

## ■ Stomach cancer

Stomach cancer comprises two distinct sub-types: cancer of the body of the stomach, related to *Helicobacter pylori* infection and the use of salt as a food preservative; and cancer of the oesophago-gastric (OG) junction, related to gastro-oesophageal reflux disease (GORD), and so to obesity (Devesa et al 1998). Deficiencies in sub-type assignment in the historical data prevent separate analysis of sub-types in this report.

Among males stomach cancer incidence rates (sub-types pooled) have declined throughout the study period. The average annual incidence rate fell from 27 per 100,000 in 1956 to reach 15 per 100,000 in 1996. Despite the incidence rate having halved since 1956, the annual number of registrations still increased slightly, from 212 to 239, reflecting the impact on the stomach cancer burden of demographic forces. The historical trend in incidence has been similar among females, but at about half the level of males, falling from 13 per 100,000 in 1956 to 7 per 100,000 in 1996. The annual number of registrations among females nevertheless increased over the period, from 119 to 152.

Survival with stomach cancer is poor (Australian Institute of Health and Welfare 2001b), so it is not surprising that mortality mirrors incidence. The average annual age standardised mortality rate fell from 24 per 100,000 in 1972 to 11 per 100,000 in 1997 among males, and from 11 per 100,000 to 6 per 100,000 among females. Net decreases in the number of stomach cancer deaths for both genders were observed over this period, as the risk reduction outweighed the demographic trend.

These dramatic declines in incidence and mortality of stomach cancer have been seen throughout the industrialised world over the past half century, and are thought to reflect changes in both the risk of infection with *Helicobacter pylori* and in the availability of refrigeration (lessening the need to rely on salt as a food preservative) (Uemura et al 2001). Despite this dramatic improvement, stomach cancer still ranked among the top 10 cancer sites for both incidence and mortality in the late 1990s.

The age distribution of stomach cancer shows a typical ‘cancer’ pattern, with 70% or more of cases and deaths occurring in the older ages.

Stomach cancer demonstrates one of the largest ethnic inequalities of any cancer site, with Māori having two to five times the rates of non-Māori in the late 1990s. This cancer also shows strong direct deprivation gradients, for both incidence and mortality, in both genders (although less clearly for mortality in females).

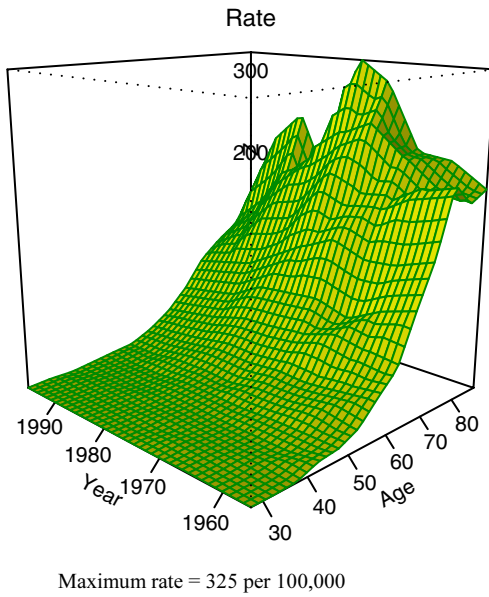
The incidence and mortality rates of stomach cancer are forecast to continue to decline in both genders. Among males the age standardised incidence rate is projected to decline by 25% from 1996 to 12 per 100,000 (CI 9 – 15) in 2011; yet the number of registrations is projected to increase slightly to 254 (CI 188 – 338), as risk reduction is offset by increasing population size and population ageing. The incidence pattern is similar for females: a 19% decrease in rate to 6 per 100,000 (CI 5 – 8) but a small increase in count to 160 registrations (CI 114 – 218).

For mortality we forecast a steeper decline in rate, by about one-third, to 7 per 100,000 (CI 6 – 9) among males and 4 per 100,000 (CI 3 – 5) among females in 2012. While death counts are also projected to decrease, this will be by less than 10%, to 163 (CI 126 – 225) and 108 (CI 78 – 145) deaths among males and females, respectively.

