

### **Mortality and incidence trends for adenocarcinoma of the oesophagus in Queensland, 1982 to 2001**

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#### **Summary**

The epidemiology of oesophageal cancer has undergone a dramatic change over the last two decades.

Twenty years ago almost all oesophageal cancers were squamous cell carcinomas, which are mainly caused by cigarette smoking and alcohol consumption.

Today, about 44% of oesophageal cancers in Queensland are adenocarcinomas, which are associated with reflux (heartburn) and obesity.

Over the last 20 years in Queensland, incidence and mortality from adenocarcinoma of the oesophagus have increased by about 4%-7% per year, which is faster than any other cancer except mesothelioma. Similar rates of increase have been reported in other Australian states and in other established market economies.

Oesophageal cancers are renowned for poor survival. Less than 20% of patients are alive five years after diagnosis.

The prevalence of obesity continues to increase in Queensland and Australia. The available data show that obesity is associated with gastro-oesophageal reflux (heartburn), and both are strong risk factors for adenocarcinoma of the oesophagus.

Adenocarcinoma of the oesophagus is not a common cancer, but its sharp rate of increase is potentially important from a public health perspective. Increasing levels of obesity may mean that this cancer becomes more important.

#### **Introduction**

Many cancers are now being prevented or cured and when we look at all cancers combined, we find that mortality rates in Queensland (and in the rest of Australia and other established market

economies) have been decreasing since at least the mid 1990s.<sup>1</sup> However, for a small number of cancers, mortality is increasing. The most notable of these in Queensland and Australia is lung cancer in women, but there have also been increases in mortality for non-Hodgkin's lymphoma (in both men and women) and mesothelioma (although the absolute numbers are small).<sup>2</sup>

Another cancer that has come to attention because mortality is increasing is adenocarcinoma of the oesophagus. This cancer occurs at the lower end of the oesophagus (near the stomach) and is associated with gastro-oesophageal reflux disease and obesity. Obesity is increasing, raising concerns that rates of adenocarcinoma of the oesophagus will continue to increase in the foreseeable future.

This circular presents information on trends in incidence, mortality and survival for adenocarcinoma of the oesophagus.

#### **Types of oesophageal cancer**

The epidemiology of oesophageal cancer has undergone dramatic changes in the past two decades. Twenty years ago almost all oesophageal cancers were squamous cell carcinomas arising in the upper third of oesophagus (see Appendix). The risk of squamous cell carcinoma is almost entirely explained by tobacco and alcohol consumption and it was thought that to decrease the risk of oesophageal cancer in western populations you only had to decrease the intake of tobacco and alcohol.<sup>3</sup>

In the late 1980s it became apparent that many developed countries were experiencing an increase in adenocarcinoma of the oesophagus. These cancers arise in the lower third of the oesophagus, that is, near the stomach, and are not related to smoking or alcohol. Instead, they are related to obesity and gastro-oesophageal reflux.

(NOTE: A small proportion of cancers of the oesophagus are neither squamous cell carcinoma or adenocarcinoma and are categorised as other.)

## Trends in Queensland

Both incidence (new cases) and mortality (deaths) due to adenocarcinoma of the oesophagus in Queensland are increasing by more than 7% per year (see Table 1 and Figures 1-6). By any standard, this is an exceedingly rapid increase and is much greater than that observed for other common cancers with increasing mortality rates. For example, mortality rates due to non-Hodgkin's lymphoma are increasing by about 1% per year (for both men and women); mortality rates due to lung cancer in women are increasing by about 2.5% per year.

The numbers of incidence cases and deaths for each year are found in Tables 4 & 5 in Appendix.

