

## ■ Bladder cancer

The major causes of bladder cancer are thought to be tobacco smoking and occupational chemical exposure in the rubber, organic dye, metal refining, petrochemical and paint industries (Department of Health 2000). The aetiology of many cases is unknown.

Over the period 1956 to 1996 the average annual age standardised incidence rate of bladder cancer increased by more than 150%, from 10 per 100,000 to 26 per 100,000 among males, and from 3 per 100,000 to 7 per 100,000 among females. Over the same period the absolute number of annual registrations increased more than five-fold, from 77 to 398 registrations among males and from 24 to 144 registrations among females. The increasing risk of bladder cancer over the 40 year period was responsible for only approximately one-third of the increase in the number of registrations (both genders), with the remainder of the increase in burden being explained by demographic trends (mainly the increase that occurred in population size).

By contrast, mortality from bladder cancer has shown a steadily decreasing trend over the historical period. The average annual age standardised mortality rate decreased from 9 per 100,000 (80 deaths) in 1972 to 7 per 100,000 (113 deaths) in 1997 among males, and from 3 per 100,000 (34 deaths) to 2 per 100,000 (54 deaths) among females. Note that despite the declining mortality risk, the absolute number of deaths due to bladder cancer still increased over the observation period in both genders.

The diverging trend in incidence and mortality rates most probably reflects an improvement in bladder cancer survival. However, overseas studies suggest that an increasing tendency to record papillomas of uncertain behaviour as invasive may also partly explain the widening incidence–mortality difference (Aitchison 2001a).

The incidence of bladder cancer at 65 years and above is nearly six times higher than at 45–64 years, and mortality is 12 times higher in the older age group. As a result, nearly three-quarters of all bladder cancer registrations and 85% of all bladder cancer deaths in 1996/97 occurred at 65 years and above.

Male excess risk for bladder cancer is pronounced, with incidence rates for males typically three-fold or greater than those for females.

After controlling for age, bladder cancer incidence rates in the mid to late 1990s were noticeably lower for Māori than for non-Māori, particularly among males. However, this may be at least partly caused by undercounting of Māori ethnicity in cancer registrations. Deprivation gradients in risk across socioeconomic groups (NZDep96 quintiles) are not apparent, perhaps because of the relatively small numbers involved.

The age standardised incidence rate of bladder cancer is forecast to continue to increase to 2011, reaching 34 per 100,000 (CI 21 – 50) or 754 registrations (CI 444 - 1135) for males and 11 per 100,000 (CI 8 – 13) or 284 registrations (CI 193 – 369) for females. With regard to the absolute number of registrations, the majority of the projected increase will reflect the impact of demographic forces: the anticipated growth in the size of the

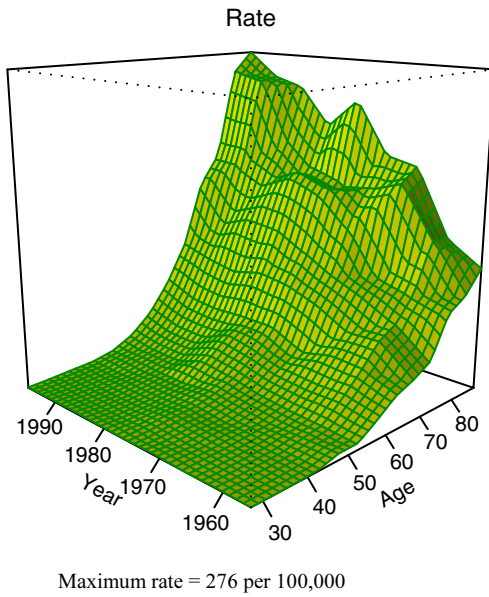
population and, increasingly, the structural ageing the population is expected to undergo over the forecasting period (and beyond).

Over the same period (1997 to 2012), the age standardised bladder cancer mortality rate is projected to decrease, to 5 per 100,000 (CI 4 – 6) among males and (slightly) to under 2 per 100,000 (CI 2 – 3) among females. This decrease in mortality rates will, however, be more than offset by increases in population size and by population ageing, yielding a net increase in the number of bladder cancer deaths: 124 deaths (CI 85 – 168) are projected among males and 71 deaths (CI 45 – 97) among females in 2012.

