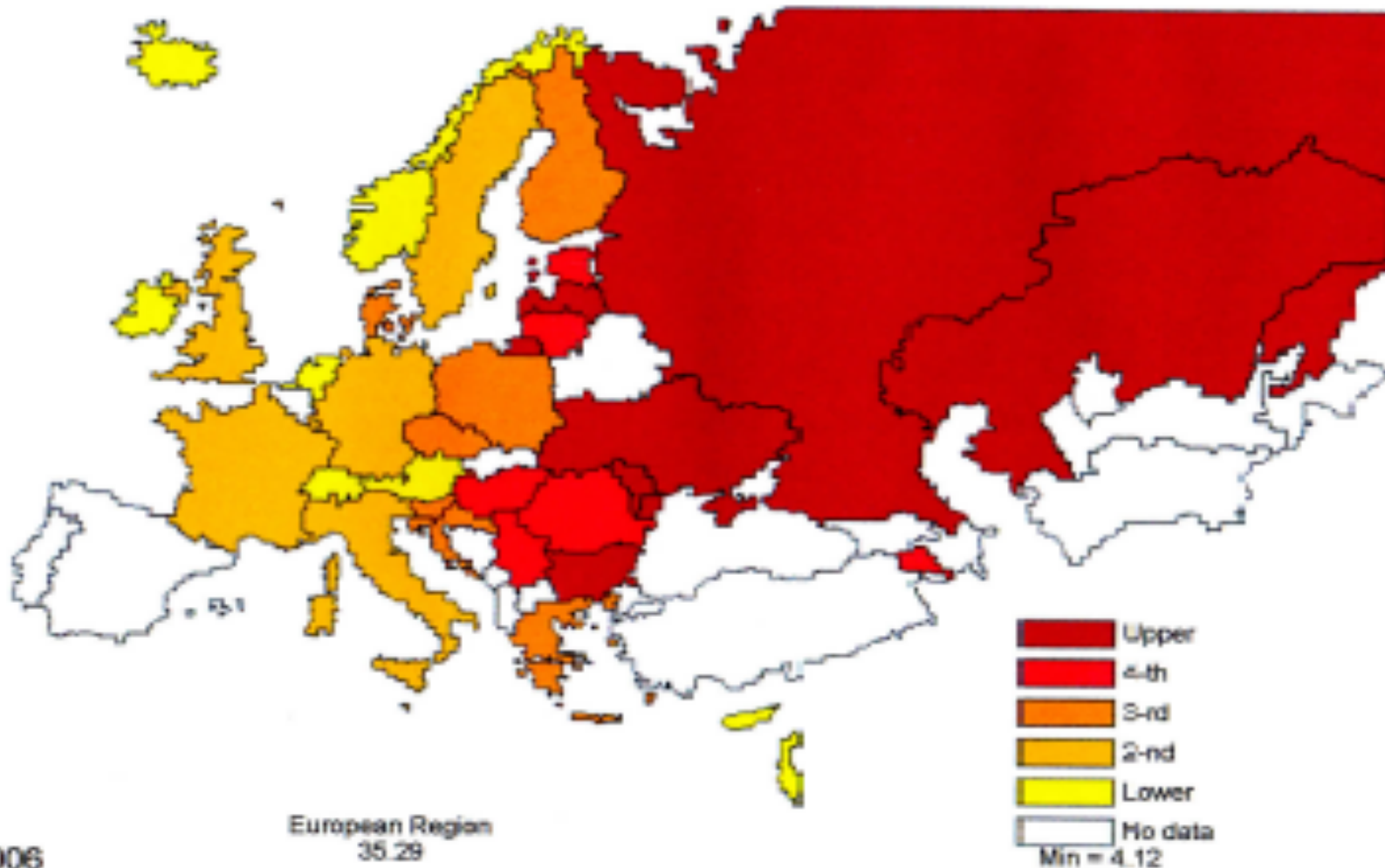
SDR, ischaemic heart disease, 0-64 per 100000, male



# Europe 2006, cerebrovascular disease, males 0-64 per 100.000. Source WHO Eurone.

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SDR, cerebrovascular diseases, 0-64 per 100000, male



## Explaining mortality differences

National wealth (GDP per capita).

National Health expenditure.

National Wealth inequality ( 'The Spirit Level' )

Risk factors, diet and lifestyle.