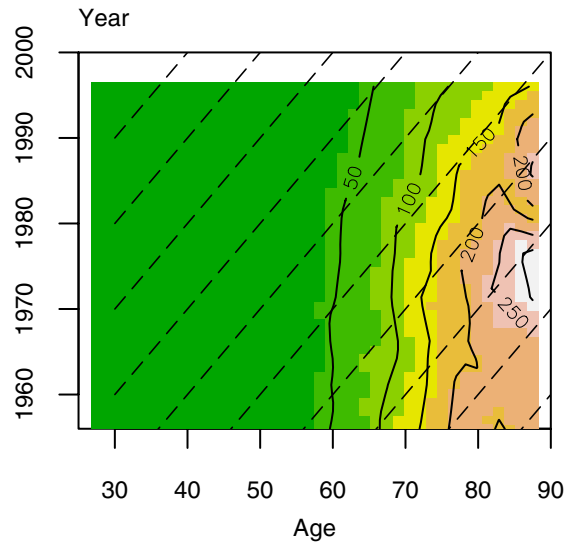
As with oesophageal cancer, these stomach cancer forecasts may not have captured a potential rapid increase in incidence of (and hence mortality from) cancer of the OG junction, which appears to be causally related to GORD and hence may be expected to respond to the emerging obesity epidemic (Devesa et al 1998). Future updates of this report should attempt to examine cancer of the OG junction separately from both cancer of the (upper and middle third of the) oesophagus and cancer of the body of the stomach.

**Figure 31.1** Historical trends in age specific rates, stomach cancer, males

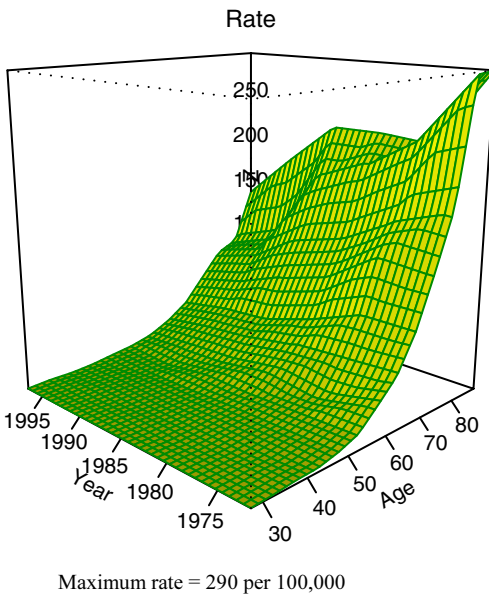
(a) Male incidence rates, perspective plot