Table 1: Age adjusted incidence and mortality trends by type of oesophageal cancer, Queensland, 1982 to 2001

Type of oesophageal cancer	Annual percentage change (95% CI)	
	Incidence	Mortality
Adenocarcinoma	7.3 (5.9, 8.7)	7.6 (6.1, 9.3)
Squamous cell carcinoma	0.3 (-0.5, 1.2)	-0.3 (-1.3, 0.7)
Other	-3.4 (-5.2, -1.6)	-5.1 (-6.9, -3.3)

Note:  
 1. For adenocarcinoma and other cancers of the oesophagus combined, incidence and mortality increased by 4.0% and 3.0% per year, respectively.  
 2. Annual percentage change was calculated using Poisson regression to adjust for age differences in the Queensland population over time.

Figure 1: Trends in incidence of adenocarcinoma of the oesophagus, Queensland

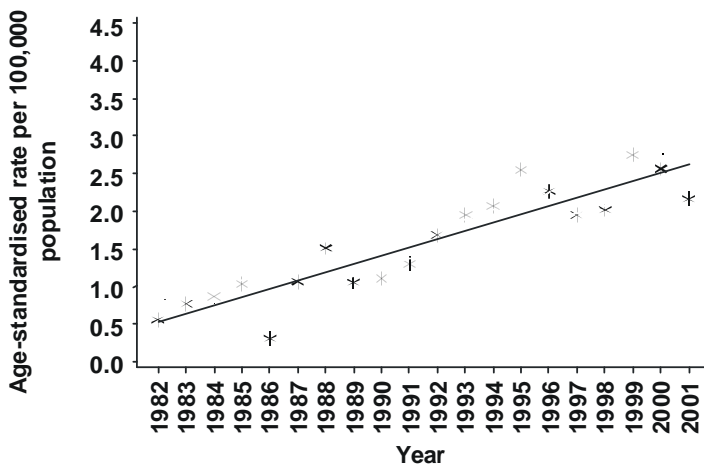


Figure 2: Trends in incidence of squamous cell carcinoma of the oesophagus, Queensland

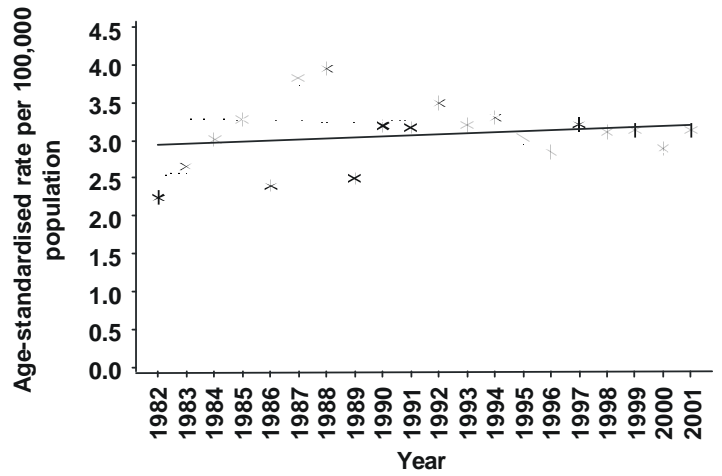


Figure 3: Trends in incidence of other types of cancer of the oesophagus, Queensland