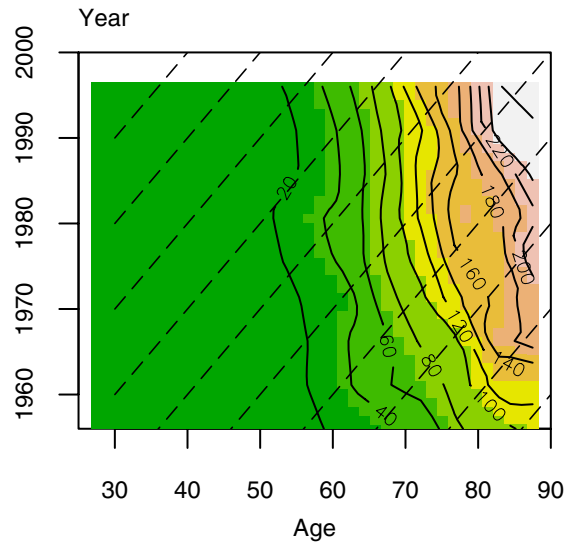
Among the selected cancer sites, bladder cancer incidence count is forecast to retain its fifth ranking among males and rise to ninth among females by 2011. By contrast, this cancer is expected to decline in ranking among both genders in regard to death count, and by the early 2010s will no longer be in the 'top ten' cancer sites for fatal burden.

**Figure 9.1** Historical trends in age specific rates, bladder cancer, males

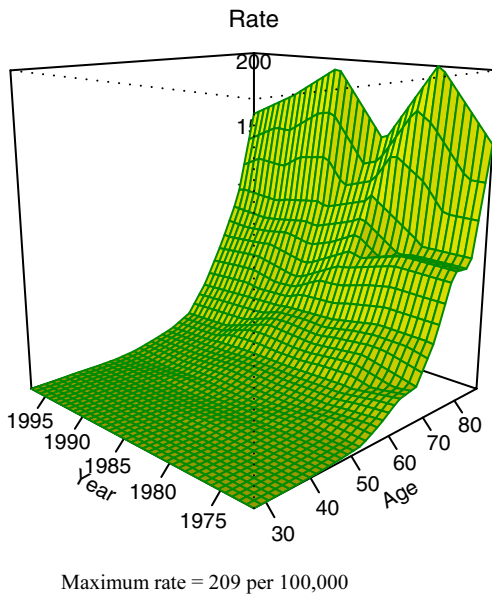
(a) Male incidence rates, perspective plot