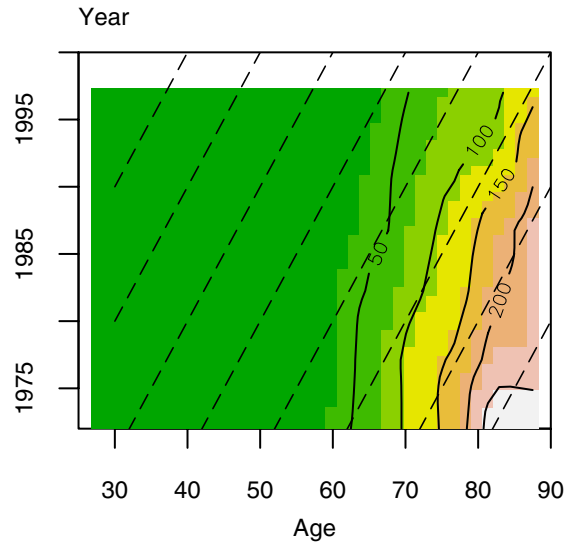
(b) Male incidence rates, contour plot



(c) Male mortality rates, perspective plot



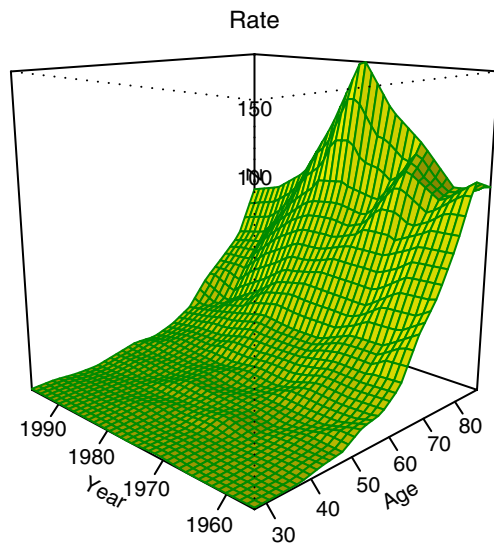
(d) Male mortality rates, contour plot



Please refer to Chapter 2 for interpretation of charts

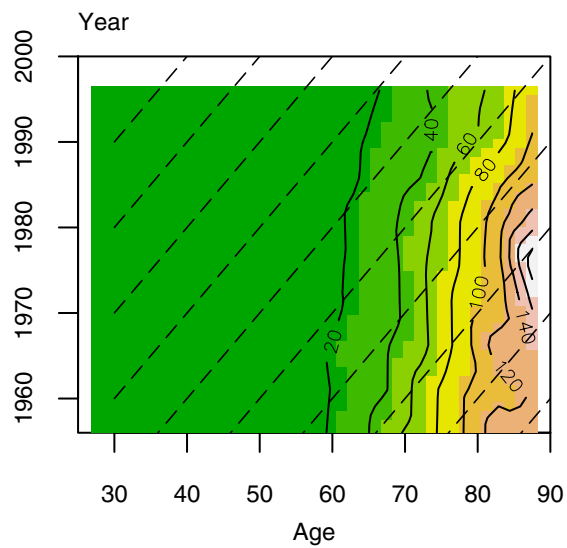
**Figure 31.2** Historical trends in age specific rates, stomach cancer, females