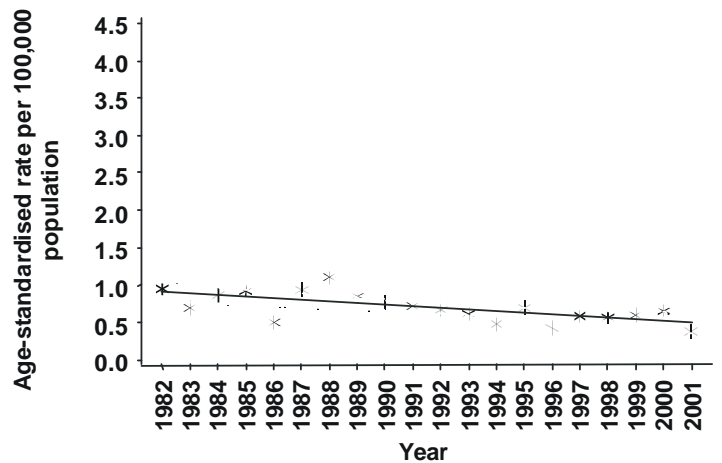


Figure 4: Trends in mortality of adenocarcinoma of the oesophagus, Queensland

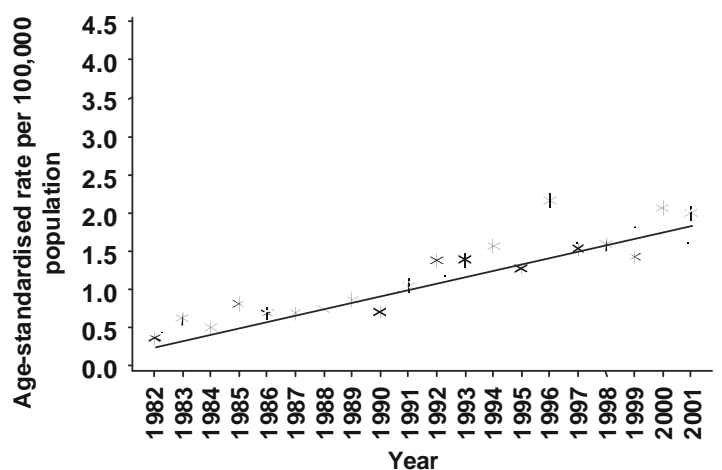


Figure 5: Trends in mortality of squamous cell carcinoma of the oesophagus, Queensland

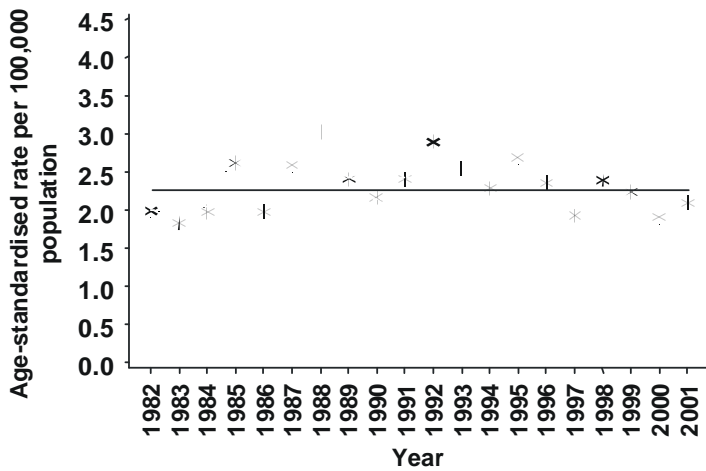
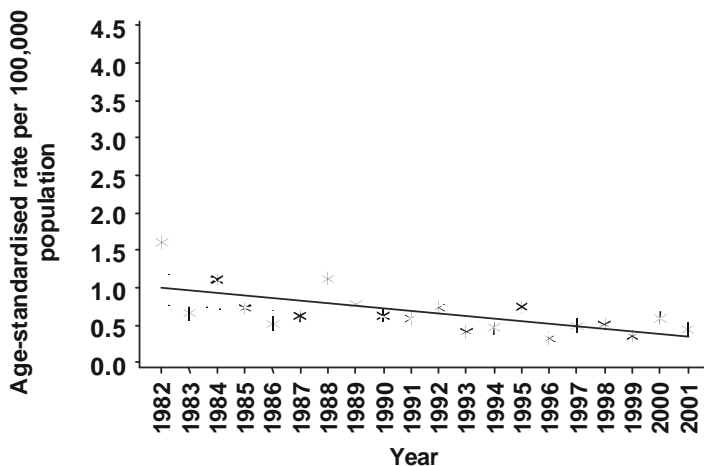


Figure 6: Trends in mortality of other types of cancer of the oesophagus, Queensland



The only cancer to show a comparable increase in mortality is mesothelioma. Mortality increases for this cancer are mainly related to increasing occupational exposure to asbestos more than 20 or 30 years ago. It remains to be seen whether mortality from this relatively uncommon cancer will plateau in the next 15 to 20 years as predicted. Nevertheless, the fact remains that, besides mesothelioma, adenocarcinoma of the oesophagus is increasing more rapidly than any other cancer in Queensland. The same is true in other states of Australia and in other established market economies.