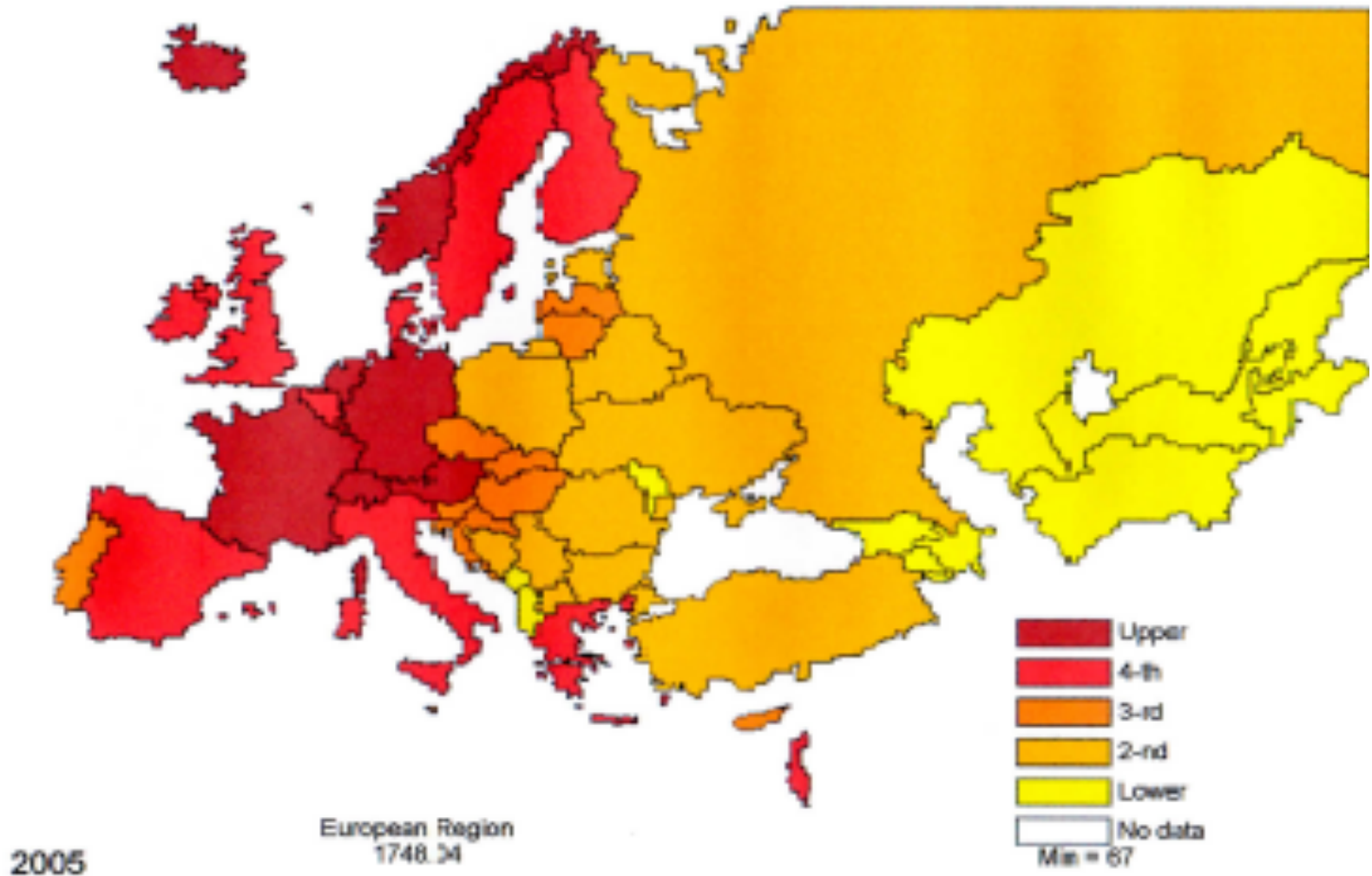
Politics, freedom of information and choice.

Crises.

# Europe 2005. Total Health Expenditure, PPP\$ per capita. Source: WHO Europe.

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Total health expenditure, PPP\$ per capita, WHO estimates