(a) Female incidence rates, perspective plot

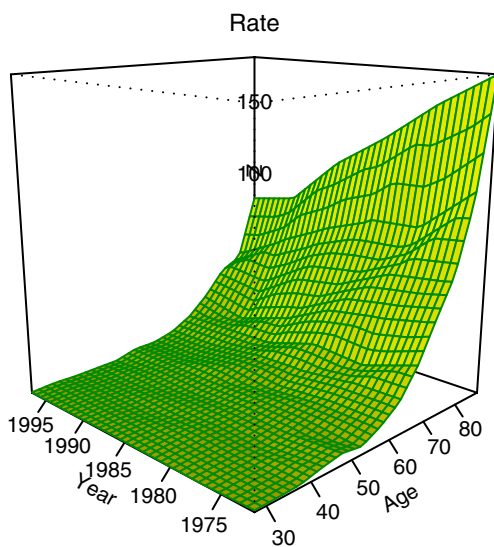


Maximum rate = 193 per 100,000

(b) Female incidence rates, contour plot

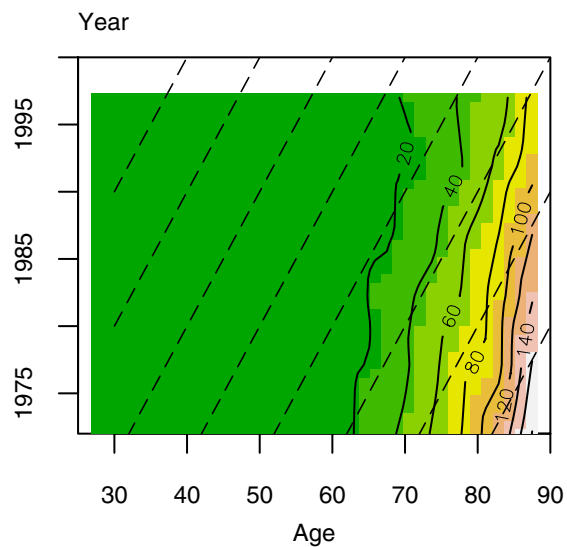


(c) Female mortality rates, perspective plot

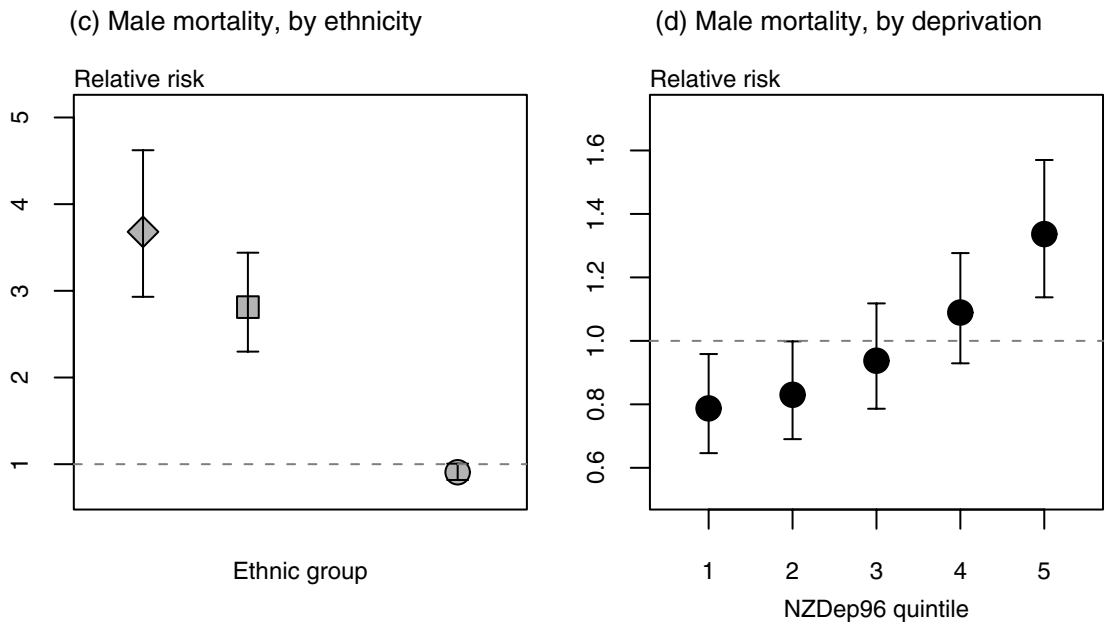
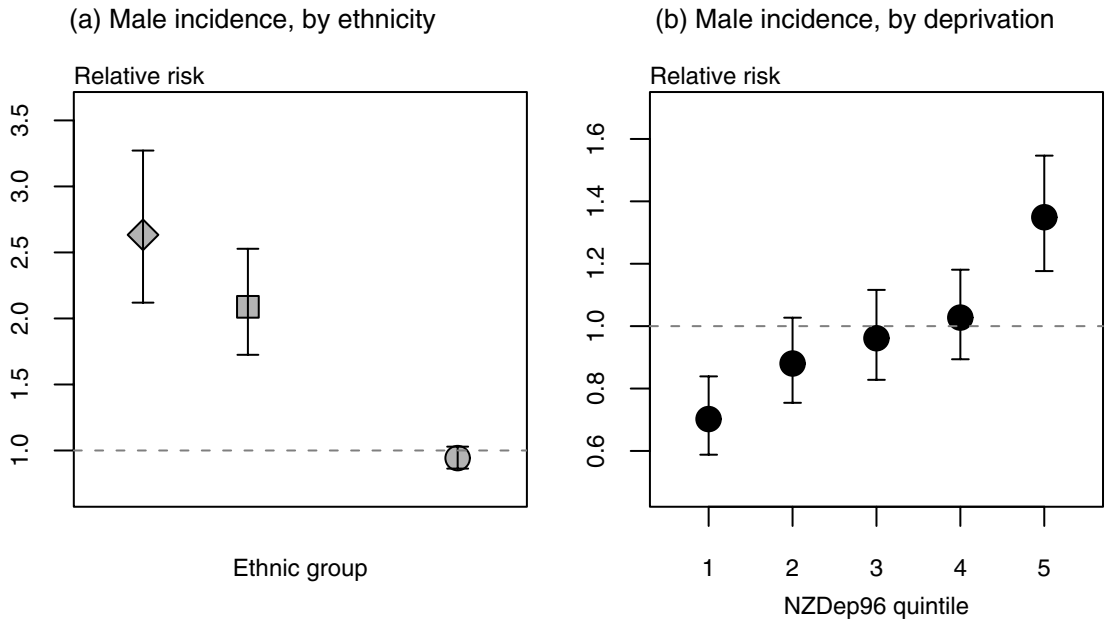


