

# Demand for Long-term Residential Care by Older People in Finland in relation to Age and Proximity to Death

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new dynamics of ageing  
a cross-council research programme

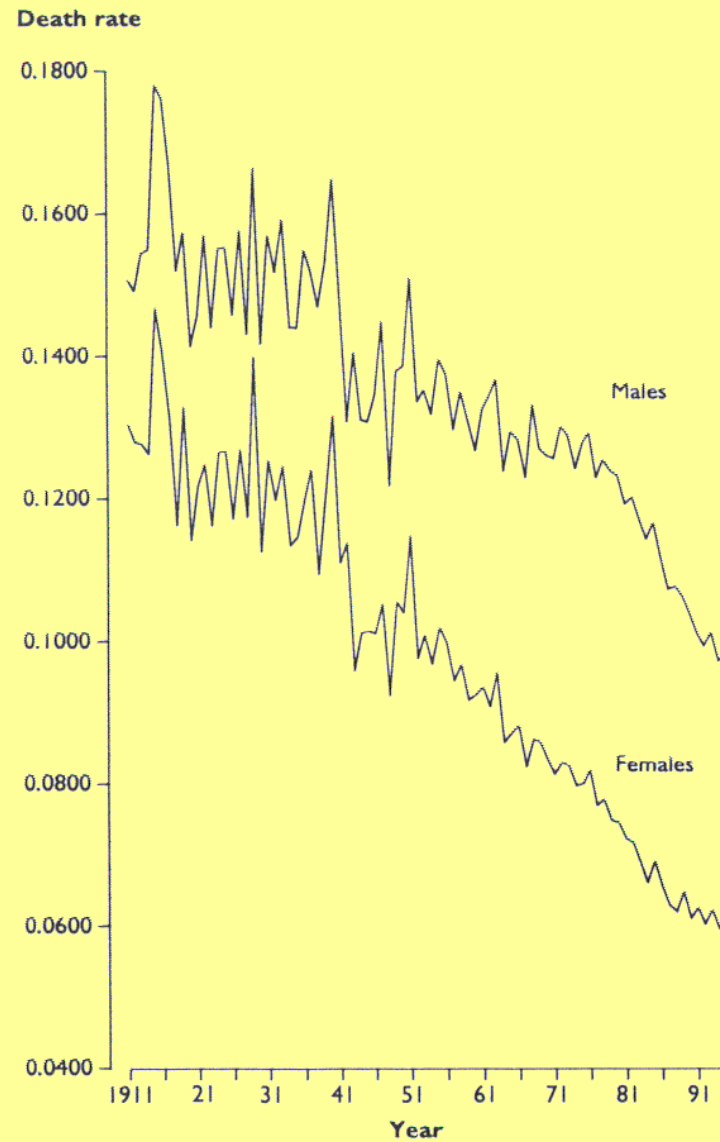


# What is happening to death rates at old ages?

- Vaupel confirmed that mortality rates do not follow a Gompertz curve. There is a plateau at the very old ages.
- An extreme improvement of mortality at old ages recently
- The number of centenarians is increasing dramatically.

**Figure 3**

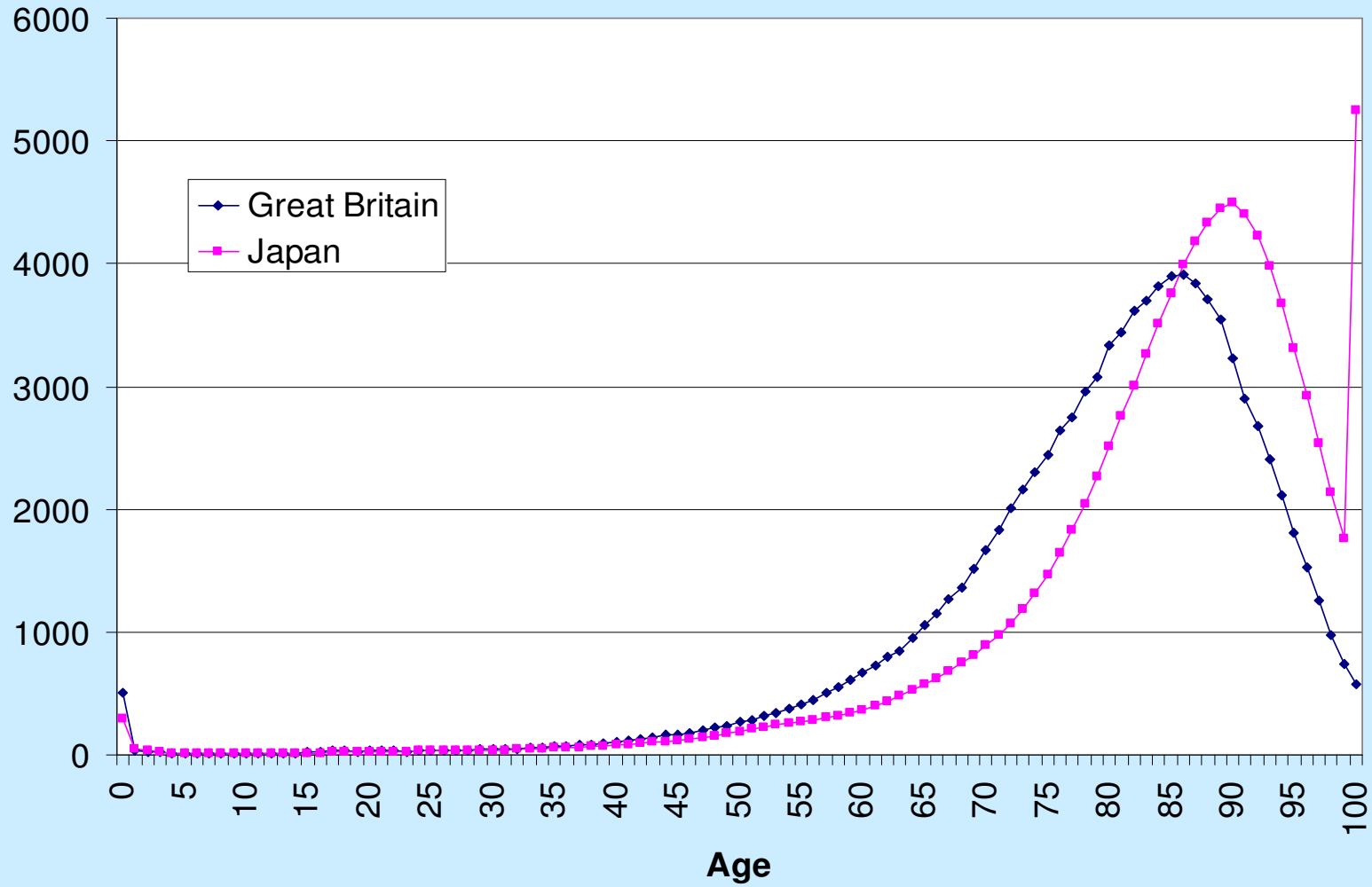
Death rates at age 80  
England and Wales



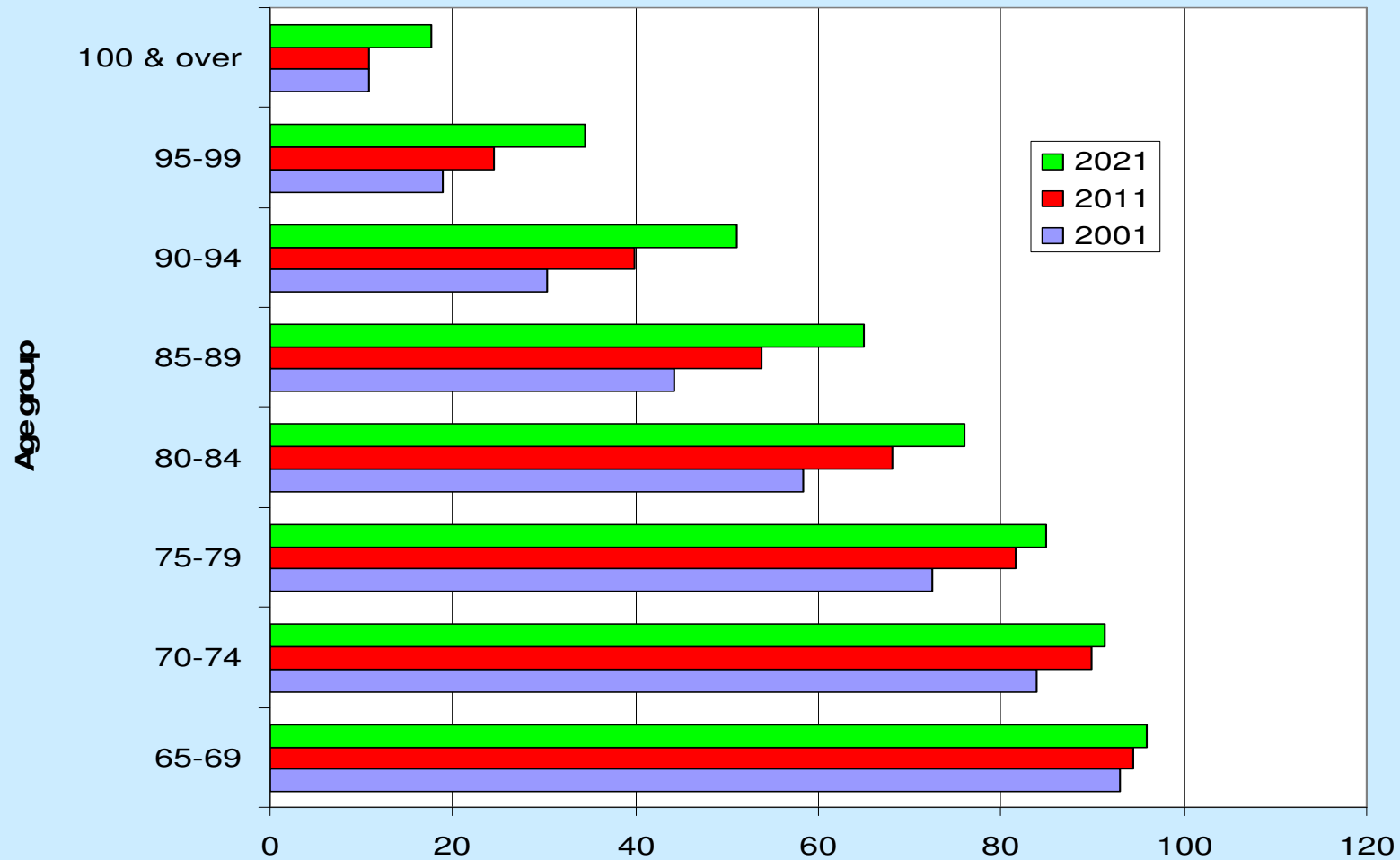
Mortality  
declines at age  
80, England  
& Wales

