

**Ovarian cancer  
in Australia:  
an overview, 2006**

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The NBCC works with consumers, health professionals, cancer organisations, researchers and governments to improve the management of breast and ovarian cancer and the wellbeing of people with these cancers. It aims to improve health outcomes for people with breast and ovarian cancer by ensuring that wherever they live, they receive the best possible care.

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# **Ovarian cancer in Australia: an overview, 2006**

**Australian Institute of Health and Welfare  
and  
National Breast Cancer Centre**

**November 2006**

Australian Institute of Health and Welfare  
Canberra

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# Foreword

For the first time, *Ovarian cancer in Australia: an overview, 2006* brings together under one cover the most recent information available on the epidemiology, public health and health services impact of ovarian cancer on Australia women. These data are central to advancing our efforts to control this disease. Together with its sister publication – *Breast cancer in Australia: an overview, 2006* – the current report allows us to build a nationwide snapshot of a major condition affecting a substantial number of Australians. The data on which these reports are based are collected through population-based cancer registries and other sources, highlighting their importance as a national resource.

This report identifies areas of significant gain over time and provides some projections for the future. Our ability to plan for services and patient needs are predicated on this understanding of the impact of the disease as it affects our population.

*Ovarian cancer in Australia: an overview, 2006* also represents the significant contributions by, and the continuing partnership of, the National Breast Cancer Centre, the Australian Institute of Health and Welfare and the Australasian Association of Cancer Registries. We would like to thank the staff members of the various cancer registries and data repositories. It is through their effort and diligence that these data are available to the Australian public.

Surveillance and monitoring activities play a pivotal role in enhancing our capacity to achieve change. We anticipate that the information contained in *Ovarian cancer in Australia: an overview, 2006* will be used extensively to further our goal of reducing the mortality from ovarian cancer and improving the wellbeing of women with the disease.

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The report was prepared by Emily Conley, John Harding, Edith Christensen and Dr Mark Short of the Australian Institute of Health and Welfare (AIHW) Health Registers and Cancer Monitoring Unit and Robert Van der Hoek of the AIHW Population Health Unit. Cancer incidence projections were undertaken by Ian McDermid of the Health Registers and Cancer Monitoring Unit.

The support of the Australasian Association of Cancer Registries in both provision of data and reviewing the draft report is also greatly appreciated.

# Abbreviations

AACR	Australasian Association of Cancer Registries
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
ARIA	Accessibility/Remoteness Index for Australia
ASGC	Australian Standard Geographical Classification
ASR	age-standardised rate, standardised to the 2001 Australian standard population
ASR(W)	age-standardised rate, standardised to the World Standard Population
CI	confidence interval (see Glossary)
DoHA	Australian Government Department of Health and Ageing
ERP	estimated resident population
ICD	International Classification of Diseases
ICD-O	International Classification of Diseases for Oncology
IRSD	Index of Relative Socio-economic Disadvantage
NBCC	National Breast Cancer Centre
NHL	Non-Hodgkin's lymphoma
NOS	not otherwise specified
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
SA	South Australia
SES	socioeconomic status
Tas	Tasmania
Vic	Victoria
WA	Western Australia
WHO	World Health Organization

# Executive summary

This report by the Australian Institute of Health and Welfare (AIHW) and the National Breast Cancer Centre (NBCC) aims to provide a comprehensive statistical overview of ovarian cancer in Australia.

Ovarian cancer was the 8th most common cancer diagnosed in women in Australia in 2002 and the 6th most common cause of cancer death. Five-year relative survival for women diagnosed from 1998 to 2002 was 42%.

Information sources for Australian national data were the most current available at the time of preparation of the report and the time periods for these sources vary.

Data included in the report include ovarian cancer incidence to 2002 with projections to 2011, prevalence to 2002, mortality to 2004, survival to 2002, hospital admissions to 2003–04 and expenditure in 2000–01.

The main findings are as follows.

## Incidence

- The number of new cases of ovarian cancer increased from 862 in 1983 to 1,273 in 2002. It is projected that there will be 1,465 new cases of ovarian cancer in 2006 and 1,645 in 2011.
- The age-standardised incidence rate of ovarian cancer remained stable at 12 to 13 new cases per 100,000 population from 1983 to 2002.
- The average age at first diagnosis of ovarian cancer increased from 59.6 years in 1983 to 63.2 years in 2002; the median age increased from 61 to 64 years during the same period.
- Australian females born in 2000–2004 have a life expectancy of 83.0 years. A woman's risk of a first diagnosis of ovarian cancer before the age of 75 years declined slightly from 1 in 97 in 1983 to 1 in 108 in 2002, but the risk of diagnosis before the age of 85 increased slightly from 1 in 69 in 1983 to 1 in 67 in 2002.
- Ovarian cancer is relatively rare in Aboriginal and Torres Strait Islander women. Ovarian cancer was the seventh most common cancer diagnosed in Aboriginal and Torres Strait Islander women, with 34 cases, over the six-year period of 1997–2002 in Queensland, South Australia, Western Australia and the Northern Territory.
- Country of birth data are not available nationally. However, in New South Wales from 1993–2003 Australian-born women had an age-standardised rate of 9.8 new cases of ovarian cancer per 100,000 population, higher than the rates experienced by women born in the Middle East (7.4 per 100,000) and Asia (8.7 per 100,000) but lower than the rates experienced by women born in New Zealand (11.5 per 100,000), United Kingdom and Ireland (12.4 per 100,000) and Southern Europe (11.2 per 100,000). But, because of the small numbers of cases, these differences were not statistically significant.
- Of the 21,728 women first diagnosed with ovarian cancer between 1982 and 2002, there were 11.5% (2,501 women) diagnosed with other cancers. For these women, there were 2,676 other cancers diagnosed. The most common other cancers diagnosed were breast cancer, cancer of the uterus and cancer of the colon.

## **Mortality**

- There were 851 deaths due to ovarian cancer in 2004. There were an average of 49 additional cases per year from 2000–2004 in which ovarian cancer contributed to death but was not the underlying (primary) cause of death.
- The age-standardised mortality rate of ovarian cancer has decreased from 9.2 deaths per 100,000 females in 1968 to 7.5 deaths per 100,000 females in 2004.
- The median age of death due to ovarian cancer increased from 65 in 1983 to 71 in 2004.
- The risk for women of dying from ovarian cancer before the age of 75 has been declining, from 1 in 142 in 1983 to 1 in 176 in 2004. However, the risk of dying before the age of 85 experienced little change over this 20-year period; it was 1 in 91 in 1983 and 1 in 95 in 2004.
- Aboriginal and Torres Strait Islander women had nearly 40% higher rates of ovarian cancer mortality than the Australian population as a whole, based on age-standardised rates for the 2000–2004 period. However, because of small numbers, this higher rate was not statistically significant.

## **Survival**

- There was a significant increase in relative survival after diagnosis of ovarian cancer in women between 1982–1986 and 1998–2002. One-year relative survival increased from 63.5% to 73.3% and five-year relative survival increased from 34.3% to 42.1%.
- The largest improvements in five-year relative survival between 1982–1986 and 1998–2002 were for women diagnosed with ovarian cancer in all age groups from 40 to 69 years. For women aged 40–49 years five year relative survival improved from 45% in 1982–1986 to 63% in 1998–2002, for women 50–59 years from 37% to 51%, and for women 60–69 years from 28% to 43%. Furthermore, for women aged 60–69 years, the most common age group of diagnosis, the greatest improvement occurred in the most recent decade. In this age group, five-year relative survival improved from 33% for women diagnosed in 1992–1997 to 43% for women diagnosed in 1998–2002.

## **Prevalence**

- In 2002 there were 7,330 women alive who had been diagnosed with ovarian cancer in the previous 20 years.

## **International comparisons**

- Australia's age-standardised incidence of ovarian cancer of 8.9 cases per 100,000 population was lower than the United Kingdom (13.4 per 100,000), New Zealand (12.4), Canada (11.6) and the United States of America (10.6).
- Australia also had a lower age-standardised rate of mortality for ovarian cancer of 4.9 cases per 100,000 population compared with the United Kingdom (8.0 per 100,000), New Zealand (6.4), the United States of America (6.1) and Canada (5.9).
- Australia's five-year relative survival of 42.1% for women diagnosed from 1998–2002 was similar to the 44.7% experienced by women in the United States of America diagnosed from 1996–2002.