# ‘Diseases of affluence’

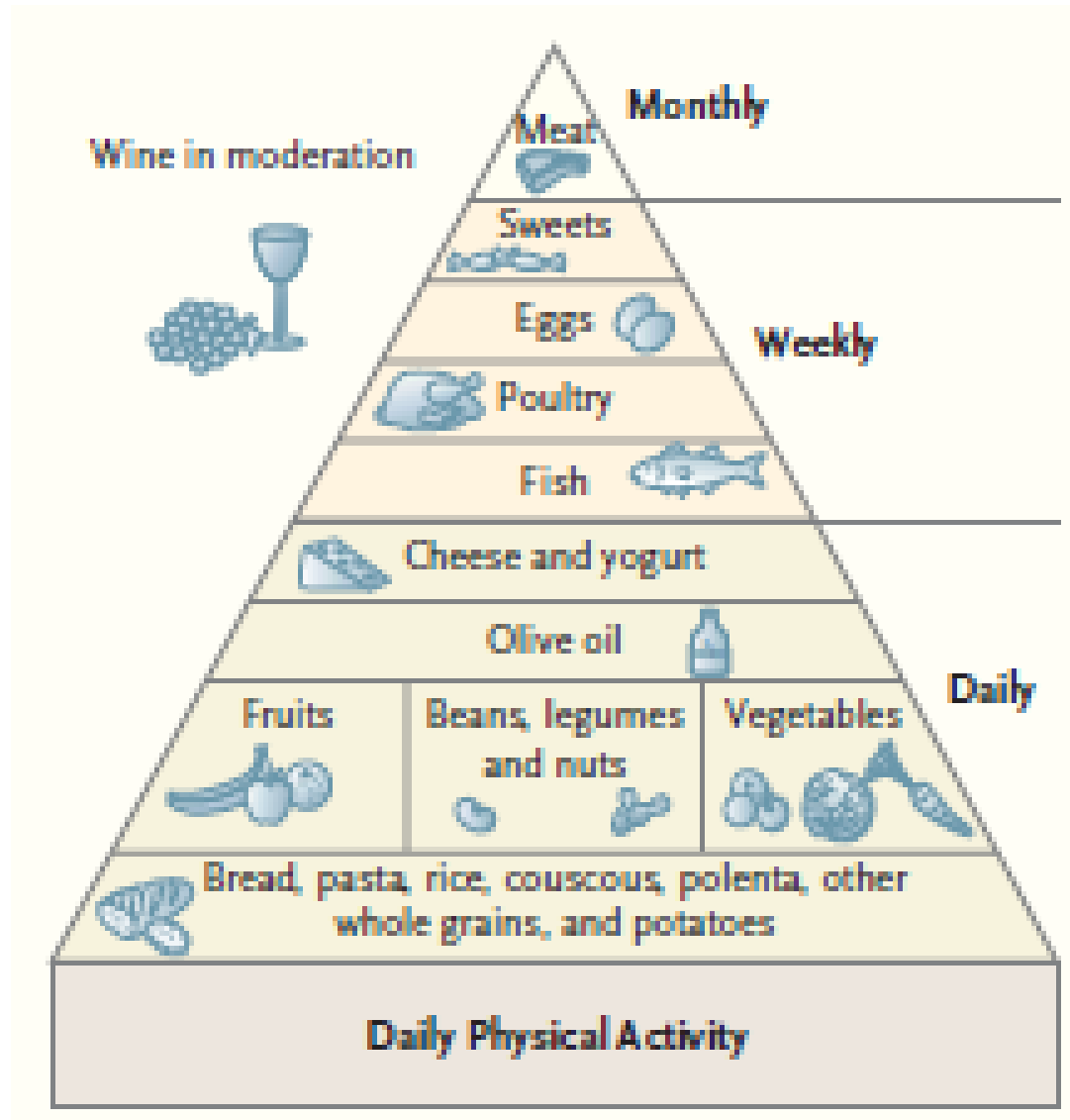
Why heart disease, stroke etc?

Inevitable consequence of old age /  
senescence? Or avoidable environment /  
lifestyle effect?

No longer ‘diseases of affluence’ . Shift from  
upper to lower social levels, from rich  
‘developed’ countries to poor ones, and  
now to the developing world.

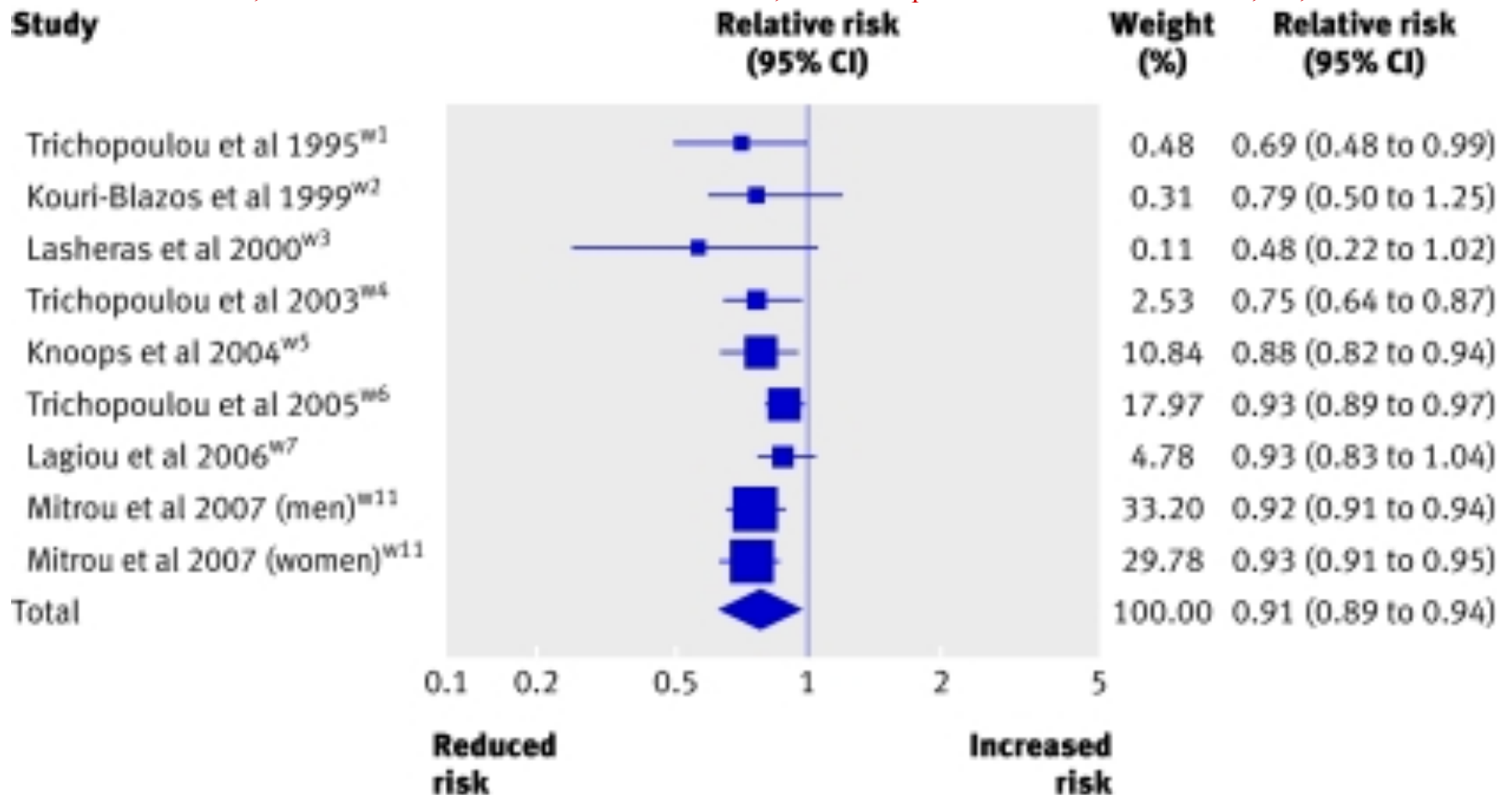
# Outline of the ‘Mediterranean diet’