(Thatcher, 1999)

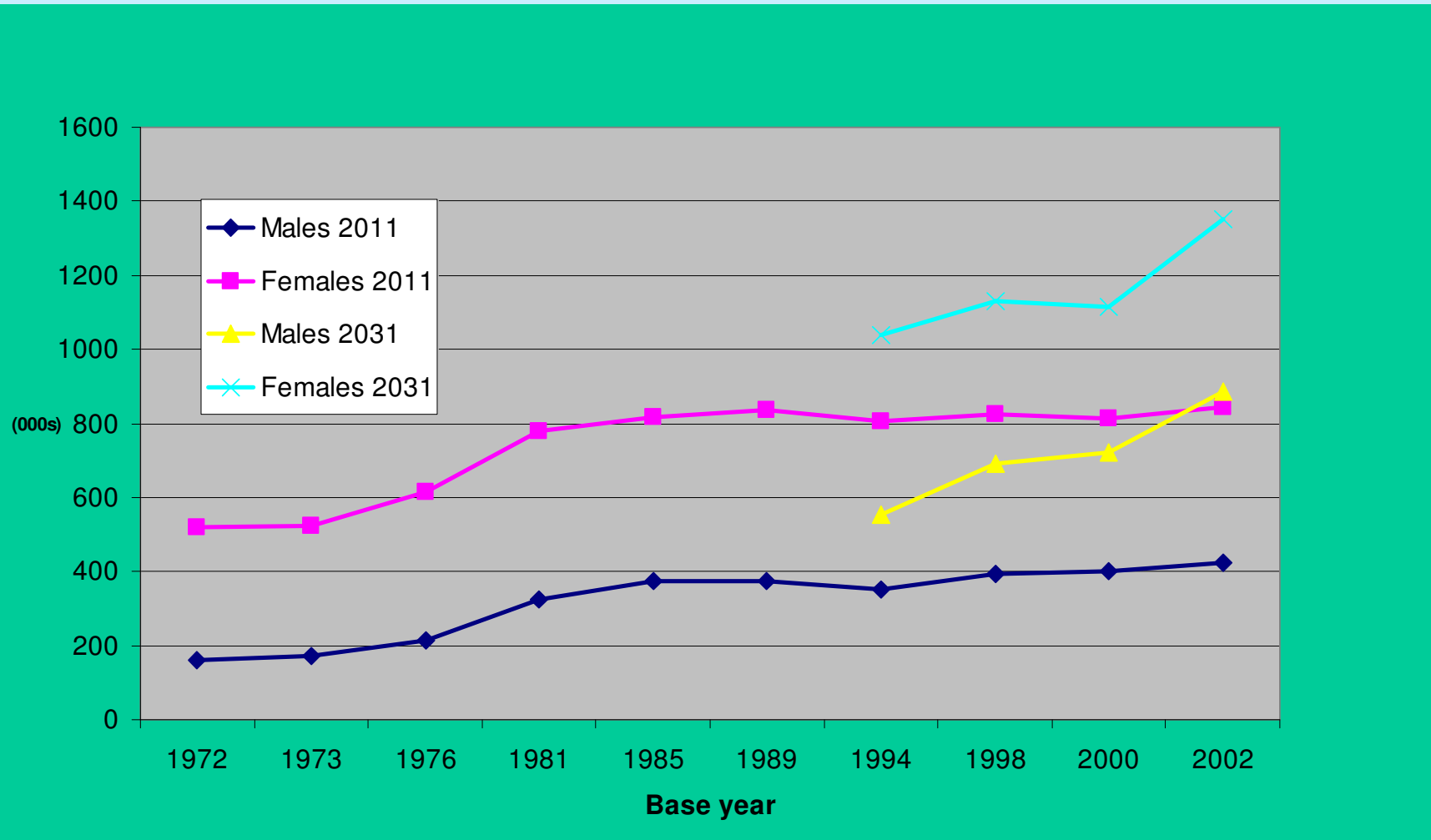
## Distribution of deaths out of 100,000 births, Females GB 1997-99 & Japan 2000



# Sex Ratio (Males per 100 Females), England & Wales 2001, 2011 & 2021

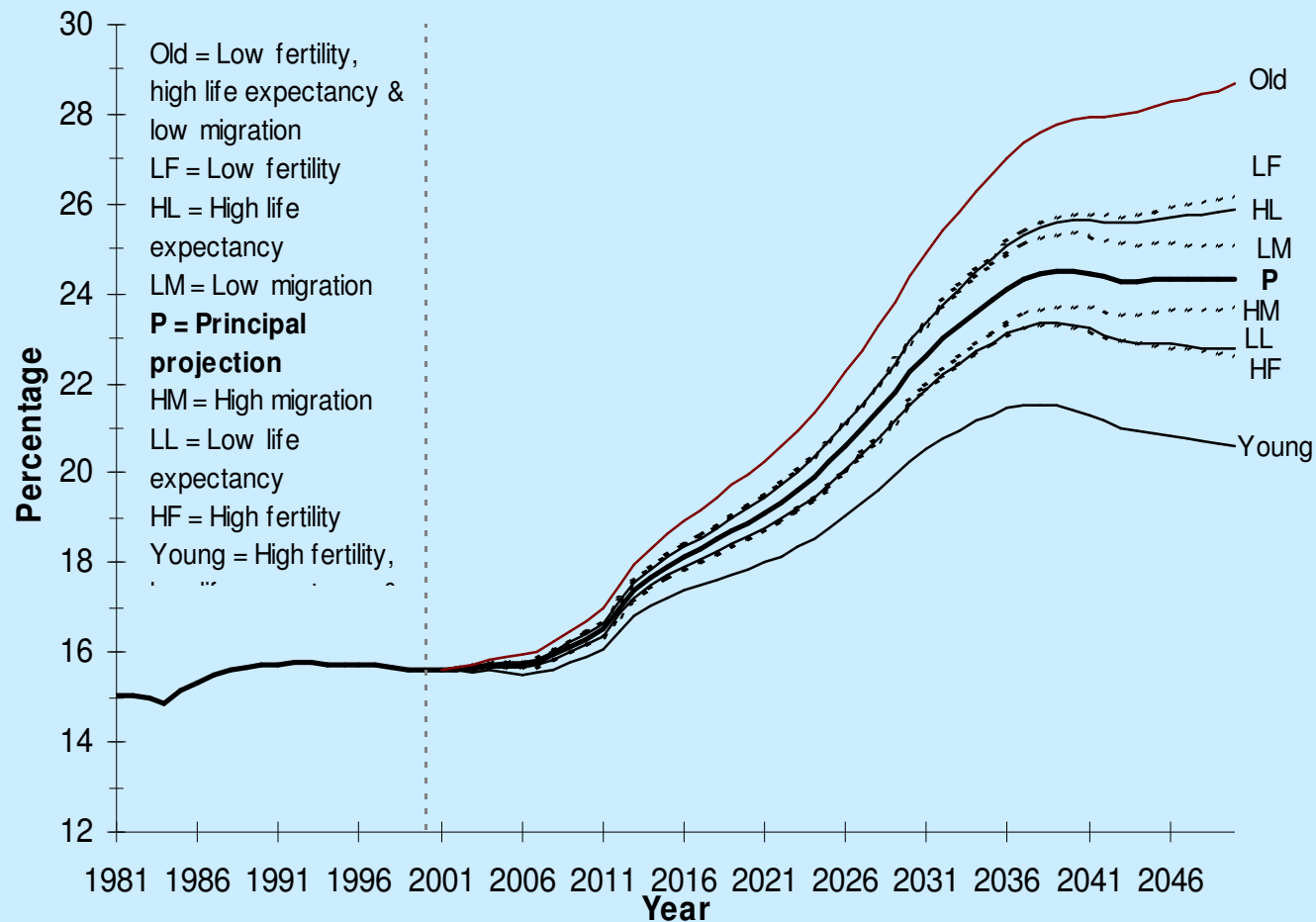


# Projections of population aged 85 & over, E&W by Base year



(based on National Statistics and Government Actuary's Department, various)

# Proportion of the population aged 65 and over, United Kingdom, 1981-2050, under various projection assumptions (2000 projections)



(National Statistics and Government Actuary's Department)

# Mortality, change and health at older ages - simplified models

## **Negative:**

Increased survival of individuals with unfavourable health legacy/high frailty risks leads to worsening population health at older ages ( i.e.. reduced selection effect).