## **Hospital treatment**

- The most common procedure for patients with a principal diagnosis of ovarian cancer in 2003–04 was *Chemotherapy administration* (Block 1780), followed by *Abdominal hysterectomy* (Block 1268) and *Salpingo-oophorectomy* (Block 1252).
- The number of separations for patients with a principal diagnosis of ovarian cancer (ICD-10 C56) remained fairly stable at 3,300–3,600 separations per financial year from 1995–96 to 2003–04.
- The average length of stay for patients with a principal diagnosis of ovarian cancer increased from 6.2 days in 1995–96 to 6.9 days in 2003–04.

## **Expenditure**

- Total expenditure on ovarian cancer was \$25 million in 2000–01. Of this, \$19 million was spent on hospital admitted patients, \$1 million on out-of-hospital medical costs and \$2 million on pharmaceuticals requiring a prescription.
- Ovarian cancer had an estimated lifetime treatment cost per case of \$19,677 in 2000–01.



# 1 Incidence

Ovarian cancer was the eighth most common invasive cancer diagnosed in women in Australia in 2002.

The Australian Institute of Health and Welfare (AIHW) receives data on new cases of cancer (excluding non-melanoma skin cancer) from the eight state and territory cancer registries for cancers diagnosed in residents of Australia. These records are held in the National Cancer Statistics Clearing House (NCSCCH) and include new cases of cancer in Australia from 1982 onwards.

Information on incidence from the NCSCCH is available from data cubes on the AIHW website (<[www.aihw.gov.au](http://www.aihw.gov.au)>) containing Australian cancer incidence data from 1983 and through annual AIHW *Cancer in Australia* publications.

This chapter details national ovarian cancer incidence statistics and rates by type of ovarian cancer, geographic category, socioeconomic status, Indigenous status and other cancer information.

The incidence statistics in this report include 73 cases of tumours of uncertain behaviour as these tumour types were classified as malignant in the 2nd edition of the International Classification of Diseases for Oncology (ICD-O), on which all the tabulations in this publication are based. In the 3rd edition of the ICD-O these are treated as non-malignant and will not be included in future reports. These tumours of uncertain behaviour are identified in Table 1.5.

The main features of incidence of ovarian cancer are as follows.

## Numbers and rates

- The number of new cases of ovarian cancer increased from 862 in 1983 to 1,273 in 2002 (Table 1.1). It is projected that there will be 1,465 new cases of cancers of the ovary and other unspecified female genital organs in 2006 and 1,645 in 2011 (Table 1.2).
- The age-standardised incidence rate of ovarian cancer has remained stable at 12–13 new cases per 100,000 population from 1983 to 2002 (Table 1.1).
- The greatest increase in incidence from 1992 to 2002 occurred in women aged 80 years and over (Table 1.3). In the 80–84 year age group the incidence rate increased from 38 per 100,000 population in 1992 to 64 per 100,000 population in 2002; in women 85 years and over the rate increased from 37 per 100,000 population in 1992 to 49 per 100,000 in 2002.
- In all age groups from 30–34 to 70–74 the age-specific incidence rates of ovarian cancer have decreased slightly since 1992 (Table 1.3, Figure 1.1). For example in the 55–59 year age group the incidence rate decreased from 31 per 100,000 population in 1992 to 24 per 100,000 population in 2002.
- The average age at first diagnosis of ovarian cancer increased from 59.6 years in 1992 to 63.2 years in 2002; the median age increased from 61 to 64 years during the same period (Table 1.4).
- Australian females born in 2000–2004 have a life expectancy of 83.0 years. The risk of a diagnosis of ovarian cancer before the age of 75 decreased slightly from 1 in 97 in 1983 to 1 in 108 in 2002 (Table 1.4).
- The risk of a diagnosis of ovarian cancer before the age of 85 increased slightly from 1 in 69 in 1983 to 1 in 67 in 2002 (Table 1.4).

## Histology

- *Papillary serous cystadenocarcinoma* was the most common recorded histology for ovarian cancer in 2002 with 23.2% of new cases (Table 1.5). *Serous cystadenocarcinoma, not otherwise specified* was the second most common with 13.1% of cases in 2002.

## Geographic differences

- The incidence rates of ovarian cancer between regional categories do not differ significantly in either the 1993–1997 or the 1998–2002 five-year periods (Table 1.6).
- Of the states and territories, Queensland had the highest age-standardised incidence rate of ovarian cancer at 14.2 new cases per 100,000 population in 1998–2002 (Table 1.7).

## Socioeconomic status

- The incidence rates of ovarian cancer in each socioeconomic status quintile do not differ significantly from each other in the 2000–2002 period (Table 1.8).

## Aboriginal and Torres Strait Islander women

- Ovarian cancer is relatively rare in Aboriginal and Torres Strait Islander women. Ovarian cancer was the seventh most common cancer in Aboriginal and Torres Strait Islander women, with 34 cases, over the six-year period of 1997–2002 in Queensland, South Australia, Western Australia and the Northern Territory.

## Country of birth

- Country of birth data are not available nationally. However, in New South Wales from 1993–2003 Australian-born women had an age-standardised rate of 9.8 new cases of ovarian cancer per 100,000 population, higher than the rates experienced by women born in the Middle East (7.4 per 100,000) and Asia (8.7 per 100,000) but lower than the rates experienced by women born in New Zealand (11.5 per 100,000), United Kingdom and Ireland (12.4 per 100,000) and Southern Europe (11.2 per 100,000). Because of the small numbers of cases, these differences were not statistically significant (Table 1.9).

## Other cancers

Some women diagnosed with ovarian cancer will also be diagnosed with another cancer, either before they were diagnosed with the ovarian cancer, at the same time as the ovarian cancer diagnosis or after the ovarian cancer diagnosis. The following statistics show the frequency of diagnosis of another invasive cancer and the types of other cancers most frequently diagnosed.

- Of the 21,728 recorded women first diagnosed with ovarian cancer between 1982 and 2002 there were 11.5% (2,501 women) diagnosed with other cancers. For these women, there were 2,676 other cancers diagnosed (Table 1.10).
- Forty-seven per cent of these other cancers were diagnosed before the ovarian cancer was diagnosed, with the most common other cancers including breast cancer, colon cancer and melanoma (Table 1.10).



- Twenty-one per cent of these other cancers were diagnosed in the same month as the ovarian cancer, with the most common other cancers including uterine, colon and breast cancer (Table 1.10).
- Thirty-two per cent of these other cancers were diagnosed after the ovarian cancer, with the most common other cancers including breast cancer, colon cancer and melanoma (Table 1.10).

**Table 1.1: Incidence of ovarian cancer, 1983 to 2002**

	1983	1987	1992	1997	2002
<b>New cases</b>					
Ovarian cancer	862	931	1,045	1,083	1,273
<b>Age-standardised rate (number per 100,000 population<sup>(a)</sup>)</b>					
Ovarian cancer	12.5	12.4	12.6	11.6	12.1

(a) Standardised to the 2001 Australian standard population.

Source: National Cancer Statistics Clearing House, AIHW.