Maximum rate = 181 per 100,000

(d) Female mortality rates, contour plot



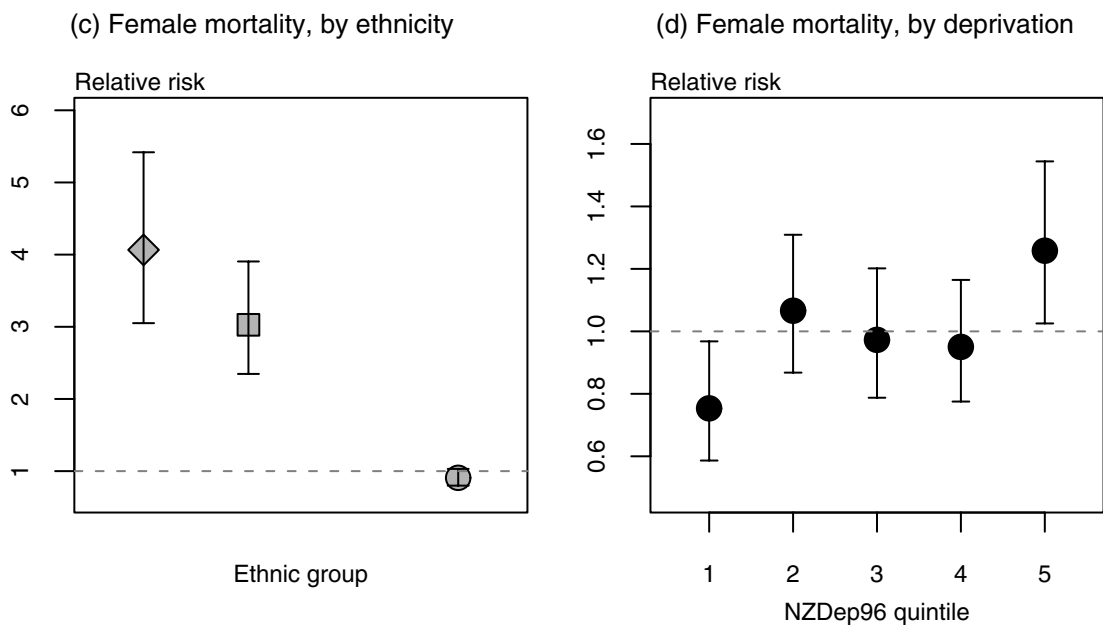
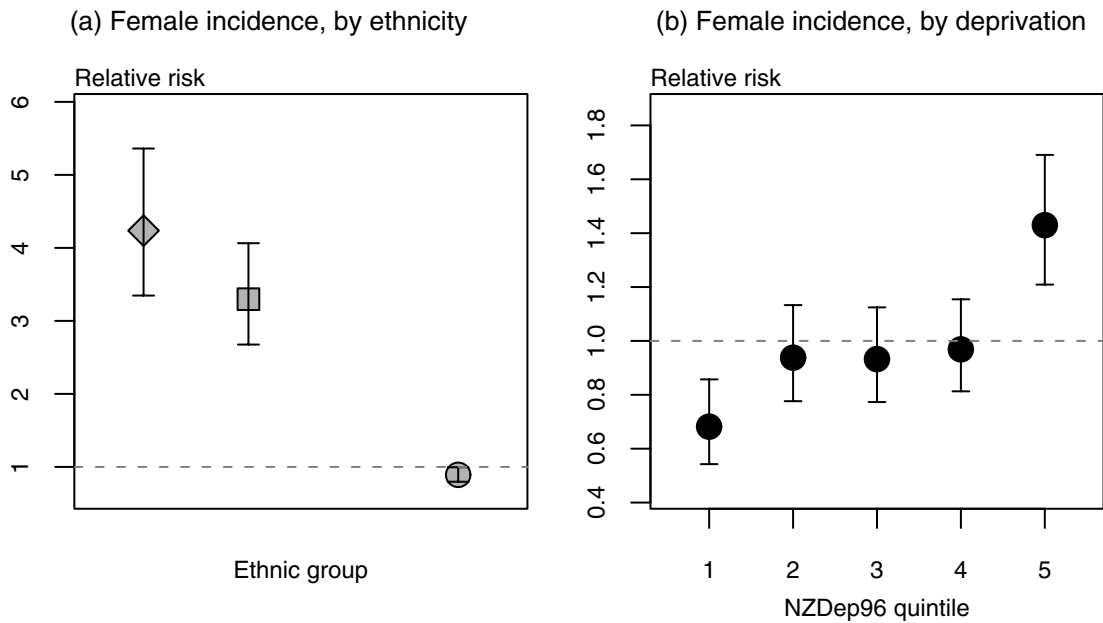
**Figure 31.3** Relative risk 1996/97, stomach cancer, males



Ethnic group key:

- ◆ sole Māori
- total Māori
- non-Māori

**Figure 31.4** Relative risk 1996/97, stomach cancer, females

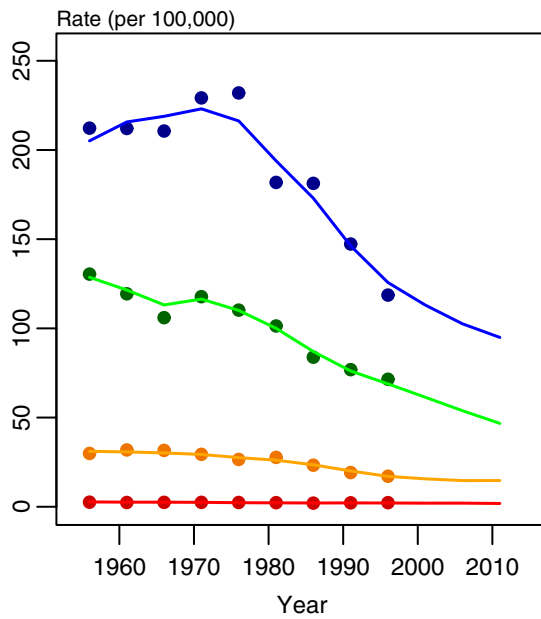


Ethnic group key:

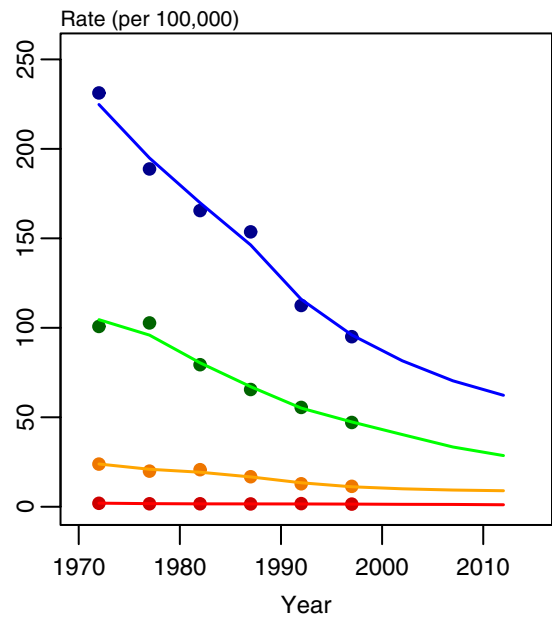
- ◆ sole Māori
- total Māori
- non-Māori

**Figure 31.5** Trends and projections of life cycle stage specific rates, stomach cancer

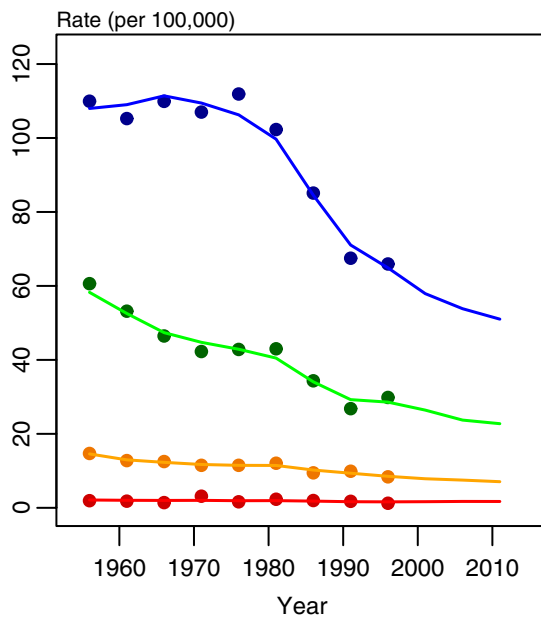
(a) Male incidence rates



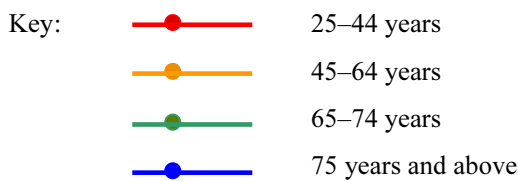
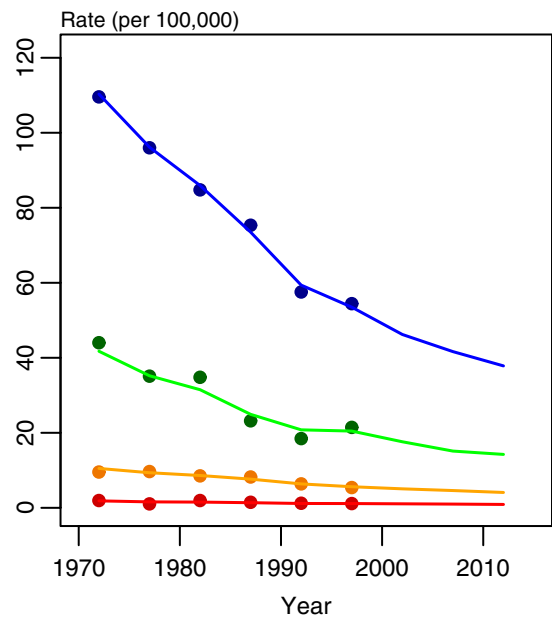
(b) Male mortality rates