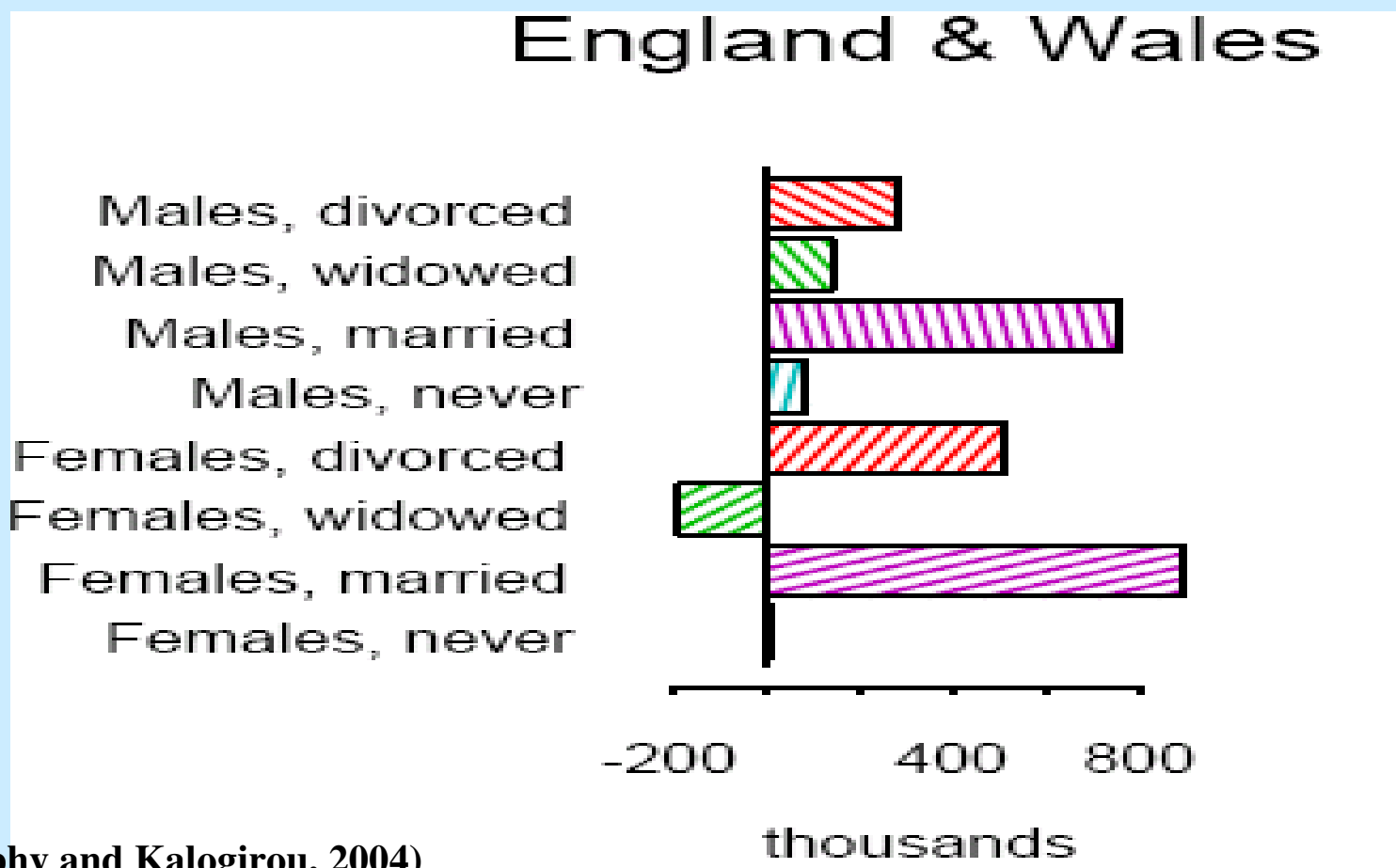
Extension of morbidity due to longer survival of those with chronic degenerative diseases.

## **Positive:**

Increased survival to later adulthood implies better health legacy.

Increased survival in later adulthood implies postponement/prevention degenerative diseases and/or better management and so reduced disability.

# Summary of Marital Status projections of those aged 75 & over, E&W 2000-30.



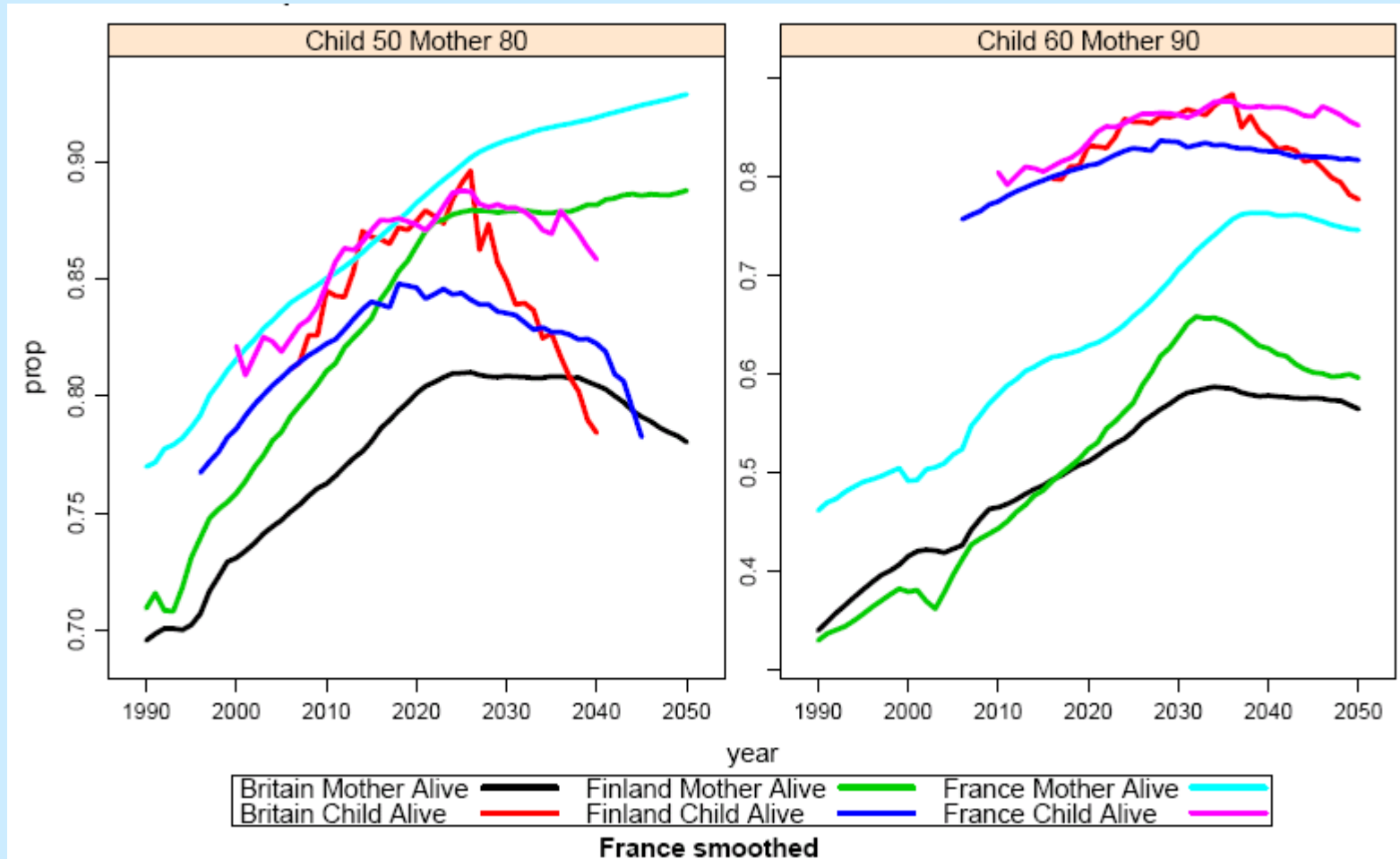
(Murphy and Kalogirou, 2004)

**Social changes like the rising trend for 'singleton families' - only one child, with no sibling to share the burden of ageing parents - are also likely to reduce the amount of informal care provided by relatives.**

**(Institute for Public Policy Research, 2002):**

**The Next Four Decades**

# The next four decades: Proportion of women with child alive & children with mother alive



Michael Murphy M, Martikainen P, Penne S. (2006, forthcoming) Demographic change and the supply of potential family supporters in Britain, Finland and France in the period 1911-2050.

# Wanless Reports

The five years since the (First) Report in 2002 have witnessed unprecedented levels of government investment in the NHS – there has been average annual real term growth of 7.4 per cent over the five years to 2007/8. Over that period, real spending on the NHS has risen by nearly 50 per cent – a total cash increase of £43.2 billion – while the proportion of the United Kingdom's gross domestic product (GDP) devoted to health care spending has grown to 9–10 per cent, within striking distance of the European Union average.

# Wanless (p 131)

## Demography

- Over the next 20 years, the UK population is expected to grow by between 2 million and 8 million and the proportion of people aged over 85 will rise by between 37 per cent and 94 per cent.
- Age and people's proximity to death are the most significant determinants of health status and health needs.

# The Background: Wanless

- People's health care needs are higher as they approach death.
- Part of older age groups' higher cost will reflect the greater number of people close to death as well as age related health care needs.
- Acute health care costs are strongly associated with proximity to death.
- More than a quarter of all acute health care costs are incurred in the last year of life.

# The Background: Wanless (contd)

- The costs of acute care are strongly associated with proximity to death, regardless of age at death, i.e. health costs for older people are higher mainly because they are closer to death.
- Analysis of demographic pressures that ignores specific costs in the last year of life (i.e. the costs of death) risks overstating its impact. So, the Review split its modelling of hospital care between people in their last year of life (decedents) and those not in their last year of life (survivors)
- Such a split has not been used for social care. There, as costs increase with proximity to death, they also increase with age.

