

Tower 42, Old Broad Street, London

Challenges for cause-of-death projections

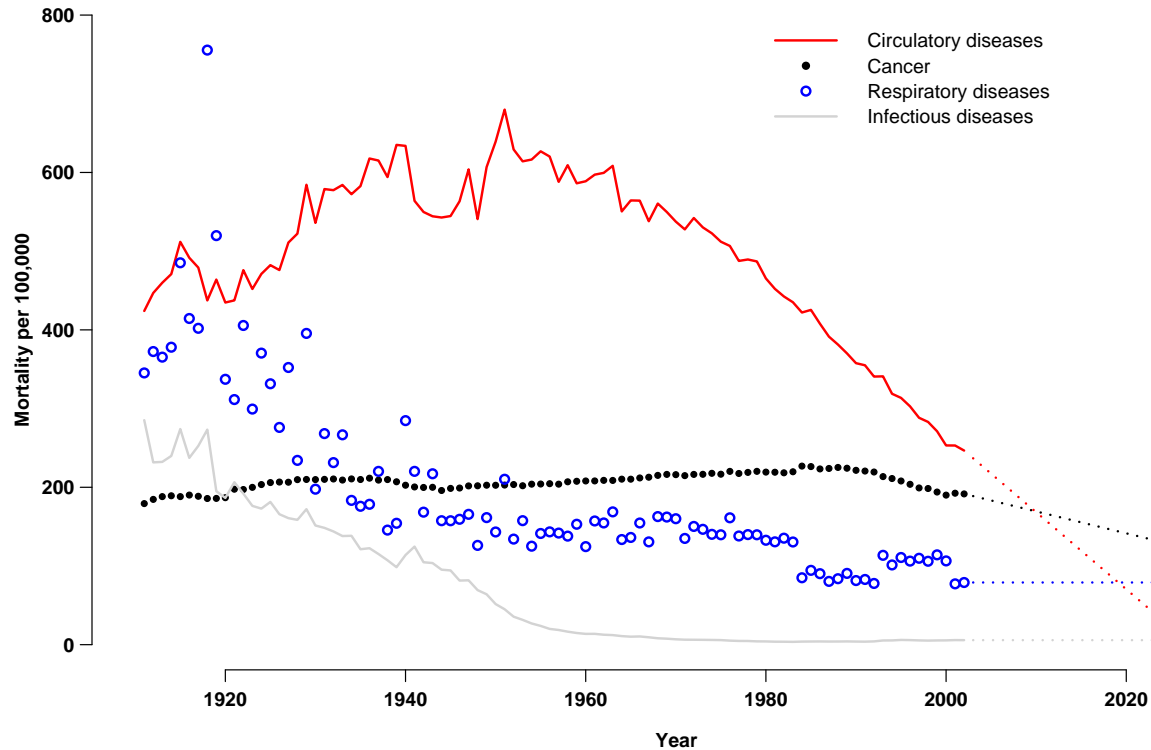
Stephen Richards

18th May 2010

Benefits of using cause-of-death data

- Insight into past patterns

Mortality rates by broad cause groups



Source: ONS data for England and Wales.

Some challenges in using cause-of-death data

- Subjective simplification of thousands of codes into a few broad groups
- Changing classification systems: ICD-1 to ICD-10 in past century
- Changing classification guidelines *within* a system

Changing causes

1979	2000	Description
23.7% (1)	13.1% (1)	Acute myocardial infarction
9.9% (2)	9.7% (2)	Malignant neoplasm of trachea, bronchus and lung, unspecified
5.7% (3)	4.1% (5)	Bronchopneumonia, organism unspecified
5.1% (4)	4.0% (6)	Acute but ill-defined cerebrovascular disease
3.8% (5)	8.3% (3)	Other forms of chronic ischaemic heart disease — unspecified
3.5% (6)	5.1% (4)	Other forms of chronic ischaemic heart disease — coronary atherosclerosis

Source: Frequency of top six causes of death cited for males aged 70-74 in England and Wales, [20th Century Mortality](#)