Source: Hu 2003, NEJM 348, 2595



# Meta-analysis of 12 prospective cohort studies on effect of Mediterranean diet on overall mortality and mortality from cardiovascular disease, cancer, Parkinson's and Alzheimer's diseases. Source: Sofi et al. BMJ 2008 337.

Risk of all cause mortality associated with two point increase in adherence score for Mediterranean diet. Squares represent effect size; extended lines show 95% confidence intervals; diamond represents total effect size. N = 1,574,299.



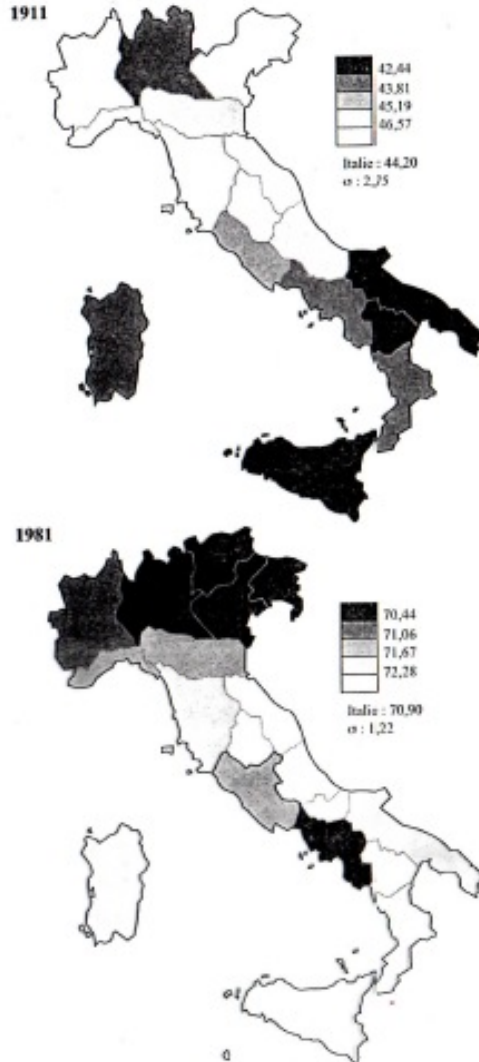


# Reversal of North-South survival gradient, Italy (1911 / 1981) and France (1901/1952 /1981). Source: Caselli, Mesle and Vallin, in Bardet and Dupaquier 1999. Darker = lower.

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HISTOIRE DES POPULATIONS DE L'EUROPE

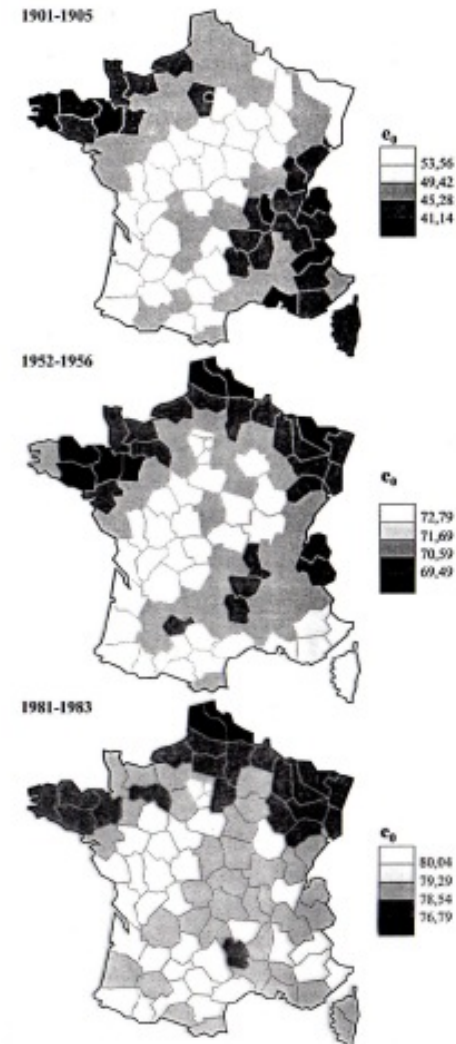
Fig 43. *Espérance de vie à la naissance des hommes en Italie, en 1911 et en 1981*



LE TRIOMPHE DE LA MÉDECINE

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Fig 42. *Espérance de vie à la naissance en France des femmes, 1901-1905, 1952-1956 et 1981-1983*





# The State Socialist Mortality Syndrome 'ideological industrialism'

Source: Elwood and Hoffmann 2010.