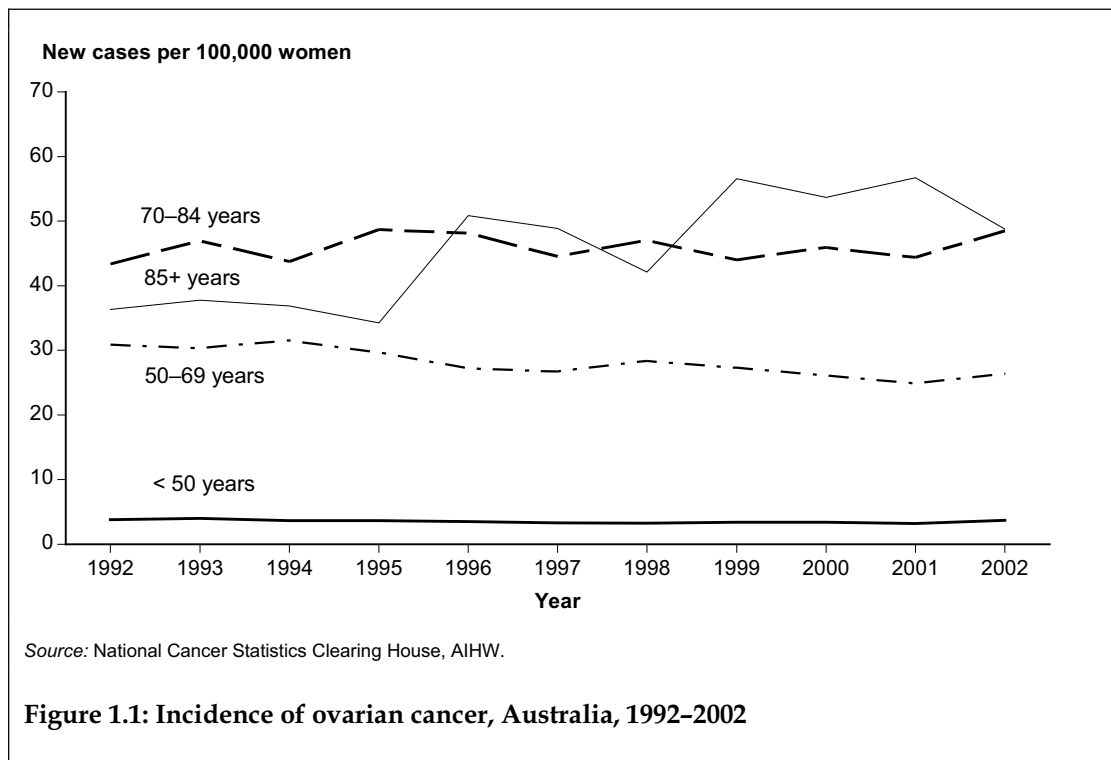
**Table 1.2: Incidence projections<sup>(a)</sup> for ovarian and other unspecified female genital organ cancer (ICD-10 C56 and C57), 1983 to 2011**

	2006	2008	2011
<b>New cases</b>			
Ovarian cancer	1,465	1,535	1,645
<b>Age-standardised rate (number per 100,000 population<sup>(b)</sup>)</b>			
Ovarian cancer	12.7	12.7	12.8

(a) AIHW projections.

(b) Standardised to the 2001 Australian standard population.

Source: National Cancer Statistics Clearing House, AIHW.



**Table 1.3: Incidence of ovarian cancer, 1992 to 2002**

Age groups	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>New cases</b>											
Under 20	17	14	13	10	12	8	8	12	15	8	17
20–24	8	18	12	18	11	9	11	13	7	12	14
25–29	13	17	14	9	20	20	22	23	17	21	17
30–34	24	31	26	23	19	22	21	22	16	21	19
35–39	32	29	41	38	25	30	36	26	40	28	35
40–44	58	45	46	53	51	42	45	45	54	50	56
45–49	93	106	88	90	95	90	75	89	83	78	97
50–54	102	102	117	116	107	120	111	124	132	111	123
55–59	112	95	102	115	102	104	123	120	104	114	128
60–64	117	104	131	102	119	108	110	138	132	133	148
65–69	135	162	139	137	112	116	146	105	113	115	119
70–74	129	141	133	131	151	130	137	142	138	120	127
75–79	106	96	103	132	119	128	131	135	155	146	144
80–84	57	88	76	92	90	83	100	74	80	102	136
85+	42	46	47	46	72	73	66	94	94	104	93
<b>Total</b>	<b>1,045</b>	<b>1,094</b>	<b>1,088</b>	<b>1,112</b>	<b>1,105</b>	<b>1,083</b>	<b>1,142</b>	<b>1,162</b>	<b>1,180</b>	<b>1,163</b>	<b>1,273</b>
<b>Age-specific rate (number per 100,000 population)</b>											
Under 20	0.7	0.6	0.5	0.4	0.5	0.3	0.3	0.5	0.6	0.3	0.7
20–24	1.1	2.5	1.7	2.6	1.6	1.3	1.7	2.0	1.1	1.9	2.1
25–29	1.9	2.5	2.1	1.3	2.8	2.8	3.0	3.1	2.3	3.0	2.5
30–34	3.3	4.2	3.5	3.1	2.6	3.1	3.0	3.1	2.2	2.8	2.5
35–39	4.7	4.2	5.9	5.3	3.4	4.0	4.8	3.4	5.3	3.7	4.7
40–44	9.0	7.0	7.0	7.9	7.5	6.1	6.4	6.3	7.4	6.7	7.4
45–49	17.3	18.5	14.8	14.6	14.9	14.0	11.5	13.4	12.3	11.4	14.0
50–54	24.0	23.5	25.8	24.4	21.5	22.3	19.4	20.7	21.2	17.1	18.9
55–59	30.6	25.3	26.4	29.1	25.0	24.7	28.4	26.5	22.0	23.0	23.9
60–64	32.0	28.9	36.7	28.6	33.4	29.7	29.5	35.9	33.3	32.6	35.3
65–69	38.2	45.6	39.2	38.7	31.6	32.9	41.8	30.3	32.7	33.1	33.5
70–74	44.1	46.5	41.9	40.6	46.2	39.6	41.4	42.6	41.4	35.8	38.1
75–79	46.3	41.7	45.2	56.6	48.8	49.9	48.7	48.1	53.9	50.0	48.9
80–84	37.6	55.6	45.5	53.4	51.0	46.1	54.9	40.4	42.1	50.5	64.3
85+	36.3	37.8	36.9	34.2	50.8	48.9	42.1	56.6	53.7	56.7	48.8

Source: National Cancer Statistics Clearing House, AIHW.

**Table 1.4: Ovarian cancer: age and risk of first diagnosis, 1983 to 2002**

	1983	1987	1992	1997	2002
Mean age at first diagnosis	59.6	60.3	60.7	62.6	63.2
Median age at first diagnosis	61	62	62	64	64
Risk of first diagnosis before age 75	1 in 97	1 in 95	1 in 96	1 in 111	1 in 108
Risk of first diagnosis before age 85	1 in 69	1 in 70	1 in 69	1 in 72	1 in 67

Source: National Cancer Statistics Clearing House, AIHW.

**Table 1.5: Histology subtypes of new cases of ovarian cancer, 2002**

Type of cancer	Number of cases	Per cent
Papillary serous cystadenocarcinoma	278	23.2
Serous cystadenocarcinoma, NOS	157	13.1
Adenocarcinoma, NOS	146	12.2
Endometrioid adenocarcinoma, NOS	92	7.7
Carcinoma, NOS	76	6.3
Serous surface papillary carcinoma	75	6.3
Clear cell adenocarcinoma, NOS	66	5.5
Mucinous adenocarcinoma	42	3.5
Neoplasm, malignant	34	2.8
Mullerian mixed tumour	29	2.4
Mucinous cystadenocarcinoma, NOS	24	2.0
Dysgerminoma	14	1.2
Papillary adenocarcinoma, NOS	14	1.2
Mixed cell adenocarcinoma	13	1.1
Teratoma, malignant, NOS	10	0.8
Granulosa cell tumour, malignant	9	0.8
Carcinoma, undifferentiated, NOS	8	0.7
Carcinosarcoma, NOS	7	0.6
Cystadenocarcinoma, NOS	7	0.6
Yolk sac tumour	5	0.4
Other	94	7.8
<i>Subtotal</i>	<i>1,200</i>	<i>100.0</i>
<b>Borderline tumours<sup>(a)</sup></b>		
Mucinous cystic tumour of borderline malignancy	40	54.8
Serous cystadenoma, borderline malignancy	27	37.0
Serous papillary cystic tumour of borderline malignancy	6	8.2
<i>Subtotal</i>	<i>73</i>	<i>100.0</i>
<b>Total</b>	<b>1,273</b>	<b>100.0</b>

(a) These tumour types were classified as malignant in the 2nd edition of the International Classification of Diseases for Oncology (ICD-O), on which all the tabulations in this publication are based. In the 3rd edition of the ICD-O these are now treated as non-malignant, and would not now be counted as 'cancers' under this more recent set of coding rules. These tumour types will not be included in future reports, which will be based on the 3rd edition rules.

Source: National Cancer Statistics Clearing House, AIHW.