Changing causes

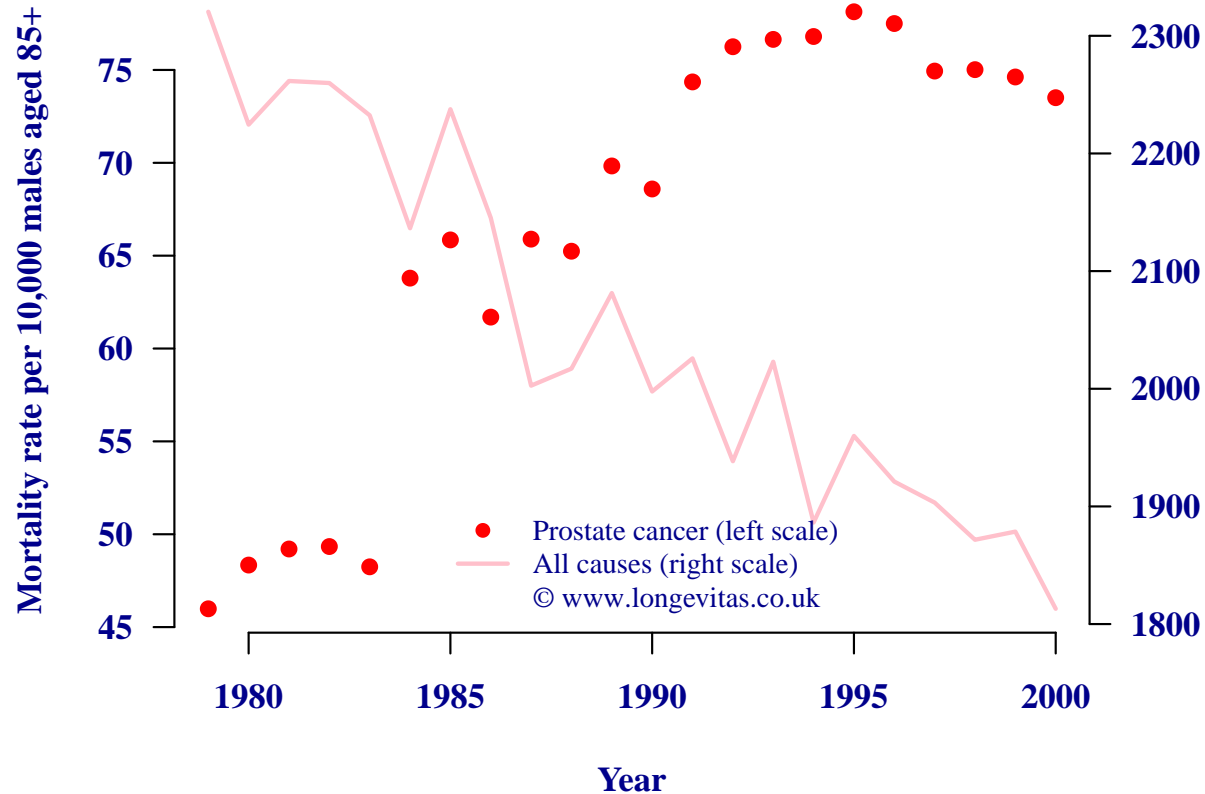
“Trend analysis spanning the years either side of 1984 and 1993, must take into account some important coding changes. There is a large increase in mortality from chronic diseases [...] between 1984 and 1993. This is an artefact due to changes in the way ICD-9 rules [...] were interpreted in England and Wales. [...] As a result, some deaths for which bronchopneumonia in Part I of the certificate would previously have been coded as the underlying cause of death were coded to a condition mentioned elsewhere in Part I or Part II.”

Dr Paul Aylin, Office for National Statistics

Challenges with cause-of-death data — practical

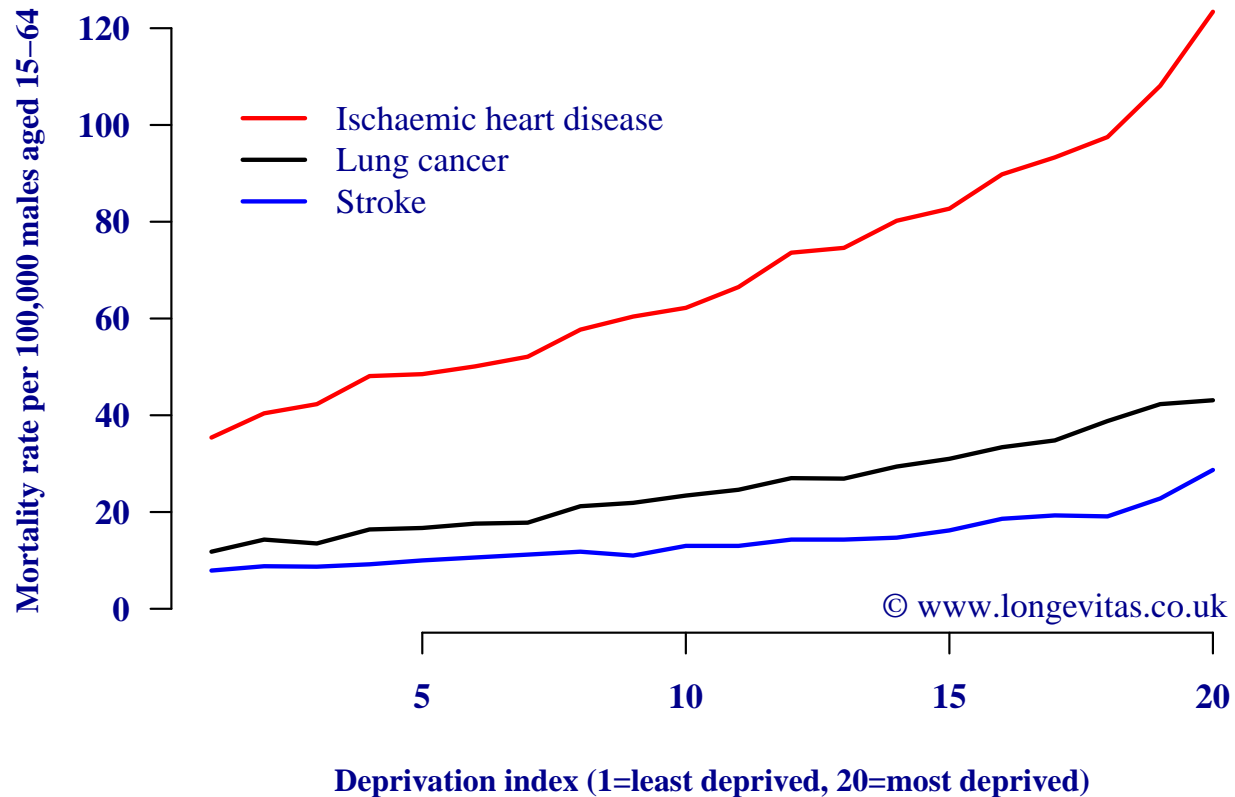
- Projecting correlated time series is difficult
- As general mortality falls, one cause can increase

