THE AGEING POPULATION AND THE CHALLENGE OF LONGEVITY

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Demographic Ageing

- record low fertility
- steadily increasing expectation of life
- baby boomer bulge in some countries
- sharply deteriorating dependency ratios
- ageing working population
- increasing numbers of very elderly
Total Period Fertility Rates, 1960-2010

- UK
- USA
- Germany
- France
- Italy
- Singapore
- Japan
- Russia
- China
Average Achieved Family Size for UK Cohorts Born 1945-1980
Expecation of Life for Males, 1950-2020

- UK
- USA
- Germany
- France
- Italy
- Singapore
- Japan
- Russia
- China
Expectation of Life for Females, 1950-2020

- UK
- USA
- Germany
- France
- Italy
- Singapore
- Japan
- Russia
- China
Expectation of Life for Persons, 1960-2000

- Japan
- China
- Hong Kong
- South Korea
- Taiwan
- Singapore
Dependency Ratios, 1970-2030
(nos. 65 & over per 1000 aged 15-64)
Percentage increase in numbers aged 65 & over, 1990-2030

% increase in nos. aged 65 & over
Expectation of life at birth according to death rates experienced in given years, United Kingdom, 1911-2004
Proportion of persons surviving to successive ages, according to death rates experienced or projected, England & Wales, 1851-2051
Annual improvement in smoothed mortality rates – Males, UK
Male, % improvement factors in graduated age specific mortality rates, CMIB Assured Lives experience.
Japanese experience

Pace of mortality improvement for Japanese females by age and calendar year – shaded area shows where change is most rapid

- Age 85
  - 4.0% p.a. improvements at age 85
- Age 75
  - 4.25% p.a. improvements at age 75
- Age 65
  - 4.5% p.a. improvements at age 65
- Age 55
  - 3.5% p.a. improvements at age 55

Source: calculations using data from www.mortality.org
Annual improvement in smoothed mortality rates, Males, UK
## Male mortality by major cause, England & Wales, 1911-2002

Age standardised mortality rates for selected broad disease groups

<table>
<thead>
<tr>
<th>Year</th>
<th>Infectious diseases</th>
<th>Respiratory diseases</th>
<th>Cancers</th>
<th>Circulatory diseases</th>
</tr>
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<tbody>
<tr>
<td>1911</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1921</td>
<td></td>
<td>1000</td>
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<tr>
<td>2001</td>
<td></td>
<td>200</td>
<td></td>
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</tr>
</tbody>
</table>

Source: ONS
Female mortality by major cause, England & Wales, 1911-2002

Age standardised mortality rates for selected broad disease groups

Source: ONS
Expectation of life at birth according to the mortality rates experienced or projected for cohorts, England & Wales
Expectation of life at 65 according to the mortality rates experienced or projected for cohorts, England & Wales.
## Period & cohort life expectancy

2004 period and cohort life expectancy at various ages, United Kingdom

<table>
<thead>
<tr>
<th>age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>period</td>
<td>cohort</td>
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<tr>
<td>0</td>
<td>76.7</td>
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<tr>
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<td>19.2</td>
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<td>80</td>
<td>7.5</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Average number of additional years a person of age x can expect to live:

a) according to the mortality rates for 2004;
b) according to projected mortality rates
Potential drivers for future mortality change

- Reduced levels of deprivation, better housing etc (+)
- Govt support for increasing wealth, health and incomes (+)
- Public support for spending on medical advances (+)
- Decline in smoking prevalence (+)
- Lifestyles (+ and -)
- Obesity (-)
- Emergence of new diseases (eg HIV, SARS) (-)
- Re-emergence of old diseases (eg TB) (-)
- Wide spread of opinion as to whether future technical, medical and environmental changes will have greater or lesser impact than in the past
Infectious diseases - a growing threat?

- rapid global transport, especially air travel (SARS)
- increasing use of antibacterials in medicine & veterinary science
- increasing industrialisation of food production
- human behaviour (unprotected sex and drug use)
- potential threat of bioterrorism
General points

• advances in medicine and international networking will continue to help limit the effects of new diseases (SARS is a good example)
• HIV is the only infectious agent to emerge recently to have a dramatic impact on global mortality.
• the potential threat of infectious diseases cannot be disregarded (avian flu, etc.)
• as deaths from heart disease and cancer reduce in future decades the relative impact of deaths from infectious diseases may become more significant
Some Reflections

- increasing proportion of elderly…
- …particularly very elderly
- average age at death increasing
- expectation of life at retirement age rising fast
- rate of improvement faster than expected
- some cohorts experiencing it even faster
- projecting forward is a hazardous business
Pensioners & Annuitants

• greater longevity increases costs
• use of population mortality is dangerous
• mortality highly dependent on covered group
• … whether mandatory or voluntary
• … and options, e.g. programmed withdrawal
• projecting mortality is difficult but essential
• risk margin needed for pricing…
• …more prudent margins needed for reserving
2004-based national population projections
United Kingdom

Population (thousands)

Age

Males

Females

Population (thousands)
2004-based national population projections
United Kingdom
2004-based national population projections
United Kingdom

Population (thousands)

Age

Males
Females
2004-based national population projections
United Kingdom

2061
Proportion of the population aged 65 and over, United Kingdom, 1981-2074, under various projection assumptions.
Population pyramid for 2000, PRC
Population pyramid for 2050, PRC
Singapore 1960

[Diagram showing the population distribution by gender with the y-axis representing the population in thousands and the x-axis representing the age groups from -200,000 to 200,000.]
Singapore 1980
Singapore 2003
Population Pyramid for Singapore (2030)

Source: U.S. Census Bureau, International Data Base.
Japan 2003

The graph shows the population distribution in Japan in 2003, categorized by gender. The x-axis represents the population size, ranging from -7,500,000 to 7,500,000, while the y-axis shows the frequency. The pink bars represent females, and the blue bars represent males.
Australia 2002
Thailand 2002
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