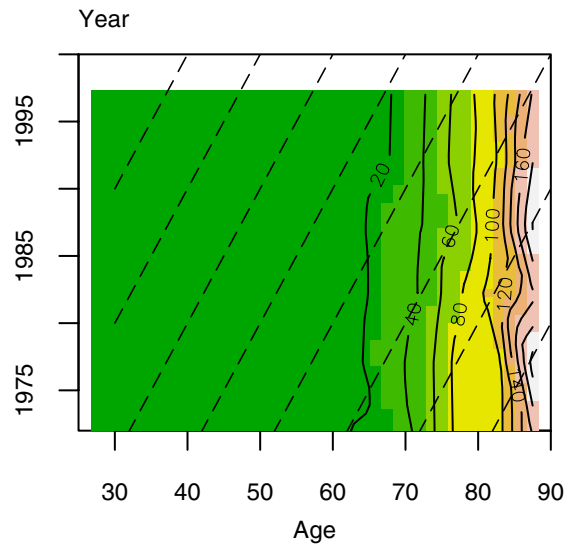
(b) Male incidence rates, contour plot



(c) Male mortality rates, perspective plot



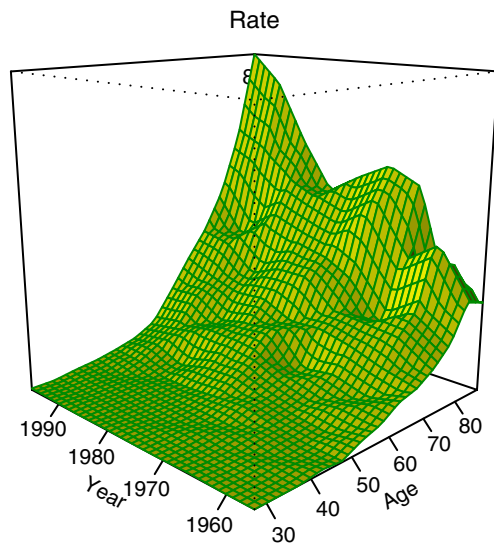
(d) Male mortality rates, contour plot



Please refer to Chapter 2 for interpretation of charts

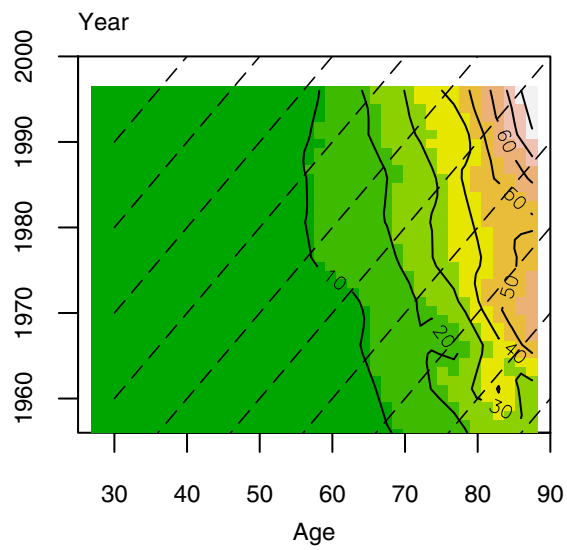
**Figure 9.2** Historical trends in age specific rates, bladder cancer, females