Failure of health services not a good explanation - middle aged men used this least

## **A. 'Hyperindustrialism / proletarianization**

1. State ownership of production, monopoly, 'soft' budgets
2. Faulty input - output ratios  
(maximum resource input, output minimized thanks to above)
3. multi-dimensional centralism  
(urbanization, fusion of political and economic power)
4. planning replaces market signals

## **B Pathways to high mortality**

1. forced rural - urban migration  
disruption of social contacts  
family separation, stressful commuting.
2. residential gigantism and anonymity (new mass housing )  
state trade unions, unsafe work, no independent courts  
suppression of civil society - social and civic institutions  
restriction of consumer services  
state-sanctioned promotion of alcohol and tobacco

# What happens next?

## 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

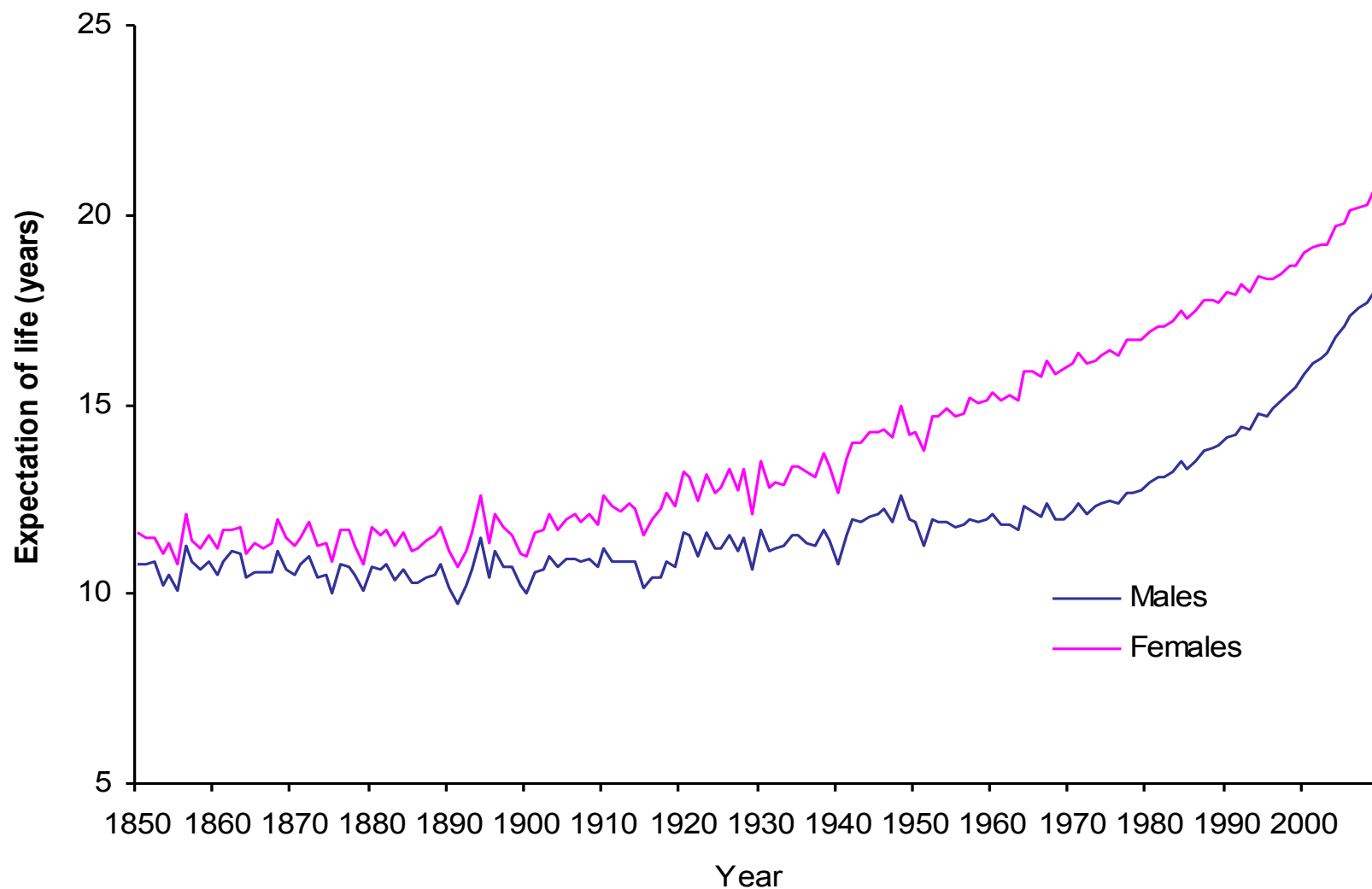
Emergence of new diseases (eg HIV, SARS)

Re-emergence of old diseases (eg TB)

Environmental change, disasters, wars

Changes in population composition; cohort effects, migrants

# Period expectation of life at age 65, England and Wales.



# Obesity blamed as more mothers die in childbirth

► Some deaths are 'due to doctors' lack of skills'

► Maternity services are 'failing to keep up'

Nigel Hawkes Health Editor

Deaths of mothers during childbirth are rising, and some potentially avoidable fatalities have happened because doctors and midwives do not have the appropriate professional skills, a report says.