(Wanless Chapter 3 p 43)

# The Background: Wanless (contd)

## **Box 4.1: An example of disease-specific baseline data**

An example of the most detailed breakdown of information in the Review's baseline is non-elective inpatient admissions for heart disease.

Total non-elective inpatient admissions for heart disease in 1998–99 were provided by the Department of Health (Hospital Episode Statistics). These data were available in 21 age groups and for males and females separately, i.e. 42 groups in total. Each age/sex group (for example females aged 50–54) was further split into decedents and survivors using adjusted activity rates from Scottish data. This resulted in 84 separate entries for ordinary non-elective inpatient admissions for heart disease.

Each age/sex/decedent-survivor group for inpatient admissions for heart disease had a unit cost linked to it. The unit cost was based on the average cost per admission across all age/sex/decedent-survivor groups provided by the Department of Health.

These unit costs were multiplied by total admissions to give total costs in each age/decedent-survivor group and then divided by the average length of stay for each of these groups to produce an age and decedent/survivor-specific unit cost for each disease group. The unit costs were not split by sex. So 84 activity entries for inpatient admissions for heart disease were linked to 42 unit costs to produce 84 expenditure figures which, when totalled, produced an estimate of baseline spending on ordinary non-elective inpatient admissions for heart disease.

# Proximity to Death

- Demographic changes have had less of an impact on health spending than many people tend to think. There is a widening body of evidence which shows that proximity to death has a larger impact on health care costs than age. On average, around a quarter of all the health care someone consumes in their lifetime is consumed in the last year of their life.

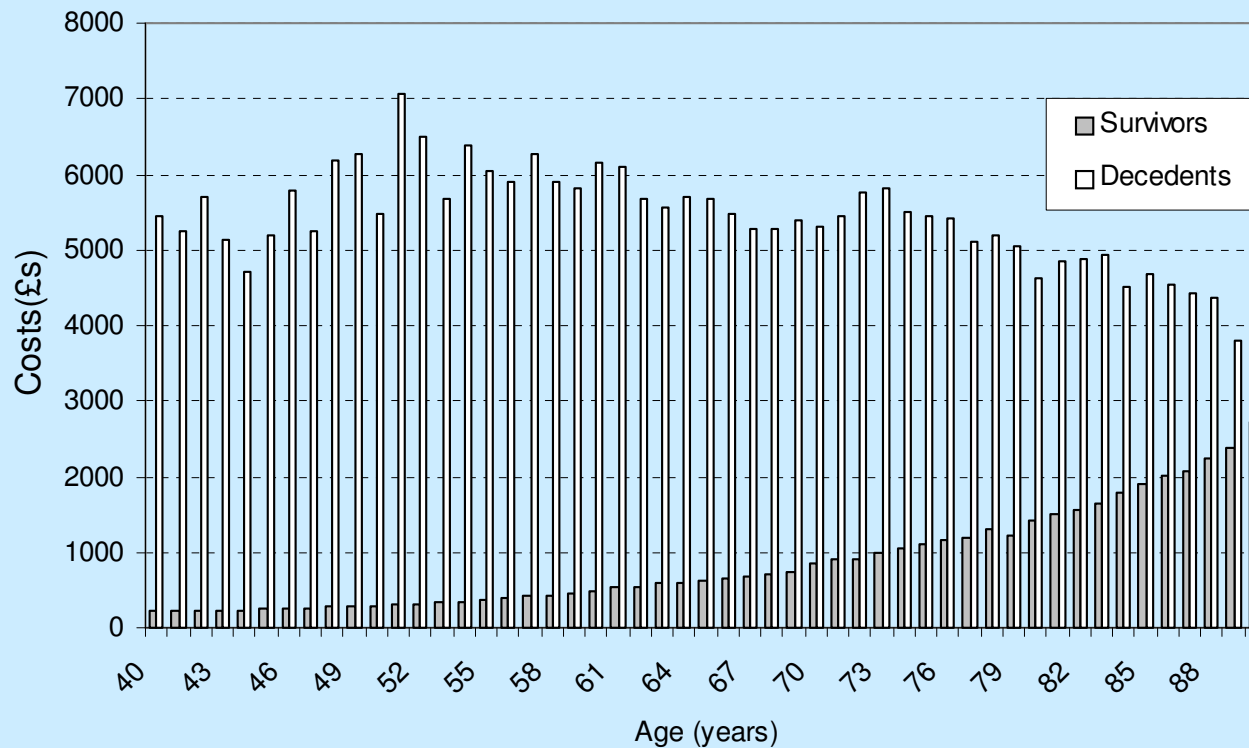
(Wanless Interim Report p20)

## Comparing likely trends in numbers and deaths/years spent in the last year of life, Britain 2001-31

	2001		2031	
75+	Male	Female	Male	Female
Population	1,455,761	2,500,883	2,896,525	3,814,388
Deaths	129,204	204,318	174,808	212,335
<b>ratio 2031:2001 (%)</b>				
Population	<b>199</b>	<b>153</b>		
Deaths	<b>135</b>	<b>104</b>		

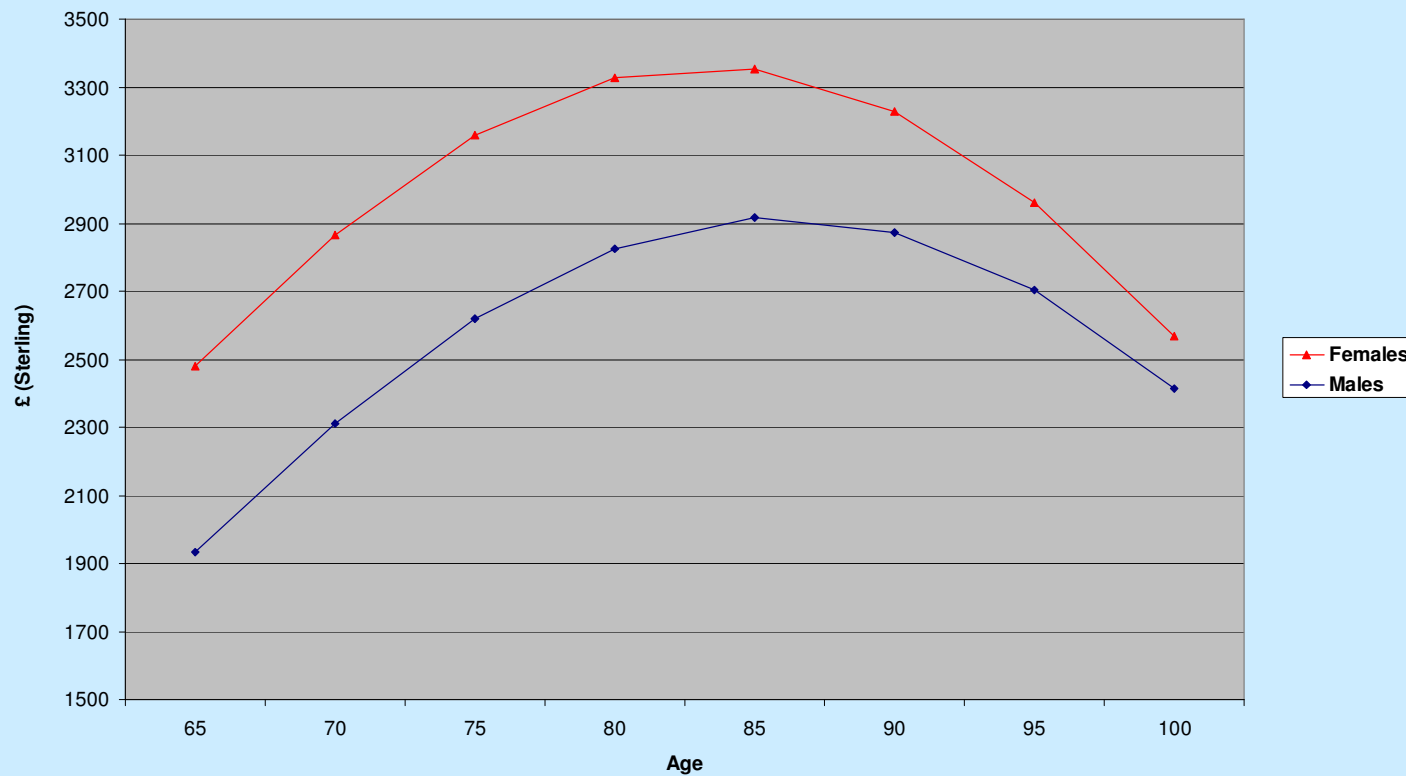
“As Chart 2.7 shows, the cost of the last year of life does not rise with age; if anything, it appears to fall.”

Average HRG costs for decedents and survivors (all population)



Graham, B & Normand, C (2001) Proximity to death and acute health care utilisation in Scotland.