(a) Female incidence rates, perspective plot

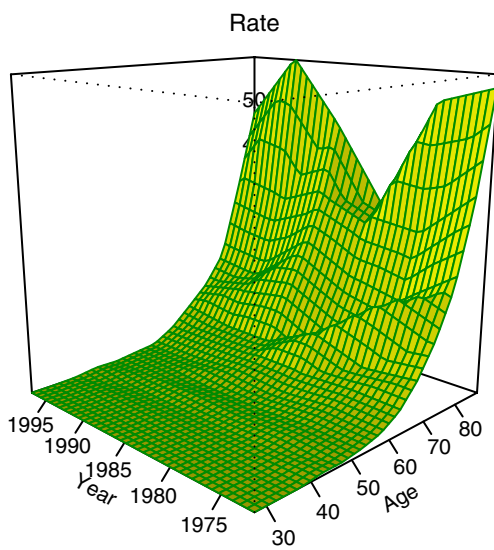


Maximum rate = 88 per 100,000

(b) Female incidence rates, contour plot

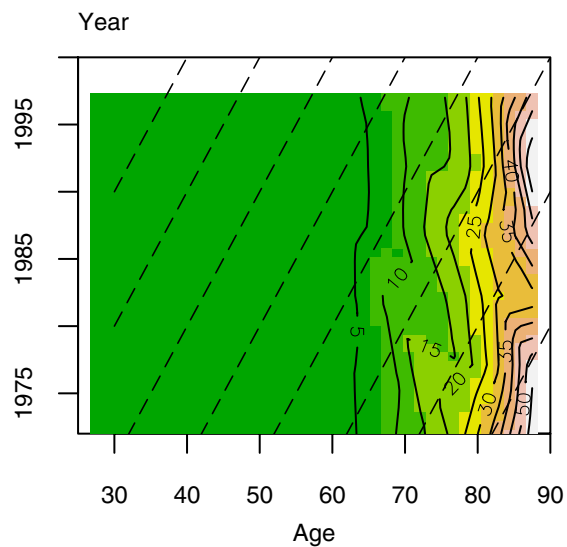


(c) Female mortality rates, perspective plot

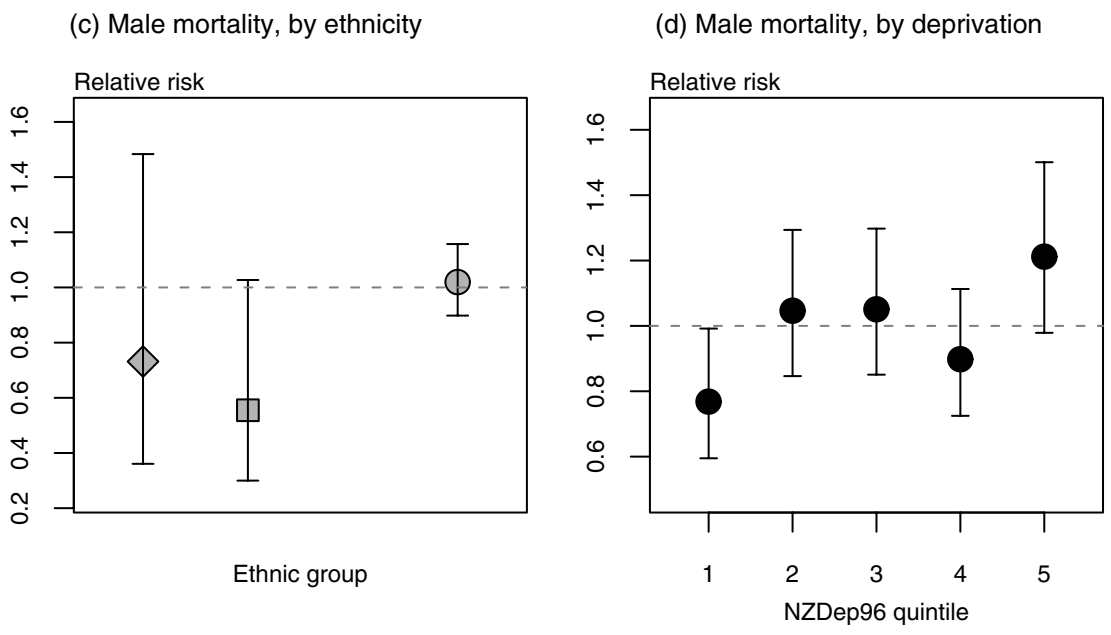
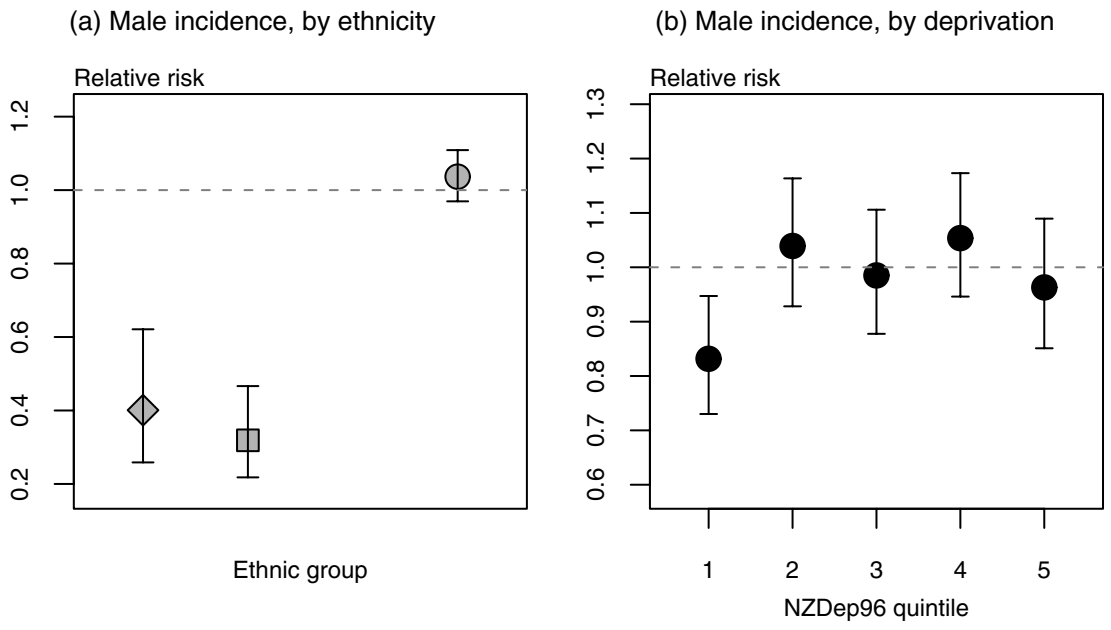