**Table 1.6: Ovarian cancer incidence rates<sup>(a)</sup> for women: region, 1993–1997 and 1998–2002**

	Major cities	Inner regional	Outer regional	Remote	Very remote	All
Rate 1998–2002	12.0	11.6	11.0	11.2	12.4	11.8
95% CI	11.6–12.4	11.0–12.2	10.1–11.9	8.6–14.2	8.4–17.4	11.5–12.1
Rate 1993–1997	12.3	12.6	12.4	10.3	10.6	12.4
95% CI	11.9–12.7	11.9–13.3	11.4–13.5	7.8–13.3	6.6–15.9	12.0–12.7

(a) Standardised to the 2001 Australian standard population.

Source: National Cancer Statistics Clearing House, AIHW.

**Table 1.7: Incidence of ovarian cancer: state and territory averages, 1998–2002**

State	Females	
	Number	ASR <sup>(a)</sup>
NSW	383	11.0
Vic	301	11.8
Qld	252	14.2
WA	98	10.9
SA	97	11.1
Tas	30	11.5
ACT	17	12.4
NT	5	8.9

(a) Age-standardised rate, standardised to the 2001 Australian standard population.

Source: National Cancer Statistics Clearing House, AIHW.

**Table 1.8: Incidence of ovarian cancer: socioeconomic status<sup>(a)</sup>, 2000–2002**

	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile	All
New cases	823	707	671	708	691	3,600
ASR	12.4	12.5	12.3	11.8	12.6	12.3
95% CI	11.9–12.9	12.0–13.0	11.8–12.8	11.3–12.3	12.1–13.1	11.8–12.8

(a) The first quintile corresponds to the highest socioeconomic status and the fifth to the lowest socioeconomic status, using the ABS SEIFA Index of Socioeconomic Disadvantage.

Source: National Cancer Statistics Clearing House, AIHW.

**Table 1.9: Incidence of ovarian cancer, country of birth: New South Wales, 1993–2003**

<b>Region of birth</b>	<b>Number</b>	<b>Crude rate</b>	<b>ASR(A)</b>	<b>95% confidence interval</b>
Australia	1,206	9.7	9.8	9.2–10.3
New Zealand	28	9.6	11.5	7.4–16.9
UK and Ireland	161	20.6	12.4	10.0–15.1
Northern Europe	46	21.4	10.8	7.7–14.7
Southern Europe	97	21.4	11.2	8.5–14.4
Eastern Europe	48	21.1	10.8	7.6–14.7
Middle East	30	8.4	7.4	4.9–10.6
Asia	107	8.4	8.7	7.0–10.6
Other	50	10.8	12.0	8.7–16.1
All	1,773	10.7	10.0	9.6–10.5

*Note:* Rates are expressed per 100,000 population and age-standardised to the Australian 2001 standard population (ASR(A)).

*Source:* NSW Central Cancer Registry Reporting Module, 2005. Available at Cancer Institute NSW: <[www.statistics.cancerinstitute.org.au](http://www.statistics.cancerinstitute.org.au)>.

**Table 1.10: Breakdown and timing of the 25 most common other cancers in women diagnosed with ovarian cancer, 1982–2002**

ICD-10 code	Description	Before first ovarian cancer	Same month as first ovarian cancer	After first ovarian cancer	Total
C50	Breast	479	32	241	752
C54	Corpus uteri	83	296	41	420
C18	Colon	180	78	122	380
C43	Melanoma of skin	142	5	69	216
C34	Bronchus and lung	24	5	53	82
C20	Rectum	30	18	30	78
C53	Cervix uteri	27	26	4	57
C16	Stomach	12	7	26	45
C19	Rectosigmoid junction	19	6	19	44
C67	Bladder	26	5	13	44
C80	Unspecified site	13	3	23	39
C64	Kidney, except renal pelvis	13	13	12	38
C83	Diffuse non-Hodgkin lymphoma	21	2	14	37
C92	Myeloid leukaemia	2	2	29	33
C73	Thyroid gland	22	0	10	32
C91	Lymphoid leukaemia	22	2	8	32
C25	Pancreas	4	3	21	28
C90	Multiple myeloma and malignant plasma cell neoplasms	6	3	15	24
C00	Lip	15	1	7	23
C23	Gallbladder	10	6	2	18
C56	Ovary	0	13	3	16
C17	Small intestine	3	5	7	15
C71	Brain	2	1	12	15
C15	Oesophagus	6	0	8	14
C82	Follicular non-Hodgkin lymphoma	7	3	4	14
	All other cancers	79	26	75	180
	<b>Total</b>	<b>1,247</b>	<b>561</b>	<b>868</b>	<b>2,676</b>

Note: The counts are of cancers, not persons.

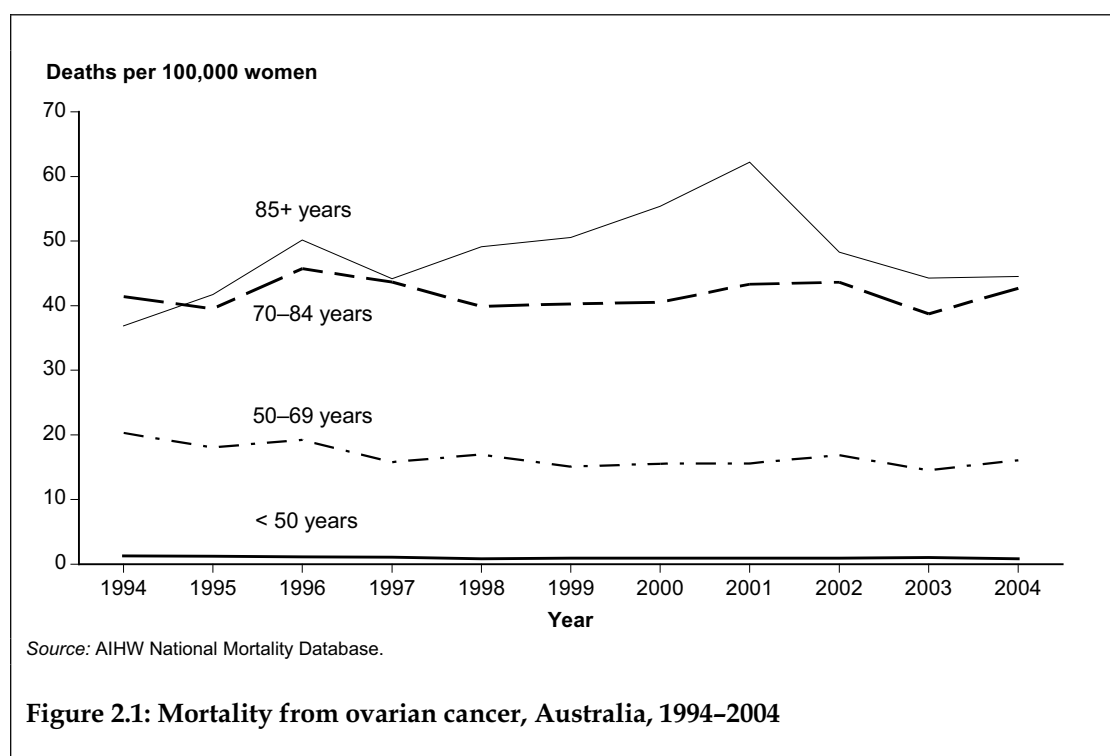
Source: National Cancer Statistics Clearing House, AIHW.

## 2 Mortality

Ovarian cancer was the sixth most common cause of cancer death in women in Australia in both 2002 and 2004.

The AIHW receives coded mortality data from the Australian Bureau of Statistics (ABS), which sources its data from the Registries of Births, Deaths and Marriages. The AIHW has electronic unit record data of all Australian registered deaths for the period 1964–2004, and summarised information for some causes of death going back to 1907.

This chapter details national ovarian cancer mortality statistics by sex, region, socioeconomic status, and Aboriginal and Torres Strait Islander status.