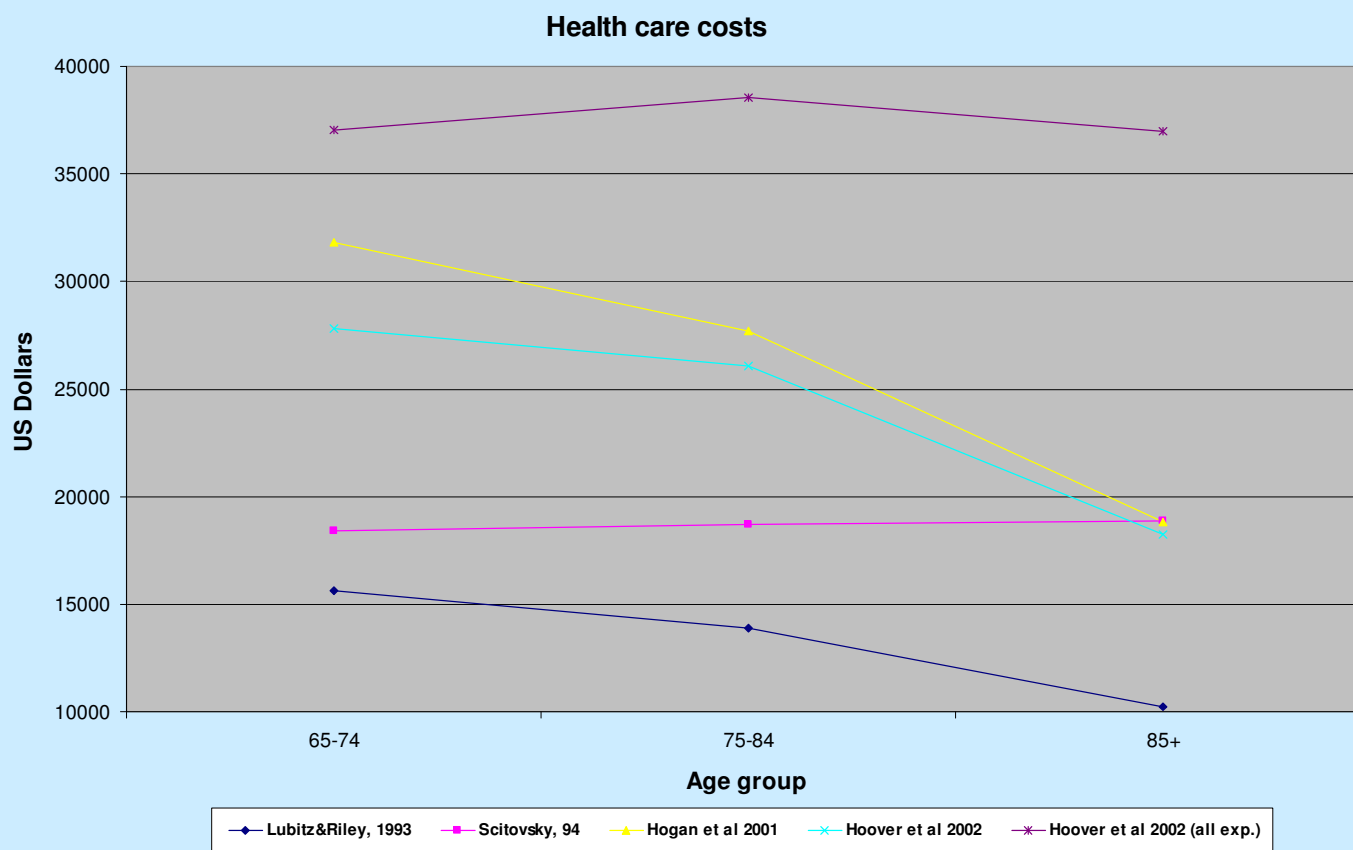
# Average inpatient care expenditure in last year of life



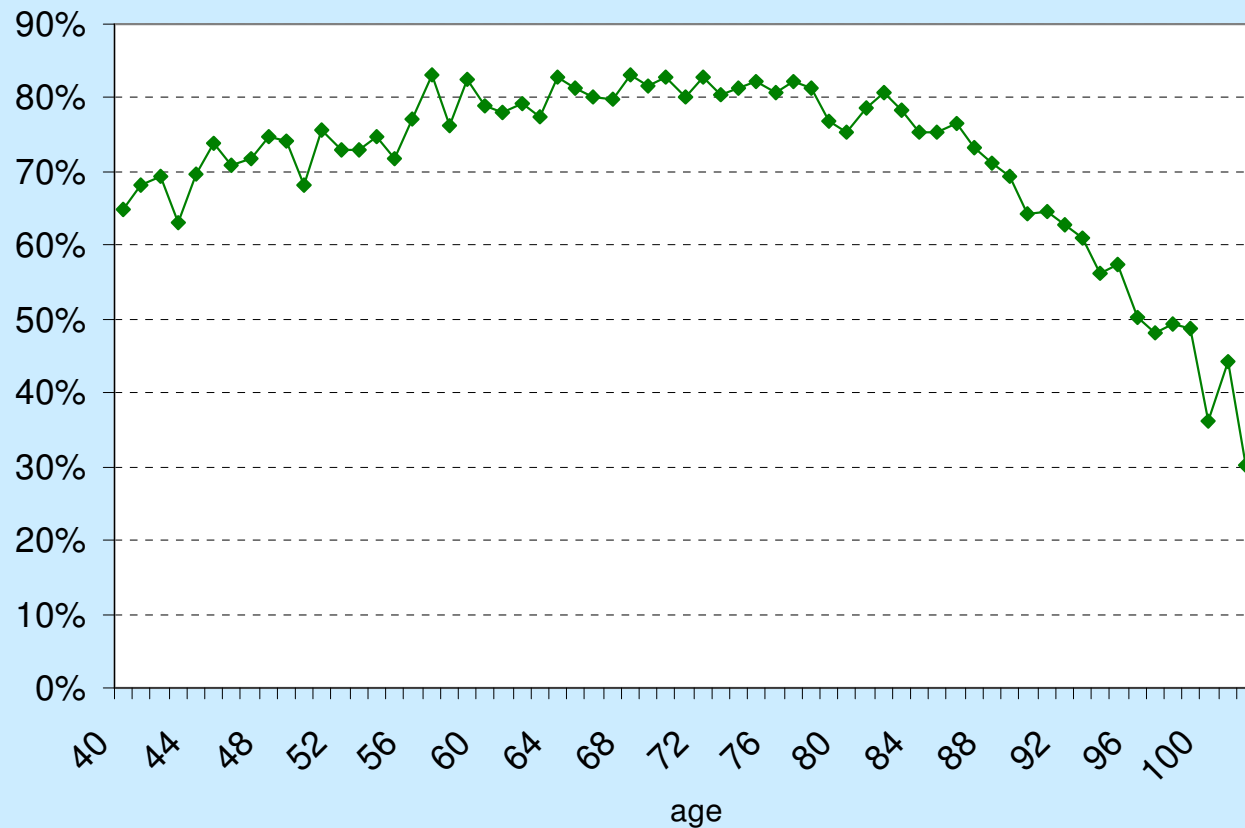
Based on Seshamania, M. and Gray, A., 2004

# Alternative estimates of costs

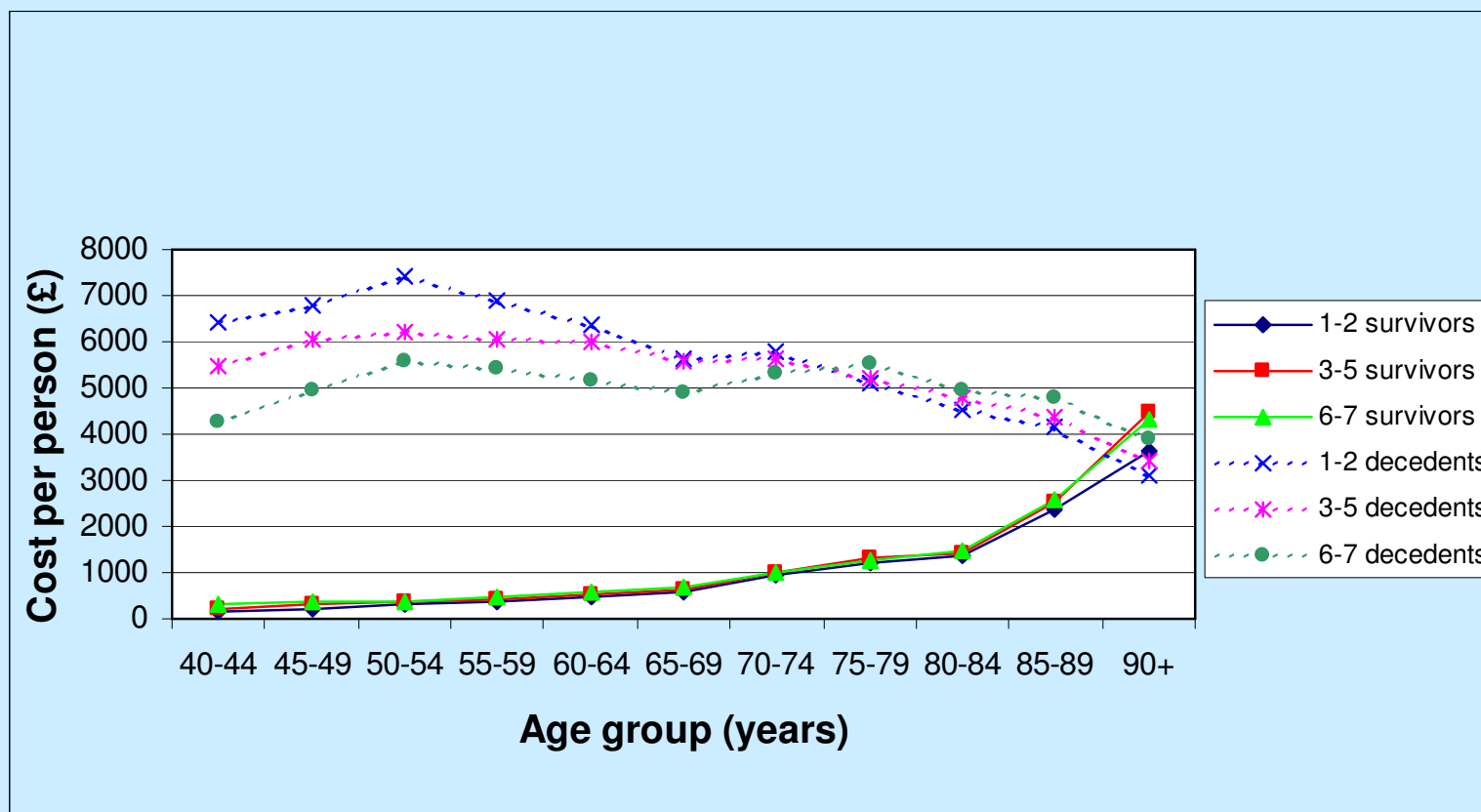
(Hogan et al., 2001)



# Percentage of Decedents with an Inpatient or Daycase episode in the last 12 months of life, Scotland 1999



# Mean cost per person in last year of life (decedents) matched by age and depcat for survivors, Scotland 1999



Graham, B & Normand, C (2001) Proximity to death and acute health care utilisation in Scotland.