Maximum rate = 60 per 100,000

(d) Female mortality rates, contour plot



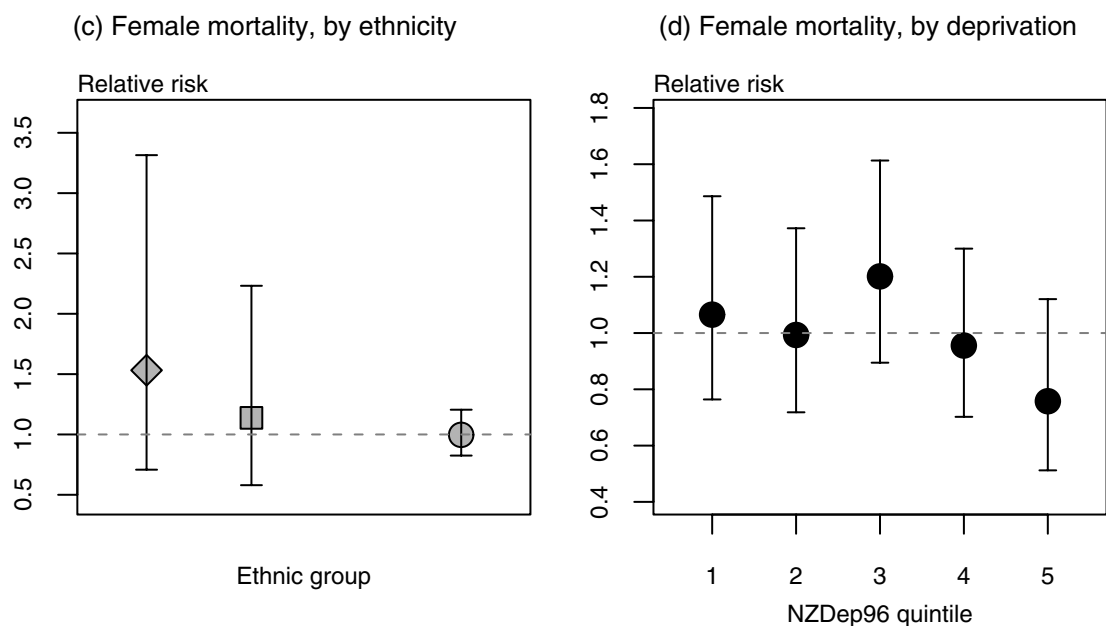
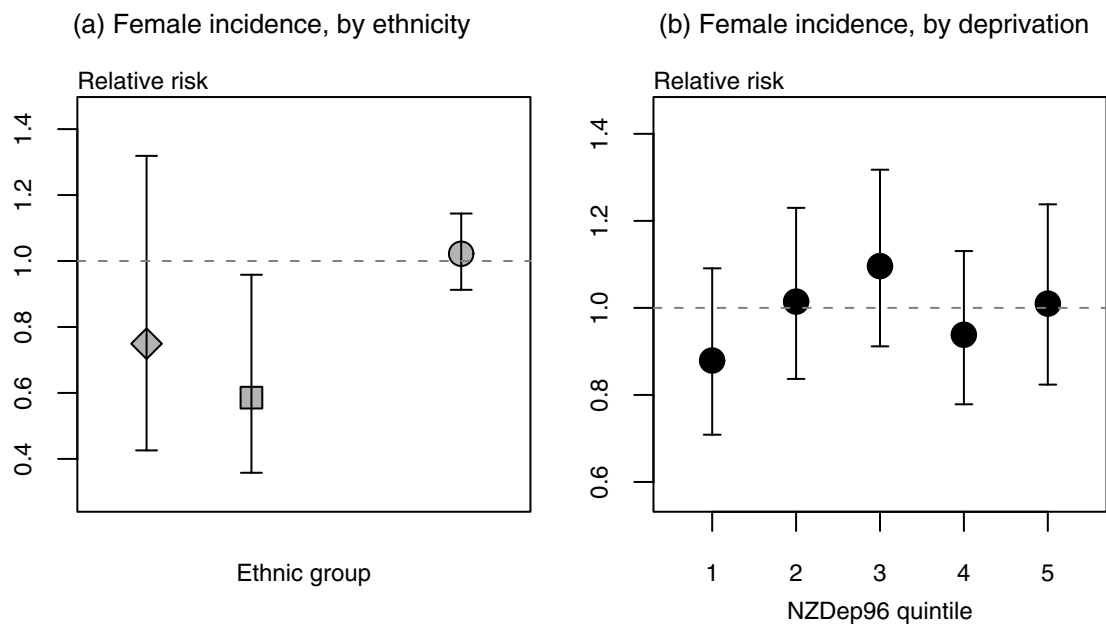
**Figure 9.3** Relative risk 1996/97, bladder cancer, males



Ethnic group key:

- ◆ sole Māori
- total Māori
- non-Māori

**Figure 9.4** Relative risk 1996/97, bladder cancer, females

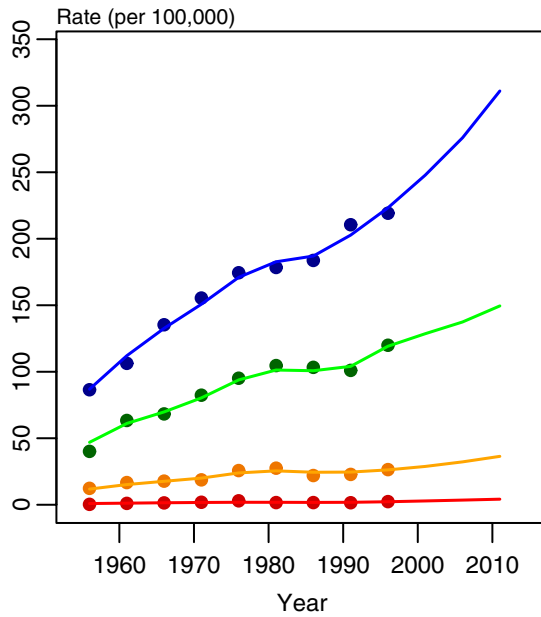


Ethnic group key:

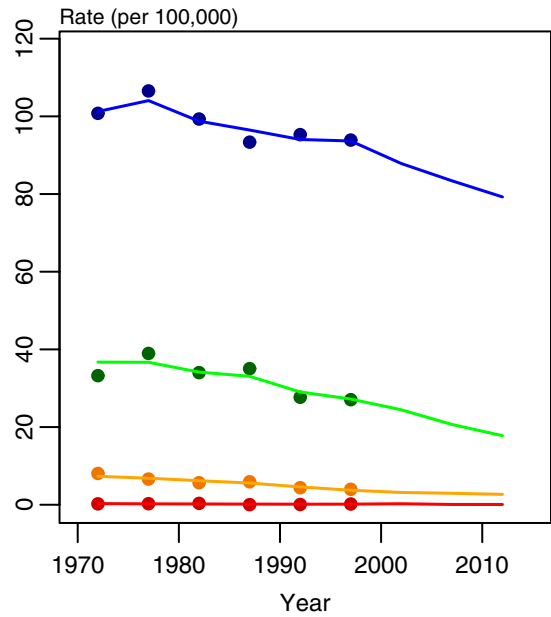
- ◆ sole Māori
- total Māori
- non-Māori

**Figure 9.5** Trends and projections of life cycle stage specific rates, bladder cancer

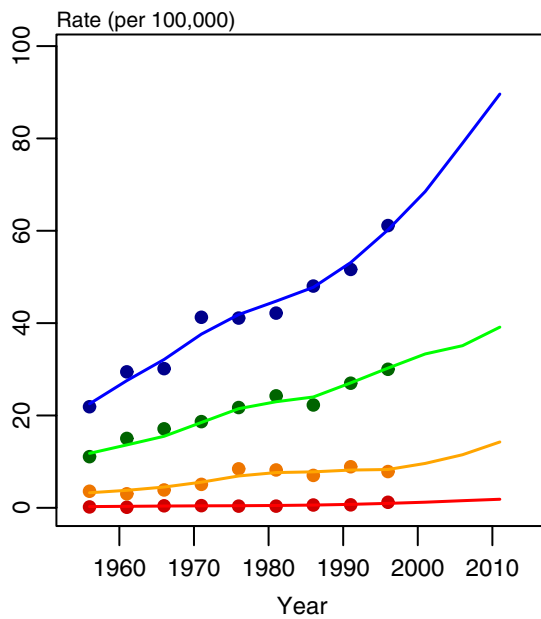
(a) Male incidence rates



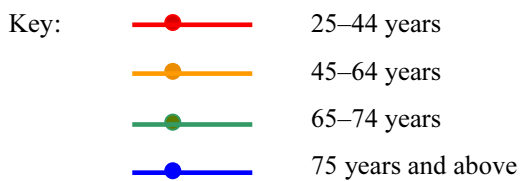
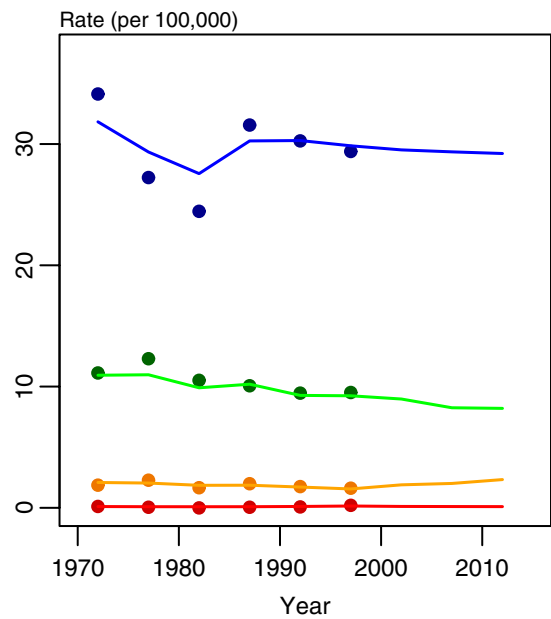
(b) Male mortality rates