**Figure 2.1: Mortality from ovarian cancer, Australia, 1994–2004**

### Trends

- There were 851 deaths due to ovarian cancer in 2004 (Table 2.1), with an average of 49 additional cases per year from 2000–2004 in which ovarian cancer was an associated cause but not the underlying cause of death (Table 2.10). The ‘underlying cause’ of death is the disease or injury that initiated the train of events leading directly to death. An ‘associated cause’ is any other condition or event that is not the underlying cause but is still considered to contribute to the death.
- The age-standardised rate of mortality due to ovarian cancer has decreased since 1968 when ovarian cancer was first coded separately in Australia. In 1968 the age-standardised rate of mortality was 9.2 deaths per 100,000 females. In 1983 the rate was 8.8 deaths per 100,000 and by 2003 this had declined to 7.1 deaths per 100,000. In 2004 the age-standardised rate of mortality was 7.5 deaths per 100,000 (Figure 2.2, Table 2.1).



- Approximately 40% of deaths where ovarian cancer contributed to death but was not the underlying cause of death had cardiovascular disease as the underlying cause of death (Table 2.9). Ischaemic heart disease was the single greatest contributor to this group (Table 2.10).
- In cancer deaths where ovarian cancer contributed to death but was not the underlying cause of death, colorectal cancer was the most common underlying cause of death with 9 deaths in 2000–2004 (Table 2.11).
- Mortality rates were highest in the older age groups and lowest in all age groups under 40 years of age (Table 2.2, Figure 2.1).
- Overall, the average age of death due to ovarian cancer increased from 65 years in 1983 to 69.9 years in 2004 (Table 2.3).
- The median age of death due to ovarian cancer also increased, from 65 in 1983 to 71 in 2004 (Table 2.3).
- Australian females born in 2000–2004 have a life expectancy of 83.0 years. The risk for women of dying from ovarian cancer before the age of 75 has been declining, from 1 in 142 in 1983 to 1 in 176 in 2004 (Table 2.3). The risk of dying from ovarian cancer before the age of 85 experienced little change over this 20-year period; it was 1 in 91 in 1983 and 1 in 95 in 2004.

## **Geographic differences**

- There are no clear associations between ovarian cancer deaths and geographic categories, based on the two four-year periods of 1997–2000 and 2001–2004 (Table 2.4).
- Of the states and territories, Victoria has the highest age-standardised ovarian cancer mortality rate at 8.3 deaths per 100,000 population in 2000–2004 (Table 2.5).

## **Socioeconomic status**

- There were no significant differences between the five quintiles of socioeconomic status in 2000–2002, but the two least disadvantaged groups of women had the highest mortality rates (Table 2.6).

## **Aboriginal and Torres Strait Islander women**

- Aboriginal and Torres Strait Islander women had a nearly 40% higher age-standardised rate of ovarian cancer mortality than the Australian population as a whole over the 2000–2004 period (Table 2.7). This difference, however, is not statistically significant due to the small numbers of cases.

## **Country of birth**

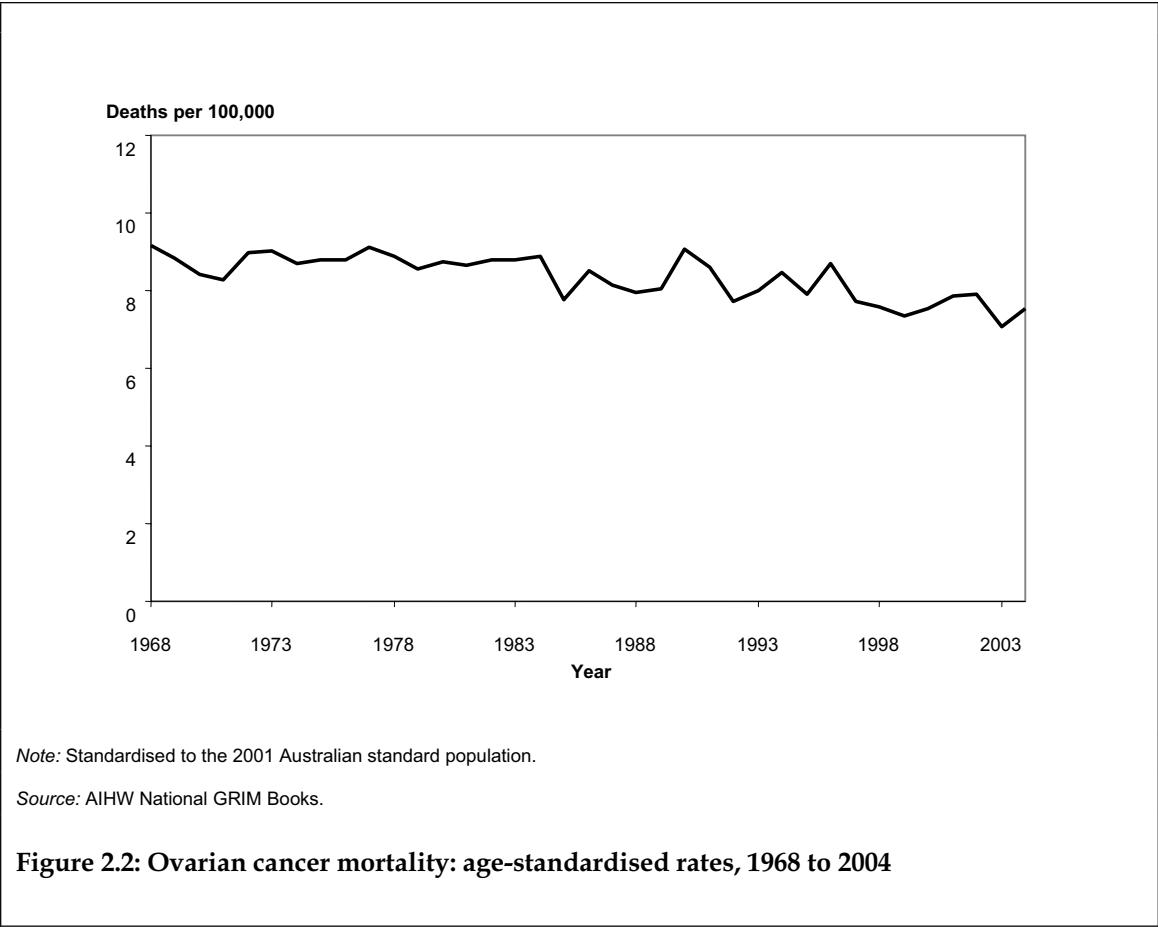
- Mortality rates vary greatly for Australian women born in different countries (Table 2.8). Australian women born in the UK and Ireland had a higher mortality rate, with 8.6 deaths per 100,000 females, than Australian-born women, with 7.5 deaths per 100,000 females, in 2000–2004. This result is marginally significant. All of the other investigated countries of birth had lower rates than Australian born women, but none of these results are significant.

**Table 2.1: Ovarian cancer mortality: age-standardised rates and numbers, 1983 to 2004**

1983	1987	1992	1997	2002	2003	2004
<b>Deaths</b>						
603	609	653	734	852	782	851
<b>Age-standardised rate (number per 100,000 population<sup>(a)</sup>)</b>						
8.8	8.1	7.7	7.7	7.9	7.1	7.5

(a) Standardised to the 2001 Australian standard population.

Source: AIHW National Mortality Database.