*Saving Mothers' Lives*, which looks at maternal deaths between 2002 and 2005, says that maternity services are failing to keep up with the growing complexity of childbirth.

It says: "A lack of clinical knowledge and skills among some doctors, mid-

wives and other health professionals, senior and junior, was one of the leading causes of potentially avoidable mortality."

The report, produced by the Confidential Enquiry into Maternal and Child Health, calls for better communication between staff, better training, and greater awareness of the risks.

Many health professionals "failed to identify and manage common medical conditions or potential emergencies outside their immediate area of expertise" and had poor resuscitation skills, the report says.

Giving birth in Britain remains very safe for mothers, but is becoming statistically riskier as a result of immigration, obesity and disadvantage.

● Half the women who died were overweight or obese, and more than 15 per cent were extremely obese.

● Women from the poorest communi-



Giving birth in Britain is still very safe, but deaths in pregnancy are rising

ties, including ethnic minority communities, were up to seven times more likely to die.

● Women who were first examined 20 or more weeks into pregnancy or who had no antenatal care at all represented only about one in 50 births, but one in five deaths.

Louise Silverton, the deputy general secretary of the Royal College of Midwives, said: "This report throws a spotlight on issues that need addressing urgently. More has to be done to

improve women's health and to bridge the chasm of health inequality separating rich and poor."

She said that there was a "serious and worsening shortage of midwives", although they are the workers able to do most to reverse the trends detailed in the report.

The inquiry found that in the three years between 2003 and 2005, 295 women died as a direct or indirect result of pregnancy and childbirth. The corresponding figure for 2000-02

**'More must be done to bridge health chasm between rich and poor'**

was 261, but births have also increased, so the proportion was not statistically different. The rate of deaths was 13.95 per 100,000 births, a very small number. But the rate in 2000-02 was 13.07, and in 1985-87 it was 9.83.

The conclusion is that in the past 20 years maternity care has failed to improve. Its task has become harder, as more mothers are older, fatter, or from disadvantaged communities.

The commonest cause of death overall was heart disease. The report said: "In the main this reflects the growing incidence of acquired heart disease in younger women related to less healthy diets, smoking, alcohol and the growing epidemic of obesity."

Six of the women who died had a body mass index (BMI) over 45 and two over 60. A healthy BMI is between 18.5 and 24.9.

Gwyneth Lewis, director of the inquiry, said the number of deaths was being "artificially inflated" by figures for women entering Britain as migrants, refugees and asylum-seekers.

► **The pre-baby blues**  
Times2, pages 4 and 5

# sity rates soar as world's poor pile on pounds

weight people for the first time with the world, says Sk.

on overfed equal to the too little to be piling on with western

ices move entry to a life.

half of all

adults are now too fat, and obesity rates have doubled in a decade. Latin American countries are rapidly catching up. In Brazil, 31% of the population are overweight, and in Colombia the figure is 43%, even though millions in both countries endure crushing poverty.

Even in China, which has traditionally had a healthier, non-dairy, vegetable-based diet, the number of overweight people jumped from 9% to 15% of the

population between the late 1980s and the early 1990s.

The statistics, presented in a study by the Worldwatch Institute, a Washington-based research organisation, indicate even worse health problems to come. Those malnourished in the womb and born underweight carry a high risk of developing conditions such as diabetes and heart disease in later life if they overeat.

Heart disease, rather than hun-

**Lois Rogers and Lilian Nduta**

ger or tuberculosis, is India's biggest killer of people under 70. The burden of treatment will be severe for a country that has only basic health services in many areas. Yet obesity, common among the Indian rich, coexists with the world's largest population of underweight, malnourished children.

David Barker, director of the Medical Research Council's epidemiology unit and a world expert on the problem, said: "There are many fewer people who have to walk miles every day to get water or firewood and, given their much lower exercise rate, their food intake becomes adequate or even excessive."

The Worldwatch report says deficiencies of micronutrients and overeating are almost as

closely linked to health as hunger, leading to diseases from the common cold to cancer. It points out that, in the developing world, people are failing to adjust calorie intake to changed lifestyles and have uncontrolled consumption of sugar and fats.