Mortality rates



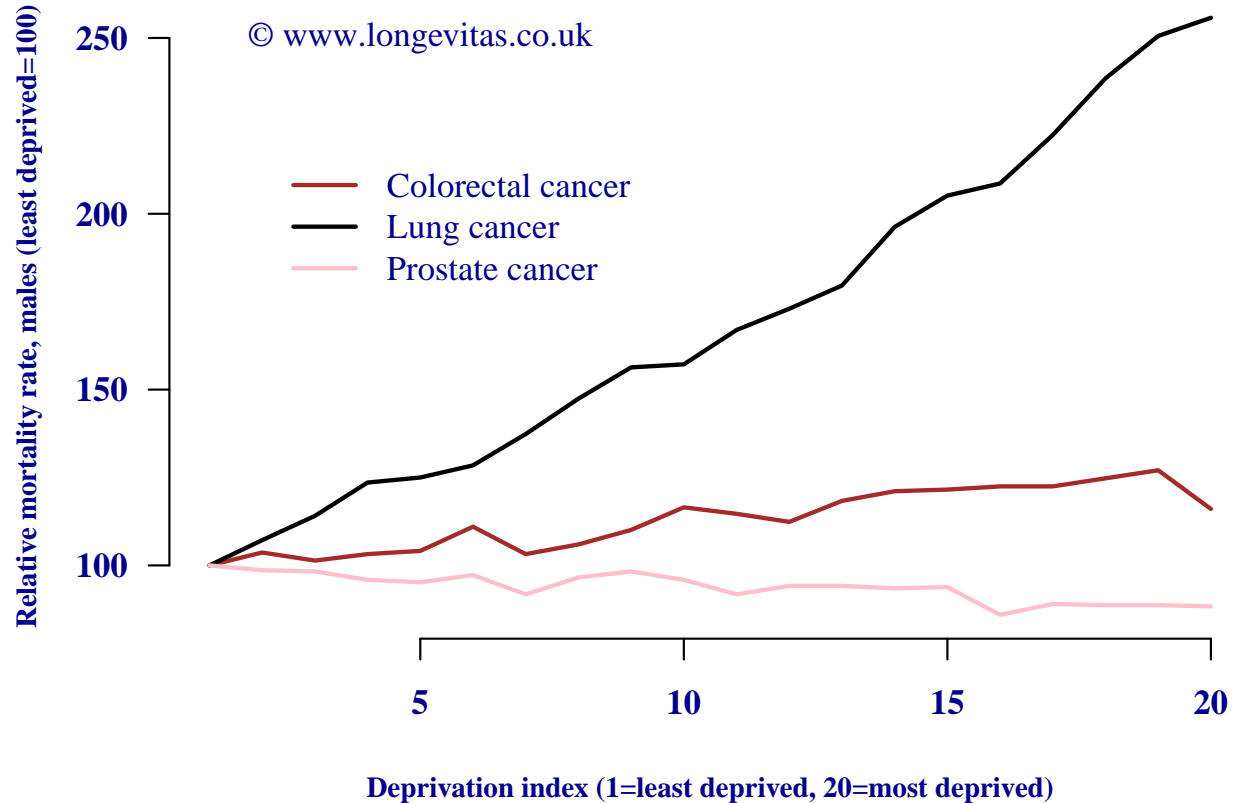
Source: Mortality rates per 10,000 males over age 85 in England and Wales, [20th Century Mortality](#)

Mortality rates by selected cause of death



Source: ONS data for males aged 15-64 in England and Wales.

Relative mortality rates by selected cause of death



Source: Relative mortality rates by selected cause of death for males of all ages in England and Wales (least deprived=100).

Conclusions and questions

- Cause of death data insightful when explaining past changes
- Worries over continuity of classification
- Data limitations: age bands instead of ages
- Forecasts often don't have attached probability needed for Solvency II
- Strong but complicated links between cause and socio-economic group