**Table 2.2: Ovarian cancer deaths and age-specific rates, 1994 to 2004**

Age groups	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<b>Deaths</b>											
Under 25	5	2	4	1	2	0	3	1	0	4	6
25–29	4	1	2	2	2	5	0	4	3	1	2
30–34	8	2	7	2	4	2	5	4	6	8	4
35–39	5	9	13	4	4	11	10	6	8	9	5
40–44	20	26	24	20	17	13	15	11	20	15	9
45–49	40	39	26	41	25	32	29	38	26	34	32
50–54	72	53	64	42	67	53	54	54	56	44	43
55–59	58	67	63	72	65	60	65	74	89	76	74
60–64	88	60	82	65	66	65	80	83	83	88	119
65–69	97	106	102	85	95	91	87	85	103	87	100
70–74	110	110	126	115	107	102	117	112	115	90	111
75–79	112	101	129	124	105	132	126	147	139	139	133
80–84	73	77	87	95	100	87	86	100	112	100	123
85+	47	56	71	66	77	84	97	114	92	87	90
<b>Total</b>	<b>739</b>	<b>709</b>	<b>800</b>	<b>734</b>	<b>736</b>	<b>737</b>	<b>774</b>	<b>833</b>	<b>852</b>	<b>782</b>	<b>851</b>
<b>Age-specific rate (number per 100,000 population)</b>											
Under 25	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
25–29	0.6	0.1	0.3	0.3	0.3	0.7	0.0	0.6	0.4	0.1	0.3
30–34	1.1	0.3	1.0	0.3	0.6	0.3	0.7	0.5	0.8	1.0	0.5
35–39	0.7	1.3	1.8	0.5	0.5	1.5	1.3	0.8	1.1	1.2	0.7
40–44	3.0	3.9	3.5	2.9	2.4	1.8	2.1	1.5	2.6	1.9	1.2
45–49	6.7	6.3	4.1	6.4	3.8	4.8	4.3	5.6	3.8	4.8	4.4
50–54	15.9	11.1	12.9	7.8	11.7	8.9	8.7	8.3	8.6	6.7	6.5
55–59	15.0	16.9	15.5	17.1	15.0	13.3	13.7	14.9	16.6	13.3	12.4
60–64	24.7	16.8	23.0	17.9	17.7	16.9	20.2	20.3	19.8	20.4	26.6
65–69	27.4	29.9	28.8	24.1	27.2	26.3	25.2	24.5	29.0	23.8	26.5
70–74	34.7	34.1	38.5	35.0	32.3	30.6	35.1	33.5	34.5	27.3	33.9
75–79	49.2	43.3	52.9	48.4	39.1	47.0	43.8	50.3	47.2	46.6	44.0
80–84	43.7	44.7	49.3	52.8	54.9	47.5	45.3	49.6	53.0	45.2	53.4
85+	36.9	41.7	50.1	44.2	49.1	50.6	55.4	62.2	48.3	44.3	44.5

Source: AIHW National GRIM Books.

**Table 2.3: Ovarian cancer mortality statistics, 1983 to 2004**

	1983	1987	1992	1997	2002	2004
Mean age of death	65.0	65.9	66.7	69.2	69.6	69.9
Median age of death	65	65	68	71	71	71
Risk of dying before age 75	1 in 142	1 in 157	1 in 159	1 in 178	1 in 171	1 in 176
Risk of dying before age 85	1 in 91	1 in 99	1 in 101	1 in 94	1 in 93	1 in 95

Source: AIHW National GRIM Books and AIHW National Mortality Database.

**Table 2.4: Ovarian cancer mortality rates<sup>(a)</sup>: region, 1997–2000 and 2001–2004**

	Major cities	Inner regional	Outer regional	Remote	Very remote	All
Rate 2001–2004	7.6	7.3	7.8	10.0	7.6	7.6
95% CI	7.3–7.9	6.8–7.9	7.0–8.6	7.3–13.2	3.8–12.7	7.3–7.8
Rate 1997–2000	7.6	7.7	7.1	4.8	8.4	7.5
95% CI	7.2–7.9	7.2–8.4	6.3–7.9	2.9–7.3	4.4–13.9	7.3–7.8

(a) Standardised to the 2001 Australian standard population.

Source: AIHW National Mortality Database.

**Table 2.5: Ovarian cancer deaths: average annual numbers and rates by state and territory, 2000–2004**

State	Number	ASR <sup>(a)</sup>
NSW	281	7.5
Vic	229	8.3
Qld	131	6.8
WA	72	7.4
SA	73	7.7
Tas	19	7.0
ACT	11	7.7
NT	3	5.6

(a) Age-Standardised Rate, standardised to the 2001 Australian standard population.

Source: AIHW National Mortality Database.

**Table 2.6: Ovarian cancer mortality rates<sup>(a)</sup>: socioeconomic status<sup>(b)</sup>, 2000–2002**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Rate 2000–2002	7.7	7.7	7.0	7.4	7.5
95% CI	5.8–9.9	5.6–9.9	5.1–9.0	5.5–9.6	5.5–9.7

(a) Standardised to the 2001 Australian standard population.

(b) ABS SEIFA Index of socioeconomic disadvantage. Quintile 1 is the group of women living in the least disadvantaged areas of Australia, quintile 5 the group living in the most disadvantaged areas.

Source: AIHW National Mortality Database.

**Table 2.7: Indigenous Australian<sup>(a)</sup> and Australian age-standardised mortality rates<sup>(b)</sup> for ovarian cancer, 2000–2004**

	Indigenous Australians	Australia
Rate 2000–2004	10.5	7.6
95% CI	6.3–16.1	7.3–7.8

(a) Based on Qld, WA, SA and NT registered deaths.

(b) Standardised to the 2001 Australian standard population.

Source: AIHW National Mortality Database.

**Table 2.8: Ovarian cancer mortality rates<sup>(a)</sup>: country of birth, 2000–2004**

	Australia	UK & Ireland	New Zealand	Italy	Greece	Vietnam	China	India
Rate 2000–2004	7.5	8.6	6.9	5.8	5.7	4.4	6.5	7.8
95% CI	7.2–7.8	7.8–9.4	5.1–9.2	4.6–7.3	4.1–7.8	2.3–7.3	4.4–9.2	5.0–11.7

(a) Standardised to the 2001 Australian standard population.

Source: AIHW National Mortality Database.

**Table 2.9: Annual deaths by broad underlying cause groups, where ovarian cancer is an associated cause but not the underlying cause, 2000 to 2004 combined**

Age group	Cancers (not ovarian cancer)	Cardiovascular diseases	Digestive diseases	Endocrine & metabolic diseases	Nervous system diseases	Respiratory system diseases	Other
<b>Average annual deaths</b>							
Under 50	0	0	0	0	0	0	0
50–54	1	0	0	0	0	0	0
55–59	1	0	0	0	0	0	0
60–64	1	1	1	0	0	0	0
65–69	1	1	0	0	0	0	0
70–74	1	2	1	0	0	1	2
75–79	2	3	1	0	0	1	1
80–84	2	7	1	0	0	1	1
85+	2	7	1	0	1	1	1
<b>Total</b>	<b>10</b>	<b>21</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>6</b>
<b>Age-specific rates per 100,000 population<sup>(a)</sup></b>							
Under 50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50–54	0.1	0.0	0.0	0.0	0.0	0.1	0.0
55–59	0.1	0.1	0.0	0.0	0.0	0.0	0.1
60–64	0.3	0.1	0.3	0.0	0.0	0.1	0.0
65–69	0.2	0.2	0.0	0.0	0.1	0.0	0.1
70–74	0.2	0.6	0.4	0.1	0.1	0.2	0.5
75–79	0.7	1.1	0.4	0.1	0.1	0.2	0.4
80–84	0.8	3.1	0.3	0.2	0.1	0.4	0.5
85+	0.8	3.7	0.4	0.2	0.3	0.3	0.6

(a) Standardised to the 2001 Australian standard population.

Source: AIHW National Mortality Database.

**Table 2.10: Annual deaths by selected underlying causes, where ovarian cancer is an associated cause but not the underlying cause, 2000 to 2004 combined**

Underlying cause of death	ICD10 codes	Average annual deaths	Per cent
Ischaemic heart disease	I20–I25	12	23.6
Cerebrovascular disease	I60–I69	5	9.3
Other forms of heart disease	I30–I52	2	3.7
Colorectal cancer	C18–C21	2	3.7
Diabetes	E10–E14	2	3.3
Renal failure	N17–N19	1	2.8
Breast cancer	C50	1	2.8
Septicaemia	A40–A41	1	2.0
Leukaemia	C91–C95	1	2.0
Pulmonary embolism	I26	1	2.0
Top 10 selected causes		27	55.3
<b>All causes</b>		<b>49</b>	<b>100.0</b>

Source: AIHW National Mortality Database.