(c) Female incidence rates

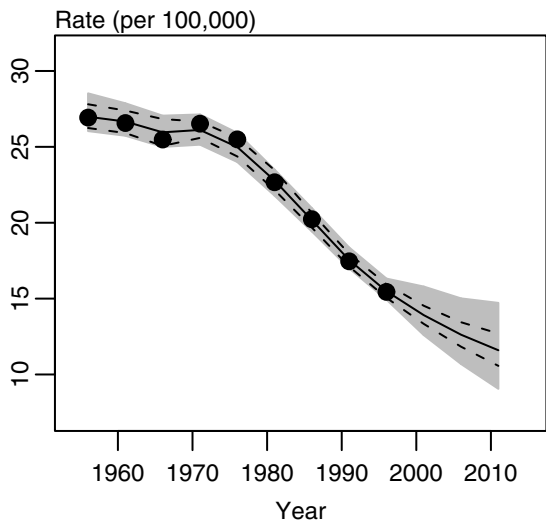


(d) Female mortality rates

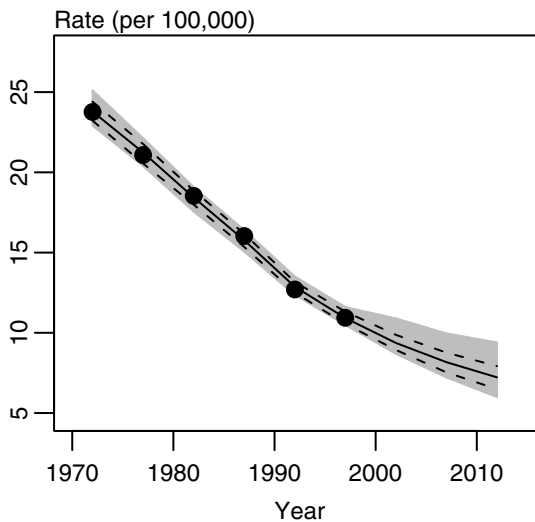


**Figure 31.6** Trends and projections of age standardised rates, stomach cancer

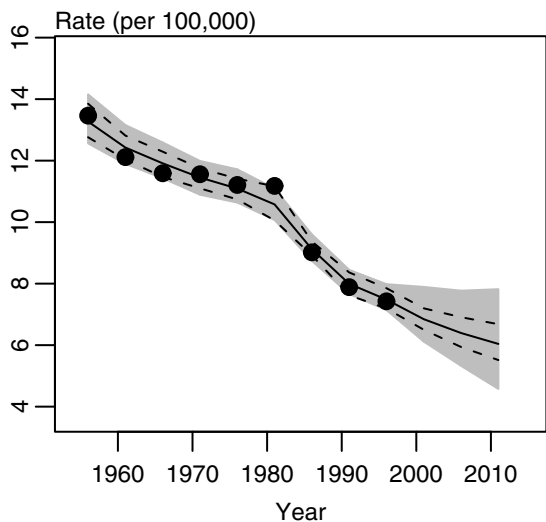
(a) Male incidence rates



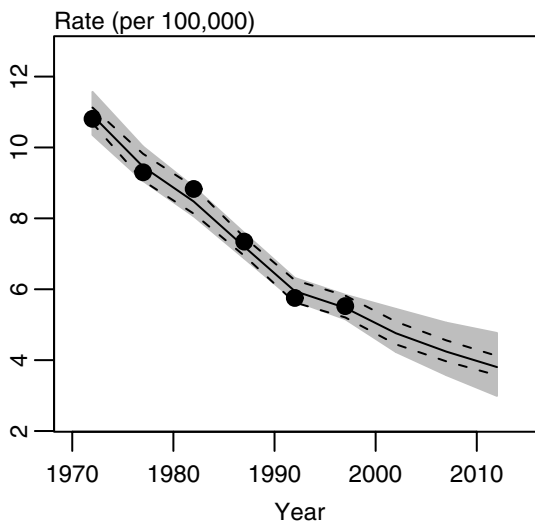
(b) Male mortality rates



(c) Female incidence rates



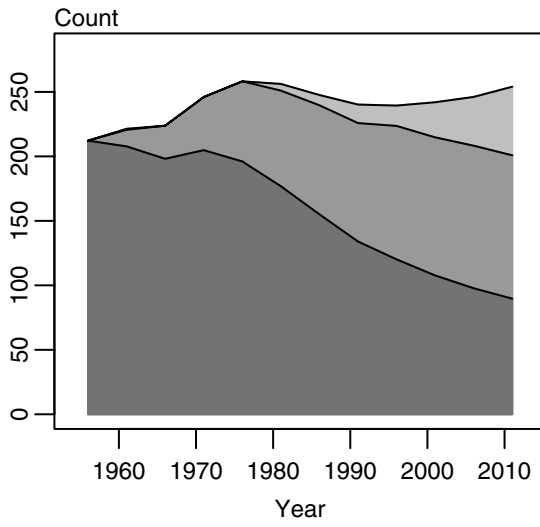
(d) Female mortality rates



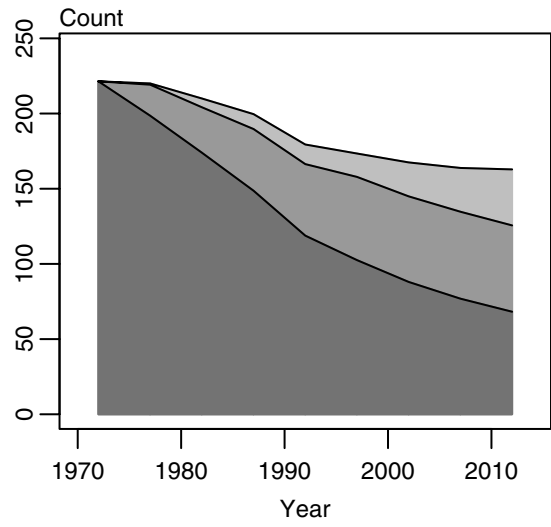
- Key:
- Observed
  - Fitted and projected
  - - Minimum and maximum estimates
  - 90% Bayesian credible interval