# **Medical Expenditures during the Last Year of Life: Findings from the 1992–1996 Medicare Current Beneficiary Survey**

(Hoover et al, 2002)

**mean annual medical expenditures (1996 dollars) for persons aged 65+**

- \$37,581 during the last year of life versus
- \$7,365 for non-terminal years

**last-year-of-life expenditures**

- total largely independent of age at death
- non-Medicare higher and Medicare lower for those dying at older ages

# Wanless (p 21)

- It is therefore possible that the effect of an ageing population will be to postpone rather than increase health service costs. Previous studies have suggested that demographic change will add less than 1 per cent a year to costs. If ageing postpones costs the impact on costs could be lower.
- The evidence suggests that the need for social care services rises sharply with age.  
(McGrail et al 2000)

# Total expenditures (Hoover et al;)

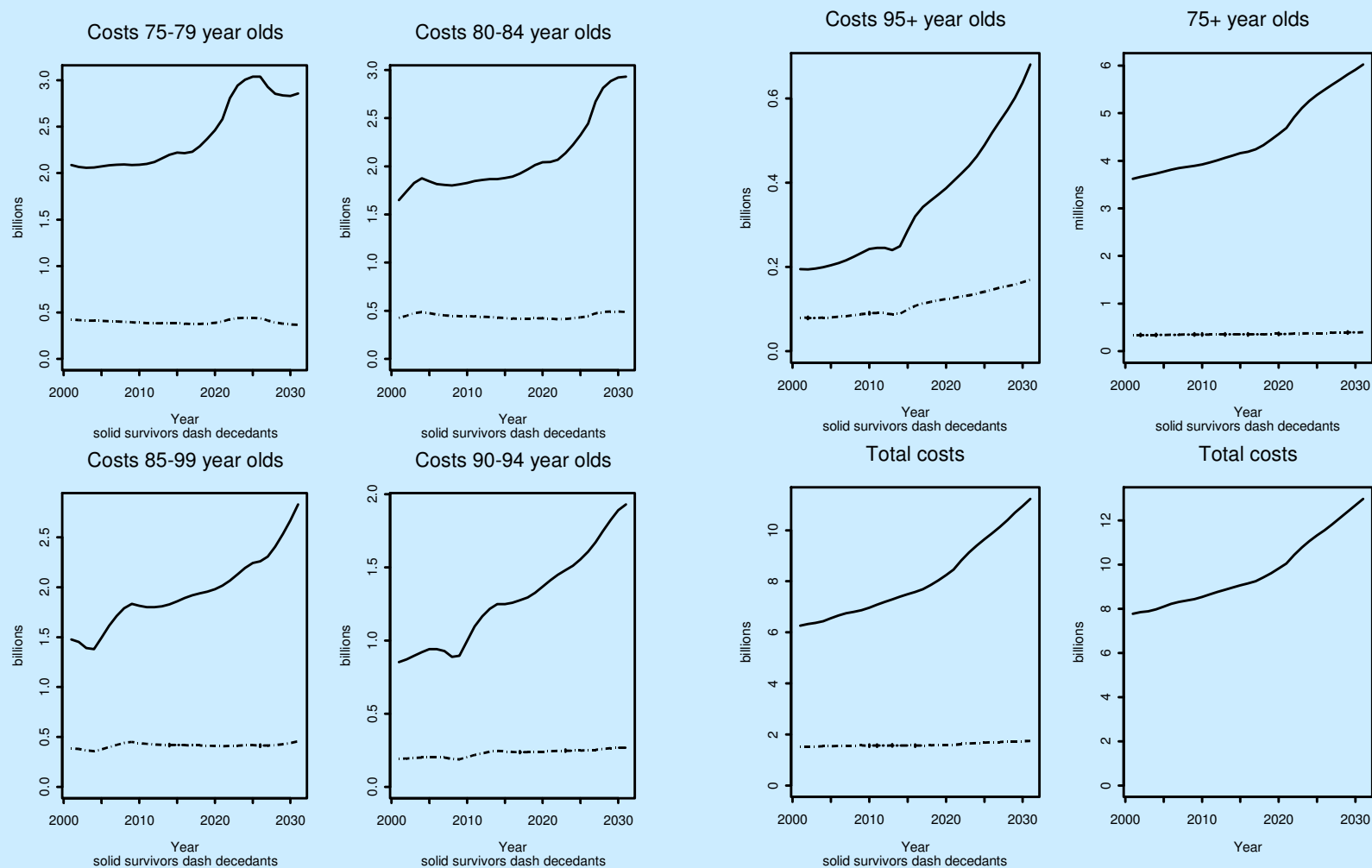
	65-74	75-84	85+
Non-terminal year	5719	7832	13895
Last year of life	37043	38529	36985

# Projections of National Long-term Care Expenditures for the Elderly: US

Year	Billion Dollars (2000 levels)
2000	123
2020	207
2030	295
2040	346

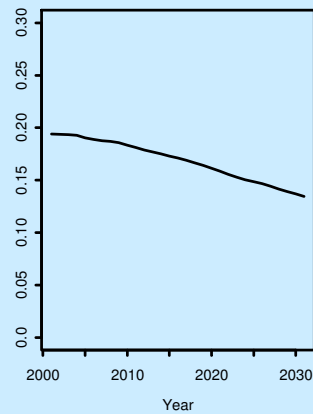
Source: "Projections of expenditures for long-term care services for the elderly," CBO 1999.

# Estimated costs by age & survivor status (illustrative)

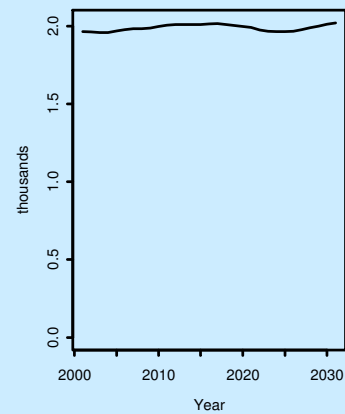


# Changing role of decedants

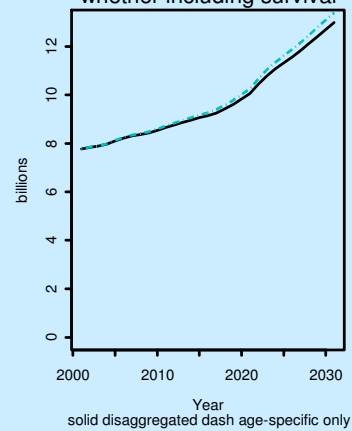
Proportion costs for decedants



Average per caput expenditure



Total costs by whether including survival



**Future demand for long-term care in the UK:  
A summary of projections of  
long-term care finance for older people to  
2051**

(Wittenberg et al Sept 2004)

Long-term care expenditure in the UK would need to rise by around 317 per cent in real terms between 2000 and 2051 to meet demographic pressures and allow for real rises in care costs of 1 per cent per year for social care and 1.5 per cent per year for health care (central base case assumptions - £12.9 billion to £53.9 billion).

## **Relying on informal care in the new century? Informal care for elderly people in England to 2031. (Pickard L et al. 2000)**

- These [1996 marital status] projections yield unexpected results in that they indicate that more elderly people are likely to receive informal care than previously projected.
- The underlying reason is that the GAD figures project a fall in the number of widows and rise in the number of elderly women with partners.
- What this implies is that ‘spouse carers’ are likely to be increasingly important in the coming years.

# Conclusions

- Proximity to death
  - Specific to acute care
  - Sensitive to relativities (e.g. UK/Denmark)
  - ‘trade-off’ with increased years spent in older age groups
  - Highly sensitive to context
  - Possible NOT a dominant driver

# Conclusions (contd)

- Kin availability
  - Situation likely to be relatively benign for next 30 years or so

## Data for Use of Long-term care (LTC) before death in Finland.

The data set includes 301,263 observations of people alive at the start of 2003 who were aged 65 & over at end-1997, and sum of all days spent in hospital (overnight hospital stays or day surgery) and long term care (nursing home care and rehabilitation care) up to six years prior to death in 2003 or by end of follow up period if alive then.