**Table 2.11: Cancer deaths, where ovarian cancer is an associated cause but not the underlying cause, 2000 to 2004 combined**

Age group	Breast cancer	Colorectal cancer	Leukaemia	Multiple myeloma	NHL	Skin cancer	Other cancers
<b>Deaths in 2000–2004</b>							
Under 50	1	1	0	0	0	0	0
50–54	0	0	0	0	0	1	3
55–59	2	0	0	0	0	1	1
60–64	0	1	2	0	0	0	3
65–69	0	0	1	1	0	0	2
70–74	0	2	0	0	1	1	0
75–79	3	2	1	1	0	0	3
80–84	0	1	0	0	1	2	4
85+	1	2	1	1	1	0	2
<b>Total</b>	<b>7</b>	<b>9</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>18</b>
<b>Average annual age-specific rates per 100,000 population<sup>(a)</sup></b>							
Under 50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50–54	0.0	0.0	0.0	0.0	0.0	0.0	0.1
55–59	0.1	0.0	0.0	0.0	0.0	0.0	0.0
60–64	0.0	0.0	0.1	0.0	0.0	0.0	0.1
65–69	0.0	0.0	0.1	0.1	0.0	0.0	0.1
70–74	0.0	0.1	0.0	0.0	0.1	0.1	0.0
75–79	0.2	0.1	0.1	0.1	0.0	0.0	0.2
80–84	0.0	0.1	0.0	0.0	0.1	0.2	0.4
85+	0.1	0.2	0.1	0.1	0.1	0.0	0.2

(a) Standardised to the 2001 Australian standard population.

Source: AIHW National Mortality Database.

# 3 Survival

In general terms, survival is the length of time lived after the initial diagnosis of cancer. Relative survival analysis compares the survival of persons diagnosed with cancer (observed) with that experienced by the same age- and sex-matched population to which they belong (expected). The ratio of observed to expected is used to estimate the proportion of people whose risk of dying has been affected by their disease. This method of analysis does not require knowledge of the cause of death.

This chapter details national trend and age group relative survival statistics for ovarian cancer, Queensland ovarian cancer survival statistics by region and socioeconomic status, and international ovarian cancer survival data by stage at diagnosis.

The national relative survival statistics were derived from matching incident records from 1982 to 2002 in the NCSCCH with death records in the AIHW National Death Index from 1982 to 2005.

## Trends

The main trends in relative survival are as follows:

- There was a significant increase in relative survival after diagnosis of ovarian cancer in women between 1982–1986 and 1998–2002 (Table 3.1, Figure 3.1). One-year relative survival increased from 63.5% to 73.3% and five-year relative survival increased from 34.3% to 42.1%.
- Ten-year relative survival increased from 29.6% for women diagnosed in 1982–1986 to 32.2% for women diagnosed in 1992–1997, although the difference was not significant (Table 3.1).
- Fifteen-year relative survival increased from 27.3% for women diagnosed in 1982–1986 to 27.8% for women diagnosed in 1987–1991, although the difference was not significant (Table 3.1).
- The largest improvements in five-year relative survival between 1982–1986 and 1998–2002 were for women diagnosed with ovarian cancer in all age groups from 40 to 69 years (Table 3.2, Figure 3.2). For women aged 40–49 years five year relative survival improved from 45% in 1982–1986 to 63% in 1998–2002, for women 50–59 years from 37% to 51%, and for women 60–69 years from 28% to 43%. Furthermore, for women aged 60–69 years, the most common age group of diagnosis, the greatest improvement occurred in the most recent decade. In this age group, five-year relative survival improved from 33% for women diagnosed in 1992–1997 to 43% for women diagnosed in 1998–2002.

## Geographic differences and socioeconomic status

The only recent data on geographic differences and socioeconomic status are for Queensland.

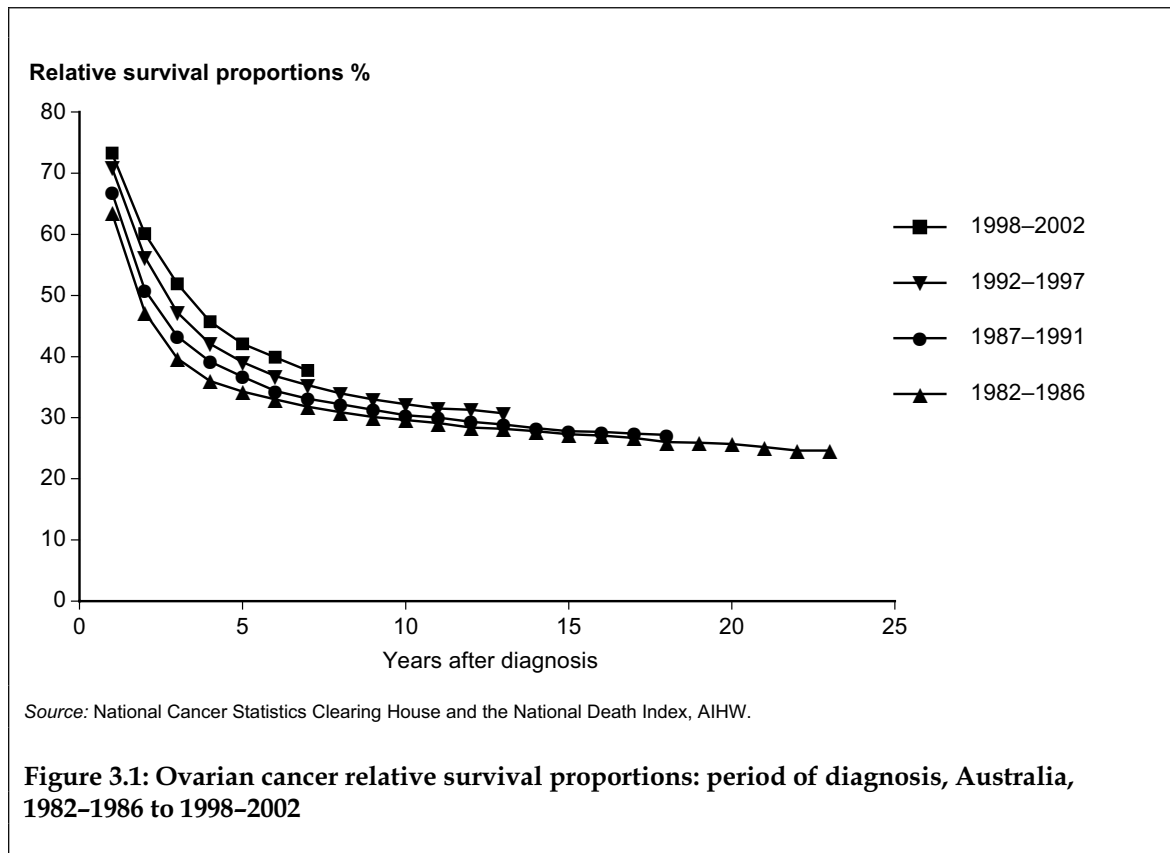
- *Major city* and *Inner regional* areas of Queensland had higher five-year relative survival rates of 55.6% and 56.8%, respectively, compared with *Outer regional* and *Remote* areas with five-year relative survival rates of 51.9% and 54.1%, respectively, in the 1996–2002 period (Table 3.3).

- Over the same period *Disadvantaged* areas of Queensland had the highest five-year relative survival rates with 62.4% survival compared to the *Middle 80% Socioeconomic status* areas with 54.9% survival and the *Affluent* areas of Queensland with 52.8% five-year relative survival after an ovarian cancer diagnosis (Table 3.3).

## Survival by stage

There are no Australian national data on survival by stage of ovarian cancer. Survival by stage data have been obtained from the United States of America (USA) and the United Kingdom (UK).

- In the USA, five-year relative survival was 44.7% for women diagnosed from 1996 to 2002 (National Cancer Institute 2006), similar to the rate of 42.1% for women diagnosed in Australia from 1998 to 2002. Five-year relative survival at the localised stage in the USA between 1988 and 2002 was 92.3% (Table 3.4). This fell sharply to 66.1% for women diagnosed at the regional stage, and just 27.5% for women diagnosed at the distant stage, when the cancer had metastasised.
- In England and Wales, five-year relative survival was 36% for women diagnosed with ovarian cancer from 1996 to 1999 (Cancer Research UK 2006). For women diagnosed from 1992 to 1996 in the Thames Cancer Registry area, five-year relative survival was 73% for women diagnosed at the local stage compared with just 16% for women diagnosed at the distant stage (Table 3.5).