**Figure 31.7** Drivers of change in the cancer burden, stomach cancer

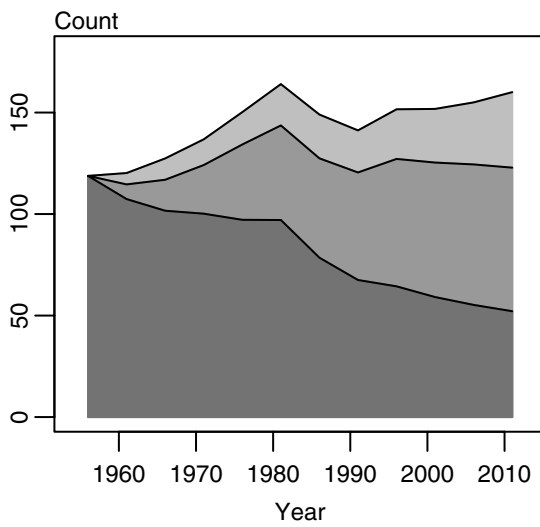
(a) Male registrations



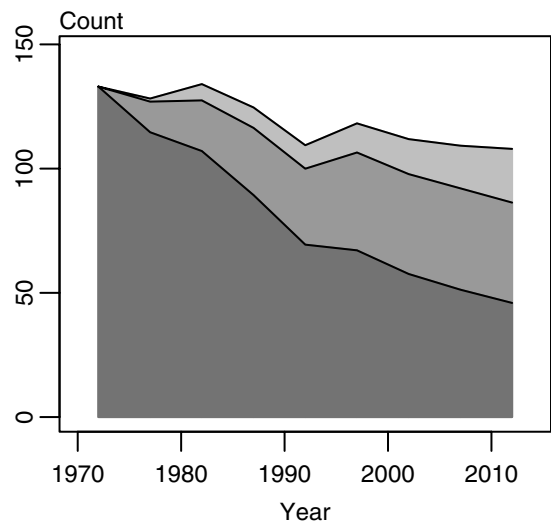
(b) Male deaths



(c) Female registrations



(d) Female deaths



Key:   
 Risk effect   
 Population size effect   
 Population ageing effect

**Table 31.1** Key results, stomach cancer

## Males

	Incidence			Mortality		
	1996	2011 (CI)	change (%)	1997	2012 (CI)	change (%)
<i>Age standardised or age specific rate (per 100,000)</i>						
15+	15	12 (9 – 15)	-25	11	7 (6 – 9)	-34
25–44	2	2 (1 – 3)	-	2	1 (1 – 2)	-
45–64	17	15 (11 – 20)	-14	11	9 (7 – 12)	-22
65+	89	66 (50 – 88)	-25	65	42 (34 – 58)	-35
<i>Number of cases</i>						
15+	239	254 (188 – 338)	6	173	163 (126 – 225)	-6
25–44	13	10 (6 – 14)	-23	8	6 (4 – 9)	-25
45–64	63	79 (58 – 105)	25	43	49 (35 – 66)	14
65+	163	165 (124 – 219)	1	122	108 (87 – 150)	-12

## Females

	Incidence			Mortality		
	1996	2011 (CI)	change (%)	1997	2012 (CI)	change (%)
<i>Age standardised or age specific rate (per 100,000)</i>						
15+	7	6 (5 – 8)	-19	6	4 (3 – 5)	-
25–44	1	2 (1 – 2)	-	1	1 (1 – 1)	-
45–64	8	7 (5 – 10)	-16	5	4 (3 – 6)	-
65+	47	36 (26 – 49)	-22	37	25 (19 – 34)	-32
<i>Number of cases</i>						
15+	152	160 (114 – 218)	5	118	108 (78 – 145)	-8
25–44	7	10 (5 – 13)	43	7	5 (3 – 7)	-29
45–64	31	39 (29 – 57)	26	21	23 (17 – 32)	10
65+	113	111 (80 – 149)	-2	91	80 (59 – 106)	-12

CI = 90% Bayesian credible interval

Percentage change omitted when estimate is not robust because of small numbers.