(c) Female incidence rates

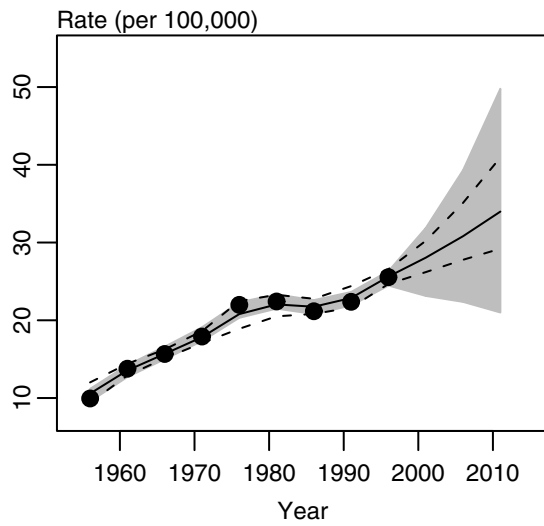


(d) Female mortality rates

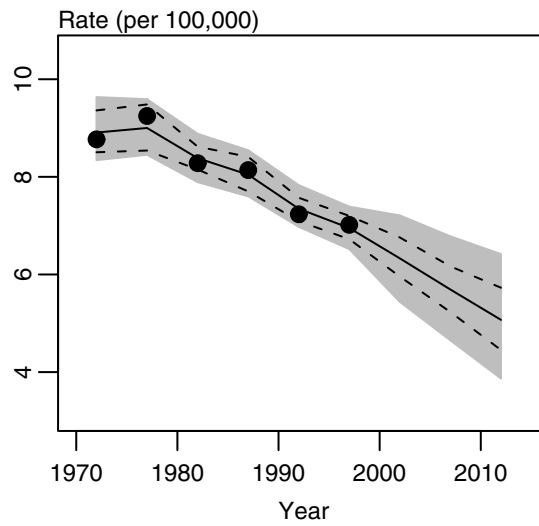


**Figure 9.6** Trends and projections of age standardised rates, bladder cancer

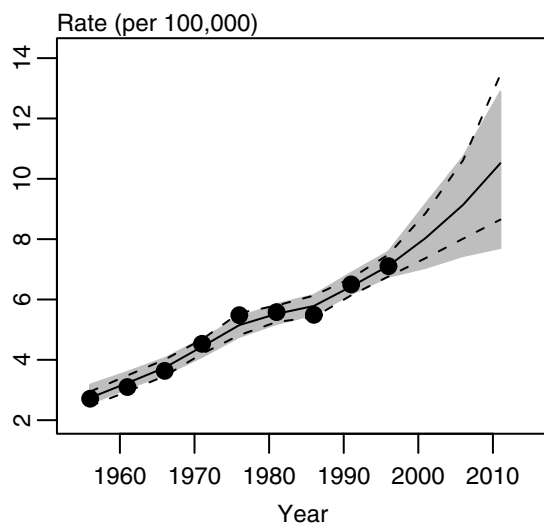
(a) Male incidence rates



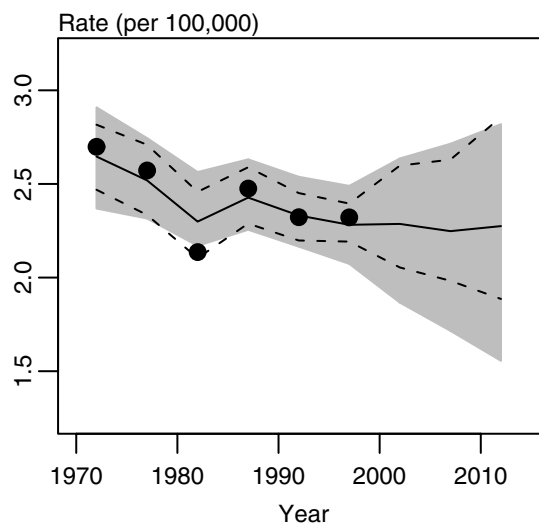
(b) Male mortality rates



(c) Female incidence rates



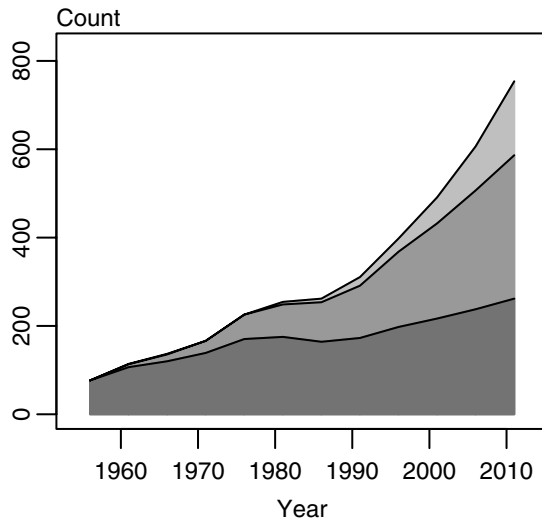
(d) Female mortality rates



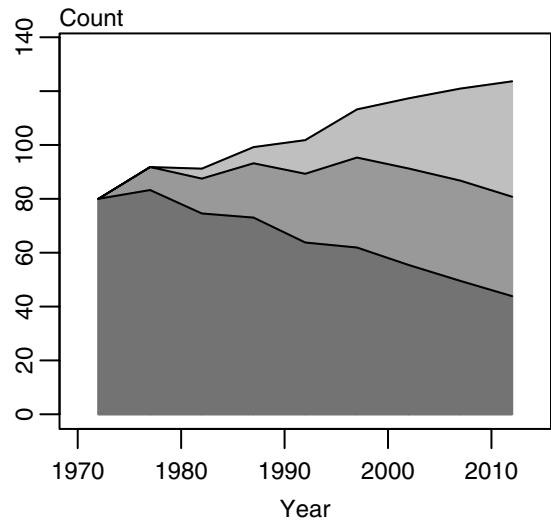
- Key:
- Observed
  - Fitted and projected
  - - Minimum and maximum estimates
  - 90% Bayesian credible interval

**Figure 9.7** Drivers of change in the cancer burden, bladder cancer

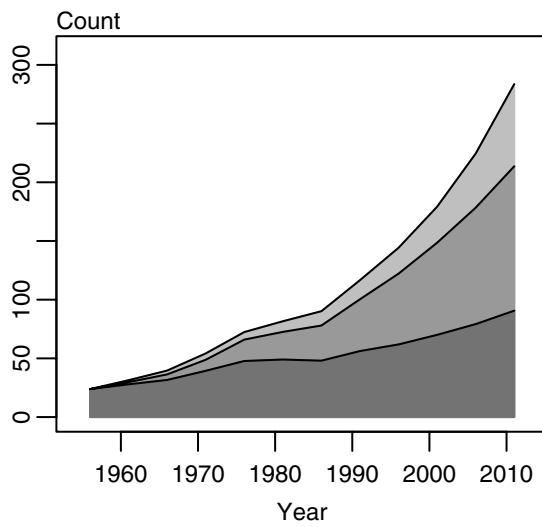
(a) Male registrations



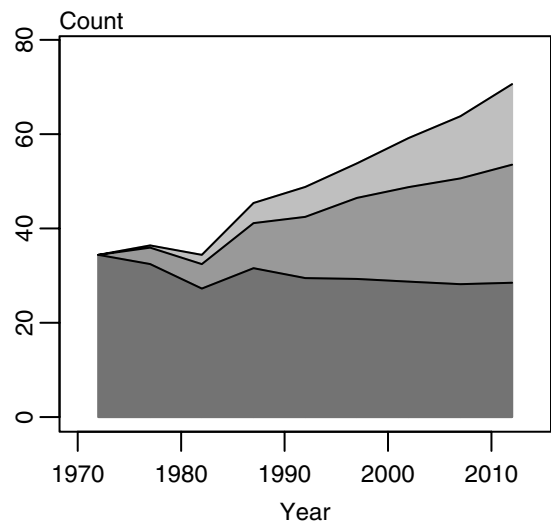
(b) Male deaths



(c) Female registrations



(d) Female deaths



Key:

- Risk effect
- Population size effect
- Population ageing effect

**Table 9.1** Key results, bladder cancer

## Males

	Incidence			Mortality		