### Age-specific rates

The risk of adenocarcinoma of the oesophagus increases with increasing age (Figures 7 & 8). The median-age-at-diagnosis for patients with adenocarcinoma of the oesophagus is 70 years. For patients with squamous cell carcinoma the median age at diagnosis is 71 years. Median-age-at-death is only a couple of years older than the median-age-at-diagnosis (72 years for both adenocarcinoma and squamous cell carcinoma), reflecting the poor survival from this cancer (see next section).

Figure 7: Average age-specific mortality rates for adenocarcinoma of the oesophagus by sex, Queensland, 1997-2001

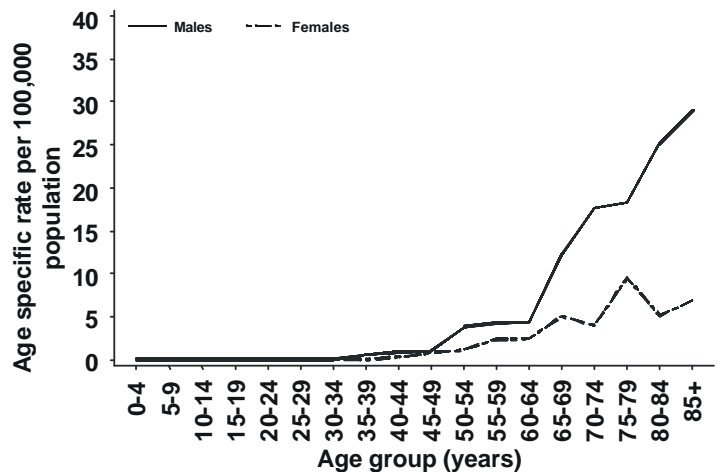
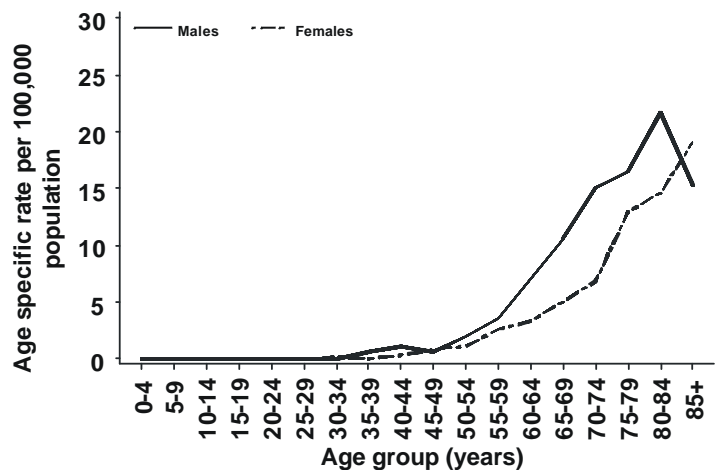


Figure 8: Average age-specific mortality rates for squamous cell carcinoma of the oesophagus by sex, Queensland, 1997-2001



## Survival

Survival from all types of oesophageal cancer is poor with one-year survival of about 40%-50% and five-year survival of less than 20%. These figures are similar to those reported from other Australian states and overseas. As observed in the other states and overseas there has been some improvement in survival in Queensland over time (Table 2).<sup>4</sup>

Queensland increased from 48.5% in 1995 to 50.8% in 2000 for women and from 66.8% in 1995 to 67.1% in 2000 for men.<sup>9,10</sup> Similar increases and levels of overweight and obesity have been observed in the other states of Australia. Continuing increases in obesity may lead to continuing increases in adenocarcinoma of the oesophagus.