# Work in progress

- Few countries have good data on LTC (and sometimes on joint use of community and hospital facilities – incompatible record systems, confidentiality issues regarding linkage of records etc)
- Some countries have good integrated longitudinal record systems such as Finland

# Data for Use of Long-term care (LTC) before death.

40% sample of elderly in Finland aged 65+ with a baseline at 31.12.1997 followed until the end of 2003 containing:

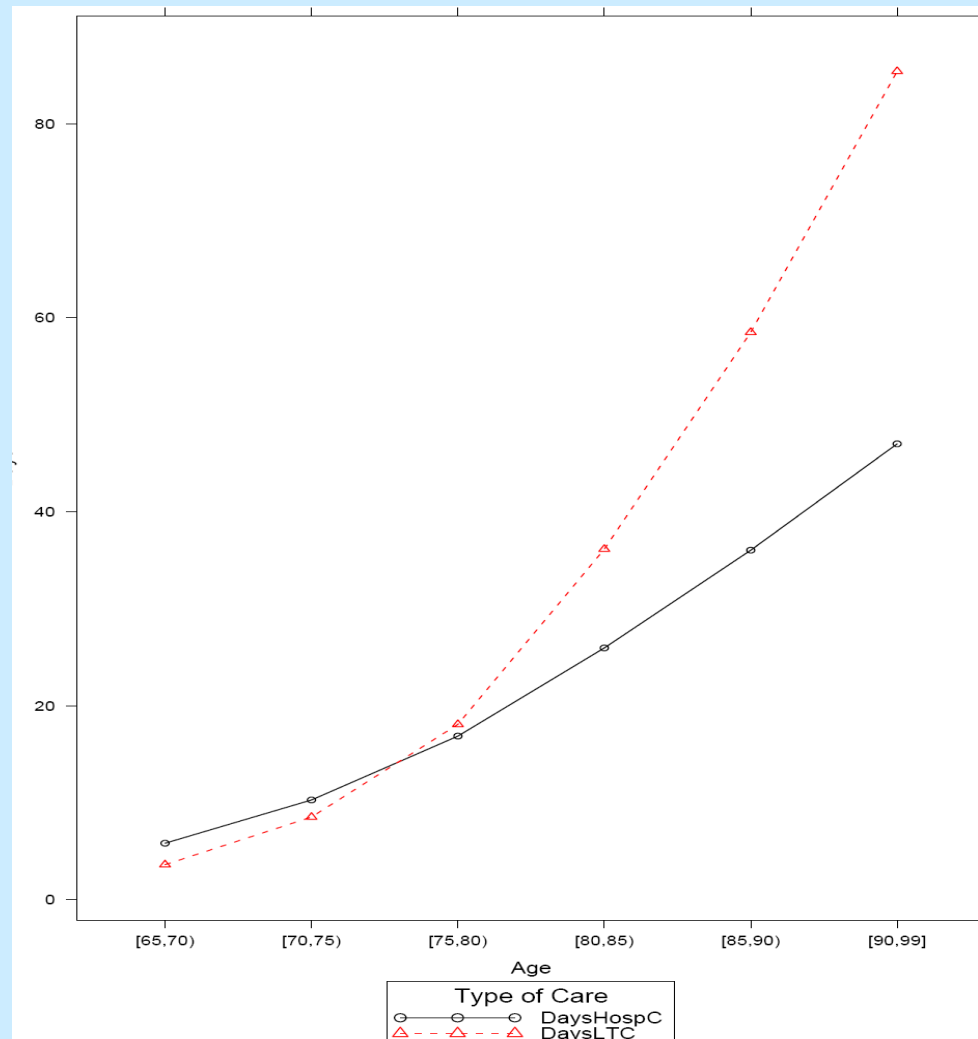
- Age at baseline
- Sex
- Education 1997
- Social class 1995
- Marital status 1997
- Living arrangement 1997
- Date of death of spouse
- Statistical underlying cause of death in the time series
- Date of death
- Number of days in hospital in <period> before death (died in 2003) or end of follow-up (end of 2003)
- Number of days in long-term care in <period> before death (died in 2003) or end of follow-up (end of 2003)

# Windows of use of services

<period> include windows before death (died in 2003) or end of follow-up (end of 2003)

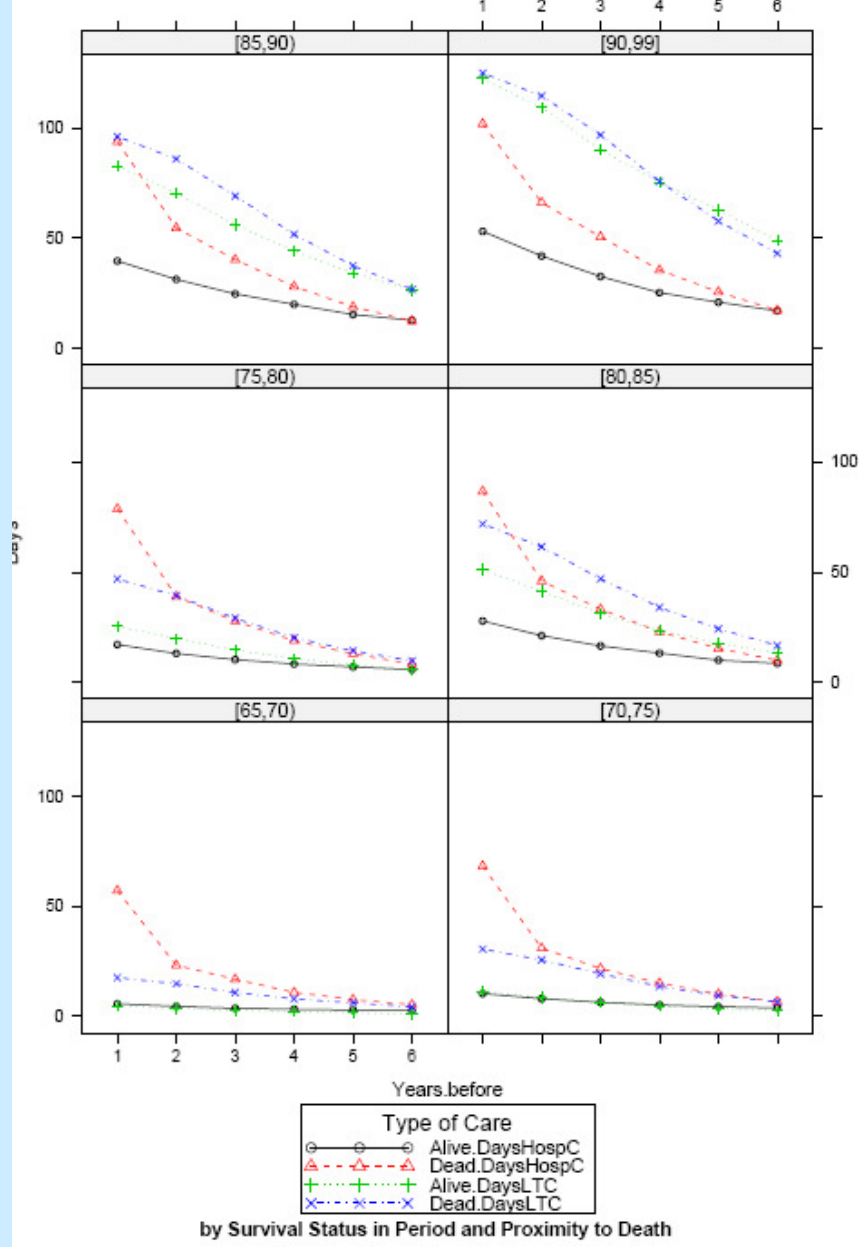
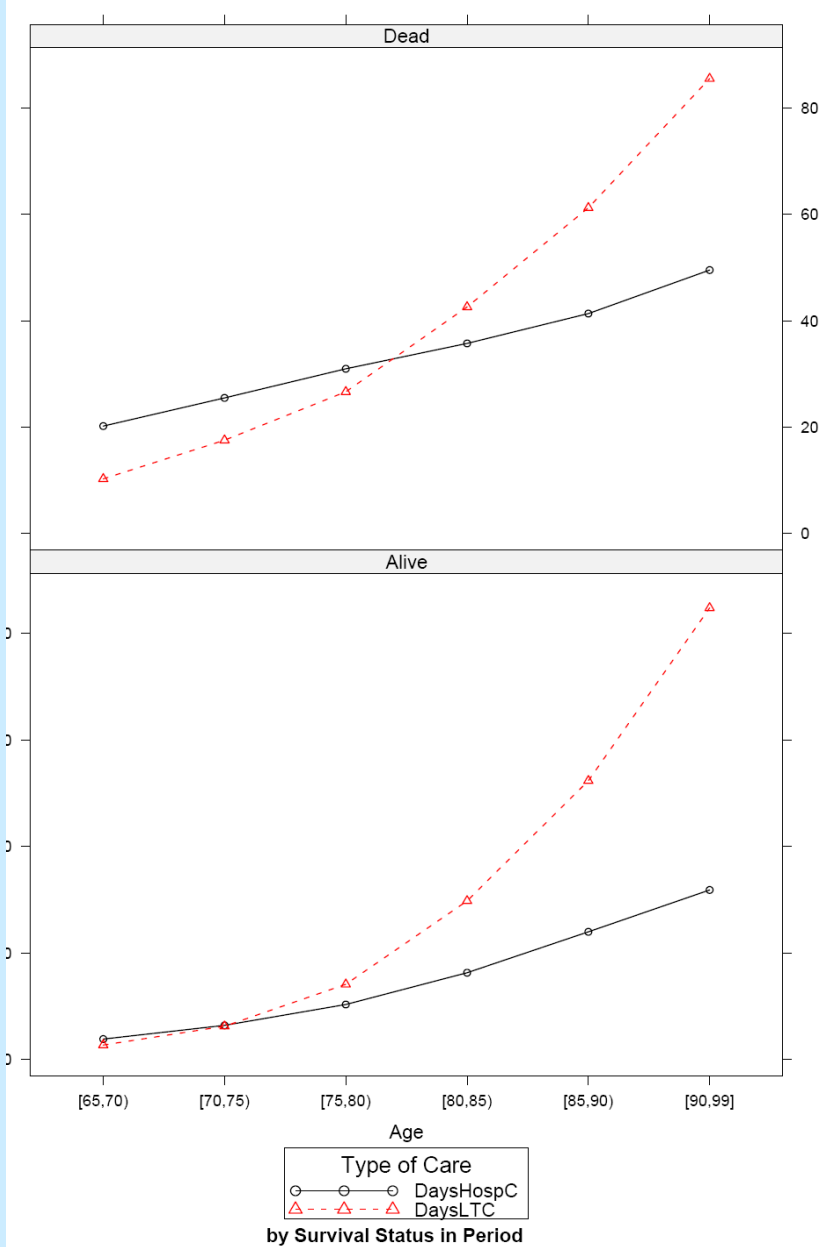
- 0-3 months
- 4-6 months
- 7-9 months
- 10-12 months
- 13-18 months
- 19-24 months
- in the 3rd year (i.e. in 2001 for survivors at end 2003, or N months earlier if death occurred N months before the end of 2003)
- in the 4th year
- in the 5th year
- in the 6th year