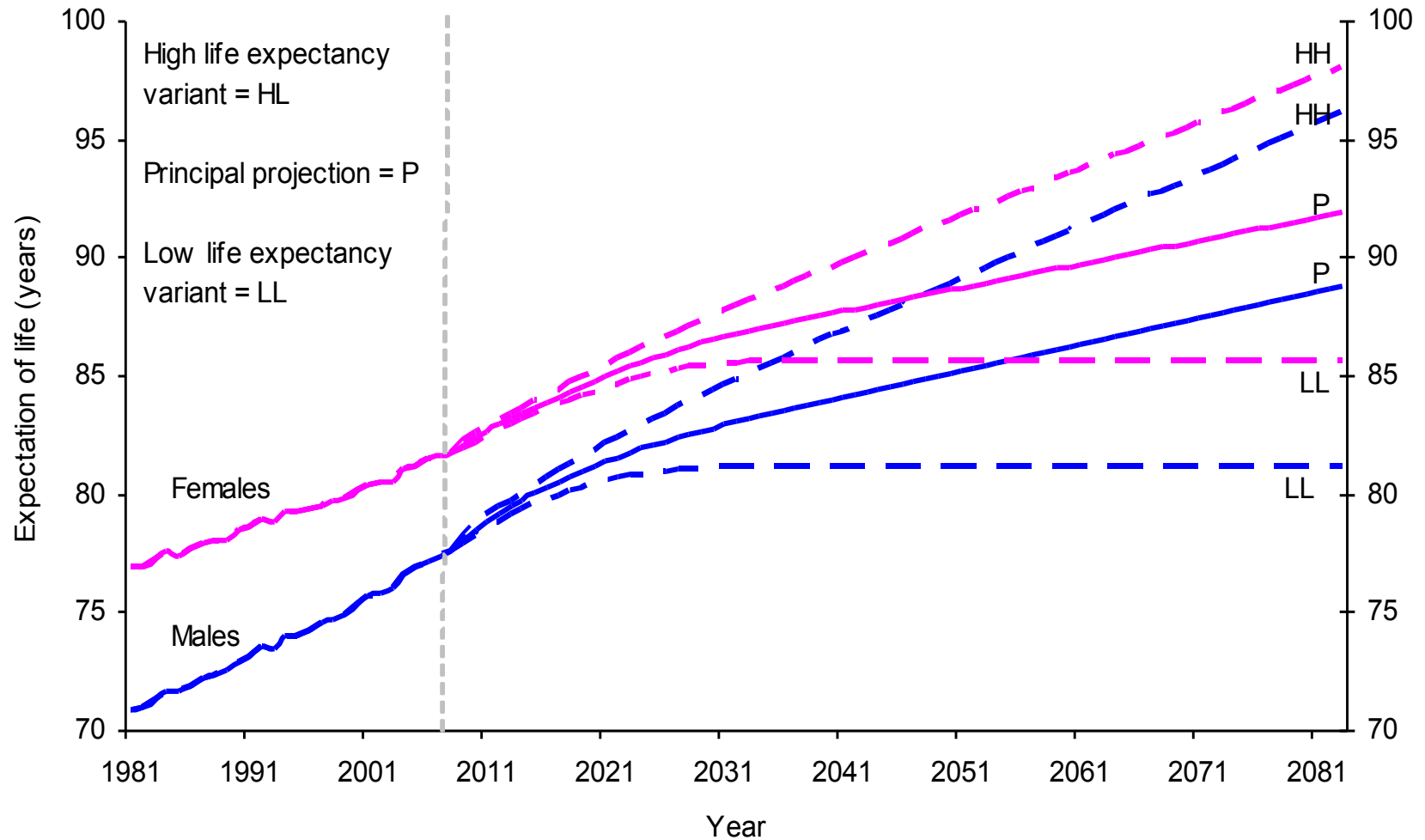
Treating obesity-related diseases costs Britain £2 billion a year, or 6% of the national health budget. Andrew Prentice, an obesity expert at the London School of Hygiene and

Tropical Medicine, said: "The government has done little to curb the problem. It abandoned national targets to reduce obesity set 10 years ago. It is a complex problem, and that is why there is reluctance to tackle it."

Most experts believe the only remedy is to encourage people to increase their exercise dramatically, from simply walking more instead of driving, to making greater efforts to participate in sport.