Table 2: Cause-specific survival by types of oesophageal cancer in Queensland (1982-2001)

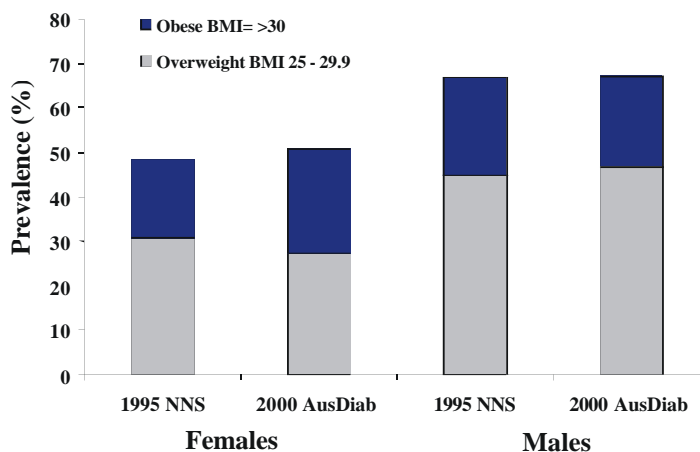
	Adenocarcinoma (%)		Squamous cell carcinoma (%)		Other (%)	
	1-year survival (CI)	5-year survival (CI)	1-year survival (CI)	5-year survival (CI)	1-year survival (CI)	5-year survival (CI)
Sex						
Males	47.1 (43.4, 50.8)	17.3 (14.3, 20.6)	42.2 (38.9, 45.5)	12.8 (10.4, 15.5)	26.6 (19.9, 33.8)	13.5 (8.3, 20.1)
Females	37.4 (28.8, 46.0)	9.8 (4.6, 17.2)	48.6 (44.6, 52.5)	24.3 (20.6, 28.1)	30.8 (22.5, 39.5)	14.9 (8.6, 22.9)
Persons	45.7 (42.2, 49.1)	16.2 (13.5, 19.2)	44.9 (42.3, 47.4)	17.7 (15.6, 20.0)	28.4 (23.1, 33.9)	14.2 (10.0, 19.1)
Age at diagnosis						
0-69 years	52.5 (47.7, 57.1)	19.8 (15.8, 24.0)	47.7 (44.2, 51.1)	19.5 (16.6, 22.6)	31.0 (22.1, 40.4)	17.7 (10.5, 26.4)
70+ years	38.1 (33.2, 42.9)	12.0 (8.5, 16.2)	41.6 (37.9, 45.4)	15.5 (12.4, 18.8)	26.9 (20.4, 33.8)	11.9 (7.1, 18.1)
Period of diagnosis						
1982-1986	31.4 (20.6, 42.8)	6.7 (2.2, 14.7)	33.3 (27.6, 39.1)	10.1 (6.6, 14.4)	31.2 (20.3, 42.8)	13.4 (6.1, 23.5)
1987-1991	48.3 (39.6, 56.4)	15.0 (9.5, 21.7)	44.4 (39.2, 49.4)	17.2 (13.4, 21.4)	26.0 (16.9, 36.1)	14.0 (7.4, 22.8)
1992-1996	46.8 (40.9, 52.5)	20.4 (15.8, 25.4)	47.6 (42.7, 52.3)	19.3 (15.6, 23.4)	28.3 (17.0, 40.7)	20.5 (10.3, 33.2)
1997-2001	46.4 (40.9, 51.7)	--	49.3 (44.5, 53.9)	22.4 (16.9, 28.4)	29.3 (19.2, 40.0)	--

## Obesity and reflux in adenocarcinoma of the oesophagus

About 36% of the Australian population has dyspepsia and about 60% of these have gastro-oesophageal reflux.<sup>5</sup> Reflux is associated with adenocarcinoma of the oesophagus and obesity has been shown to be both a strong risk factor for reflux and adenocarcinoma of the oesophagus.<sup>6,7</sup> Also, studies have found a strong association between obesity and oesophageal cancer.<sup>8</sup>