# Average Number of Days in Hospital/LTC, Finland 1997–2003

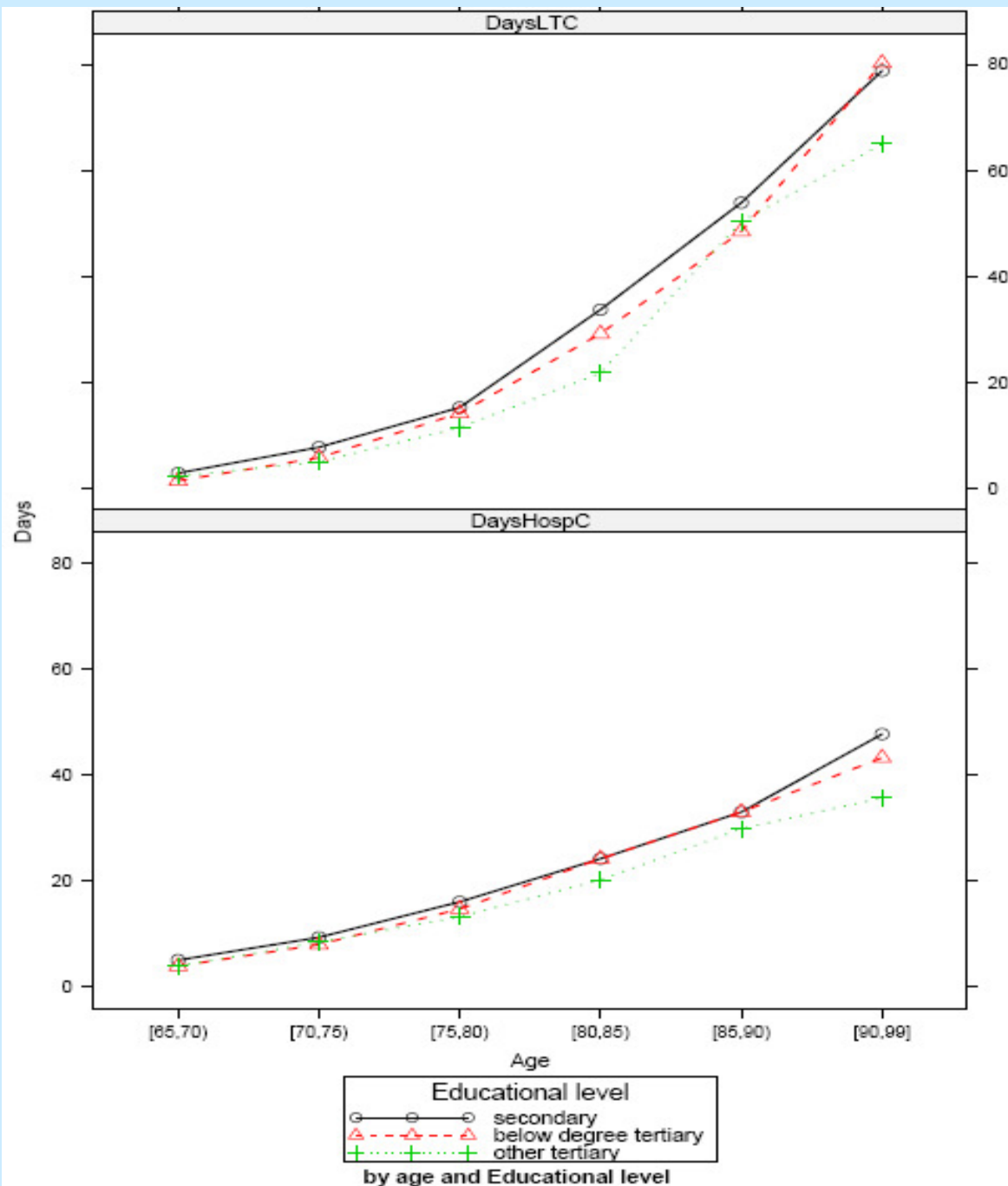


# Average Number of Days in Hospital/LTC, Finland 1997–2003

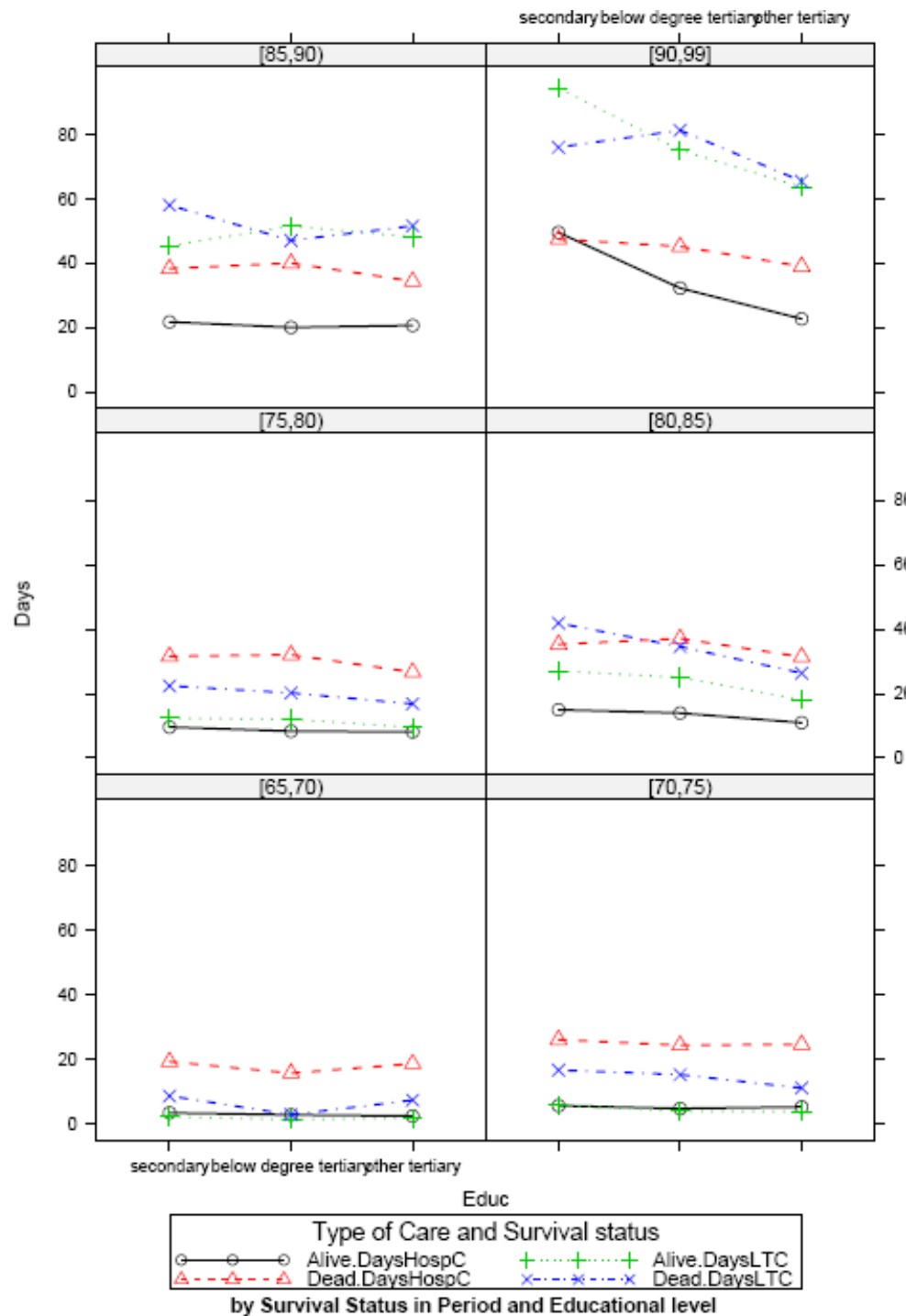
## by (a) Survival status in 2003 (b) Proximity to death



**Average  
Number of  
Days in  
Hospital/LTC,  
Finland  
1997–2003 by  
Age and  
Educational  
Level in 1997**



# Average Number of Days in Hospital/LTC, Finland 1997–2003 by Age, Educational Level in 1997 and Survival status



# Conclusions

- Proximity to death is important for acute care, but age is n=more important for long-term care
- Socio-economic differentials (eg by education level) are relatively modes compared with age
- The population will age considerably in future decades, especially for the oldest-old from about 25 years time

# Key References

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# Further References

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- Derek Wanless with Julien Forder, Jose-Luis Fernandez, Teresa Poole, Lucinda Beesley, Melanie Henwood, and Francesco Moscone (2006) *Securing Good Care for Older People Taking A Long-term View*. available at [http://www.kingsfund.org.uk/publications/kings\\_fund\\_publications/securing\\_good.html](http://www.kingsfund.org.uk/publications/kings_fund_publications/securing_good.html)
- Wittenberg, R., A. Comas-Herrera, L. Pickard, and R. Hancock (2004) *Future demand for long-term care in the UK: A summary of projections of long-term care finance for older people to 2051*. Joseph Rowntree Foundation (pdf: available at [www.jrf.org.uk](http://www.jrf.org.uk))