	1996	2011 (CI)	change (%)	1997	2012 (CI)	change (%)
<i>Age standardised or age specific rate (per 100,000)</i>						
15+	26	34 (21 – 50)	33	7	5 (4 – 6)	-28
25–44	2	4 (2 – 5)	-	0	0 (0 – 0)	-
45–64	26	36 (21 – 55)	38	4	3 (2 – 4)	-
65+	156	215 (129 – 327)	38	52	42 (29 – 56)	-18
<i>Number of cases</i>						
15+	398	754 (444 – 1135)	89	113	124 (85 – 168)	10
25–44	13	23 (9 – 26)	77	1	0 (0 – 1)	-
45–64	98	196 (114 – 294)	100	15	15 (10 – 23)	0
65+	288	535 (321 – 814)	86	97	109 (75 – 143)	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	11 (8 – 13)	48	2	2 (2 – 3)	-
25–44	1	2 (1 – 2)	-	0	0 (0 – 0)	-
45–64	8	14 (9 – 18)	81	2	2 (1 – 2)	-
65+	44	63 (45 – 84)	42	19	18 (13 – 26)	-4
<i>Number of cases</i>						
15+	144	284 (193 – 369)	97	54	71 (45 – 97)	31
25–44	7	10 (5 – 12)	43	1	1 (0 – 1)	-
45–64	29	80 (51 – 101)	176	6	13 (5 – 13)	117
65+	108	194 (137 – 256)	80	46	57 (40 – 82)	24

CI = 90% Bayesian credible interval

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