If, as these data seem to show, obesity is a risk factor for reflux, which in turn is a risk factor for adenocarcinoma of the oesophagus, then there are potentially important public health implications. For example, the measured data from the National Nutrition Survey (NNS) and Diabetes, Obesity and Lifestyle Study (AusDiab) found that the prevalence of overweight and obesity in

Figure 9: Prevalence of overweight and obesity in Queensland by gender 1995 National Nutrition Survey and 2000 AusDiab



## Methods

Data were extracted from the Queensland Cancer Registry (QCR) for the period between 1982 to 2001. Morphology codes were used to classify types of oesophageal cancer, which are coded by QCR according to the International Classification of Diseases of Oncology (ICD-O).

Table 3: Morphology codes by type of oesophageal cancer

Adenocarcinoma	Squamous cell carcinoma	Other
81403	80513	80003
81443	80703	80103
81453	80713	80203
82003	80723	80323
82463	80733	80413
82603	80743	81233
82613		85603
84803		87203
84813		88903
84903		89803

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## Appendix

Table 4: New cases (incidence) by type of oesophageal cancer, Queensland, 1982-2001

Year	Adenocarcinoma		Squamous cell carcinoma		Other		Total	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
1982	11	15.9	41	59.4	17	24.6	69	100
1983	14	17.5	52	65.0	14	17.5	80	100
1984	17	17.9	61	64.2	17	17.9	95	100
1985	21	19.4	70	64.8	17	15.7	108	100
1986	6	8.8	52	76.5	10	14.7	68	100
1987	23	18.1	84	66.1	20	15.7	127	100
1988	33	22.4	90	61.2	24	16.3	147	100
1989	24	23.8	58	57.4	19	18.8	101	100
1990	27	21.8	79	63.7	18	14.5	124	100
1991	33	25.2	80	61.1	18	13.7	131	100
1992	45	30.0	90	60.0	15	10.0	150	100
1993	54	35.3	83	54.2	16	10.5	153	100
1994	57	35.2	92	56.8	13	8.0	162	100
1995	73	40.8	87	48.6	19	10.6	179	100
1996	66	40.7	84	51.9	12	7.4	162	100
1997	59	34.1	97	56.1	17	9.8	173	100
1998	63	35.8	96	54.5	17	9.7	176	100
1999	88	42.5	100	48.3	19	9.2	207	100
2000	85	42.1	96	47.5	21	10.4	202	100
2001	74	38.1	107	55.2	13	6.7	194	100
Total	873	31.1	1599	56.9	336	12.0	2808	100

Table 5: Deaths by type of oesophageal cancer, Queensland, 1982-2001

Year	Adenocarcinoma		Squamous cell carcinoma		Other		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1982	6	8.3	37	51.4	29	40.3	72	100
1983	12	19.7	36	59.0	13	21.3	61	100
1984	10	14.3	38	54.3	22	31.4	70	100
1985	16	19.0	55	65.5	13	15.5	84	100
1986	14	20.9	43	64.2	10	14.9	67	100
1987	14	16.9	57	68.7	12	14.5	83	100
1988	17	15.2	70	62.5	25	22.3	112	100
1989	19	20.0	59	62.1	17	17.9	95	100
1990	17	20.2	52	61.9	15	17.9	84	100
1991	26	26.5	58	59.2	14	14.3	98	100
1992	36	28.3	74	58.3	17	13.4	127	100
1993	38	33.0	66	57.4	11	9.6	115	100
1994	43	36.4	62	52.5	13	11.0	118	100
1995	36	27.3	76	57.6	20	15.2	132	100
1996	63	45.0	68	48.6	9	6.4	140	100
1997	46	39.0	58	49.2	14	11.9	118	100
1998	50	36.0	74	53.2	15	10.8	139	100
1999	46	35.9	71	55.5	11	8.6	128	100
2000	68	45.6	62	41.6	19	12.8	149	100
2001	68	44.2	71	46.1	15	9.7	154	100
Total	645	30.1	1187	55.3	314	14.6	2146	100