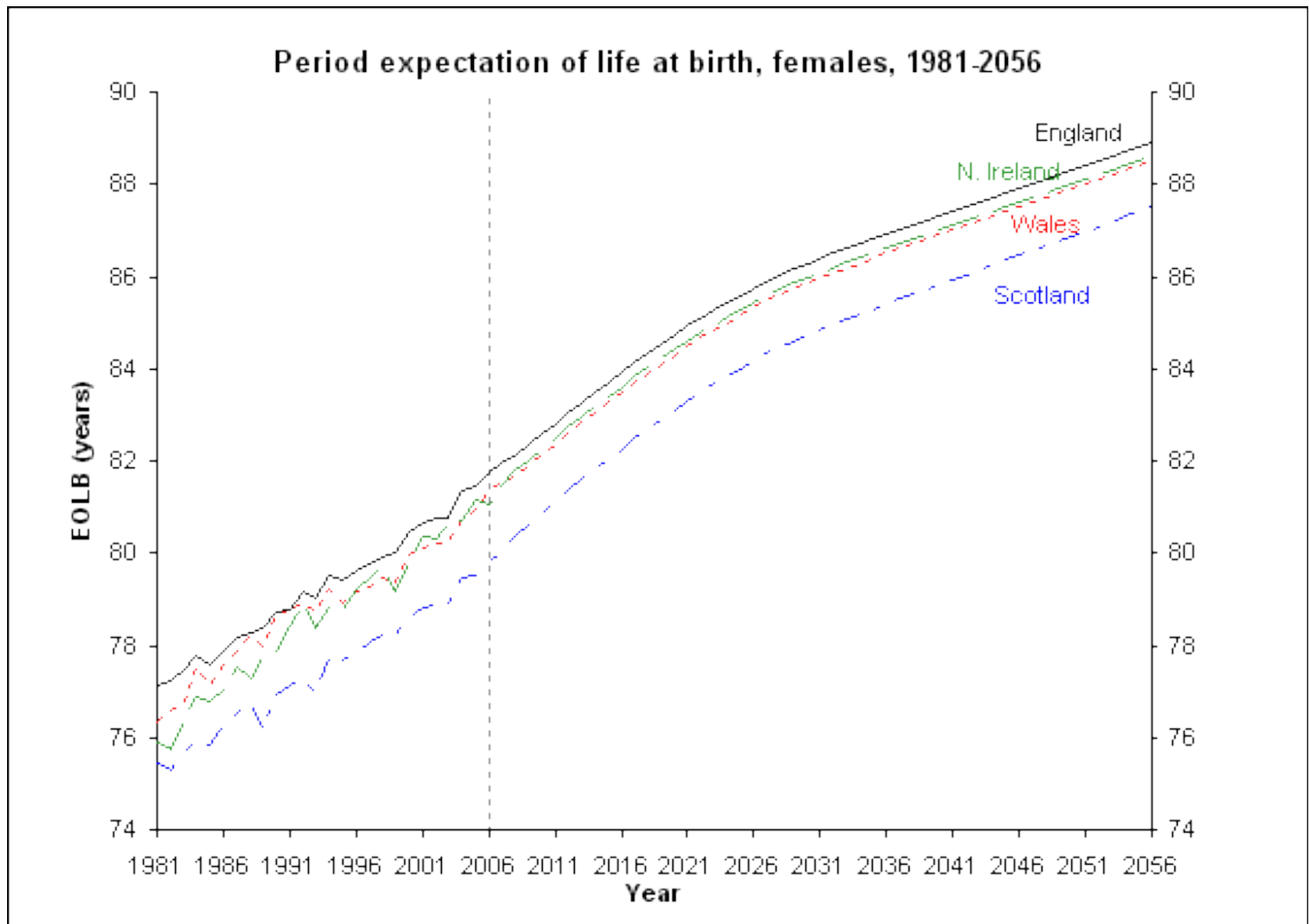
# Period expectation of life at birth, UK, projection 2008 – 2081. Source: Adrian Gallop, ONS

## 2008-based projections



# UK 1981 – 2056 period expectation of life at birth (females).

Source: GAD 2007.





Edgar Sharpe born January 18 1886, died Friday May 27 1994 aged 108.

Source: Times May 28 1994.



Edgar and Hilda Sharpe on their wedding day. Mrs Sharpe lived to be 95



Marjorie Sharpe, 75, at home with her father

## Britain's second oldest man dies

By ANDREW PIERCE

EDGAR Sharpe was born on January 18, 1886, a few days before Lord Salisbury resigned as Prime Minister. It was the year that Thomas Hardy published *The Mayor of Casterbridge* and that the parliamentary revolt over home rule for Ireland led to Salisbury returning to Downing Street within months of his defeat.

Yesterday Mr Sharpe, believed to be Britain's second oldest man, died aged 108. He had never spent a night in a hospital until an operation a few days ago after breaking his hip at the home he shared with his daughter for 60 years. He died shortly after the operation.

He was among the first generation of children to read Rudyard Kipling's *Jungle Book*, written when Mr Sharpe was eight. He started work at 13 as a trainee mechanic. By the time he had completed his training in 1906, Sylvia Fankhurst was

in jail for suffragette activities and the British empire spanned a fifth of the globe.

Mr Sharpe was 28 when the First World War broke out. In the year of his half century, 1936, Edward VIII announced his abdication and Fred Perry became the last British man to win the Wimbledon singles title.

Mr Sharpe sang in a church choir until he was 90. His parents and grandparents had lived into their nineties and his wife Hilda died in 1982, aged 95. Their only child, Marjorie, is 75.

On his last birthday Mr Sharpe, of Thornhill Lees, West Yorkshire, gave as the reasons for his longevity: "A healthy appetite and brown bread, not white."

The oldest man in Britain is said by *The Guinness Book of Records* to be William Proctor, who was 108 last June. The oldest man in the world is believed to live in France, aged 109.

Henry Allingham, whose life spanned three centuries, photographed in 1899, 1918 and 2004. Died age 108 in 2009.

## Air Mechanic Henry Allingham

*Veteran of the Battle of Jutland and the world's oldest man, who never forgot the Great War trenches*





# Conclusions

Mortality falling in almost all developed countries.

20<sup>th</sup> century divergence between West and East

Persistent differences in level of mortality and causes of death.

Interest focused on survival and active life expectation of elderly.

Unresolved scientific dispute on prospects of longer life – not all trends favourable.

Given stable fertility, future ageing will depend more on lower mortality.