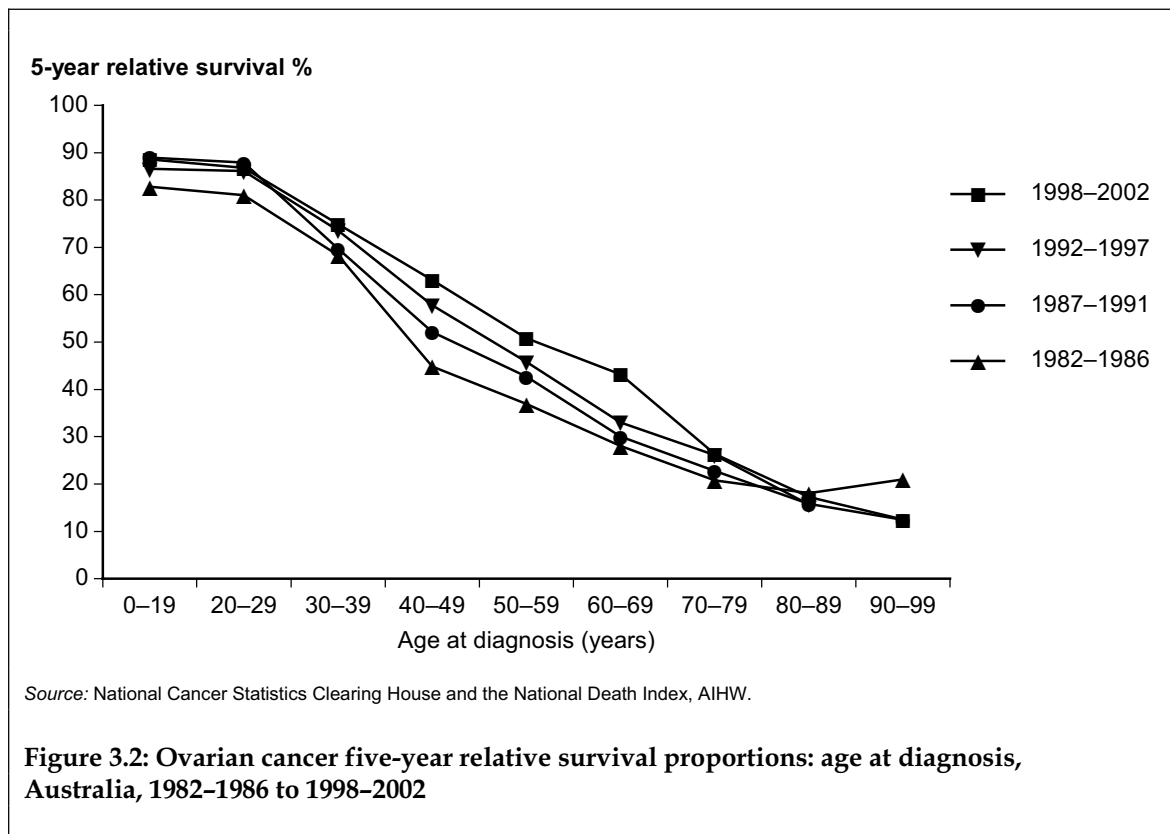




**Table 3.1: Ovarian cancer relative survival: period of diagnosis, Australia**

Years after diagnosis	1982–1986		1987–1991		1992–1997		1998–2002	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
1	63.5	62.1–65.0	66.9	65.6–68.3	70.9	69.7–72.0	73.3	72.1–74.4
2	47.2	45.7–48.7	50.9	49.4–52.3	56.3	55.1–57.6	60.1	58.8–61.4
3	39.7	38.2–41.2	43.3	41.9–44.8	47.2	46.0–48.5	51.9	50.5–53.2
4	36.0	34.5–37.5	39.2	37.8–40.6	42.1	40.8–43.3	45.7	44.4–47.1
5	34.3	32.8–35.8	36.7	35.3–38.2	39.1	37.9–40.4	42.1	40.7–43.5
6	33.0	31.5–34.5	34.4	32.9–35.8	36.8	35.5–38.0	39.9	38.5–41.4
7	31.8	30.3–33.2	33.1	31.7–34.5	35.3	34.1–36.6	37.7	36.1–39.3
8	30.9	29.4–32.4	32.2	30.8–33.6	34.0	32.7–35.2		
9	30.1	28.6–31.6	31.3	29.9–32.7	33.0	31.8–34.3		
10	29.6	28.1–31.1	30.4	29.0–31.8	32.2	30.9–33.4		
11	29.1	27.6–30.6	30.0	28.5–31.4	31.5	30.3–32.8		
12	28.4	26.9–29.9	29.3	27.9–30.7	31.3	30.0–32.6		
13	28.2	26.7–29.7	28.9	27.4–30.3	30.7	29.3–32.1		
14	27.8	26.3–29.3	28.3	26.9–29.8				
15	27.3	25.8–28.8	27.8	26.4–29.3				
16	27.1	25.6–28.6	27.7	26.3–29.2				
17	26.7	25.1–28.2	27.4	25.9–28.9				
18	26.0	24.5–27.6	27.2	25.6–28.7				
19	25.9	24.4–27.5						
20	25.7	24.2–27.3						
21	25.2	23.6–26.7						
22	24.6	23.0–26.2						
23	24.6	22.9–26.2						

Source: National Cancer Statistics Clearing House and the National Death Index, AIHW.



**Table 3.2: Ovarian cancer five-year relative survival proportions: age at diagnosis by period of diagnosis, Australia**

Age at diagnosis	1982–1986		1987–1991		1992–1997		1998–2002	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
0–19 years	82.8	72.5–93.2	89.0	81.3–96.8	86.6	78.8–94.4	88.6	80.6–96.6
20–29 years	81.0	74.0–88.1	87.9	82.2–93.6	86.1	80.8–91.3	86.8	81.3–92.4
30–39 years	68.3	62.5–74.0	69.7	64.1–75.2	73.6	68.9–78.3	74.9	69.5–80.3
40–49 years	44.8	40.6–49.1	52.1	48.0–56.1	57.8	54.4–61.1	63.1	59.2–67.0
50–59 years	36.9	33.8–39.9	42.7	39.4–45.9	45.8	43.1–48.6	50.8	47.7–53.9
60–69 years	28.0	25.3–30.7	30.0	27.4–32.5	33.0	30.6–35.5	43.2	40.2–46.2
70–79 years	20.8	17.8–23.9	22.8	19.9–25.6	26.1	23.6–28.6	26.4	23.7–29.1
80–89 years	18.1	12.6–23.6	15.8	11.1–20.4	15.7	12.2–19.2	17.3	13.6–21.0
90–99 years	21.0	0.0–49.1	12.4	0.0–26.1	—	—	12.5	2.5–22.5
<b>All ages</b>	<b>34.3</b>	<b>32.8–35.8</b>	<b>36.7</b>	<b>35.3–38.2</b>	<b>39.1</b>	<b>37.9–40.4</b>	<b>42.1</b>	<b>40.7–43.5</b>

Note: The relative survival estimates indicated by a dash (—) showed considerable statistical instability making interpretation difficult. The instability in this age–sex–site group may be due to the survival model’s handling a combination of small number of cases/deaths and or unstable background survival patterns resulting in invalid estimates. These results are therefore not presented here.

Source: National Cancer Statistics Clearing House and the National Death Index, AIHW.

**Table 3.3: Ovarian cancer age-standardised rate and five-year relative survival proportions by region and socioeconomic status, Queensland, 1996–2002**

Characteristic	Incidence		Five-year relative survival	
	Average number of cases per year	ASR	Per cent	
Geographic area				
Major city	130	14.1	55.6	
Inner regional	69	14.5	56.8	
Outer regional	35	12.4	51.9	
Remote	5	13.8	54.1	
Socioeconomic status (SES)				
Affluent	16	14.9	52.8	
Middle 80% SES	204	13.6	54.9	
Disadvantaged	19	17.3	62.4	

Source: Geographical differentials in cancer incidence and survival in Queensland, 1996 to 2002 (2005).

**Table 3.4: Ovarian cancer relative survival proportions by stage at diagnosis, United States of America, 1988–2002**

	Localised <sup>(a)</sup>	Regional <sup>(b)</sup>	Distant <sup>(c)</sup>	Unstaged
1-year	97.9	87.1	68.0	52.2
3-year	94.5	73.3	39.8	35.4
5-year	92.3	66.1	27.5	27.3
10-year	87.5	58.0	19.4	22.7

(a) Cancer is still confined to the primary site.

(b) Cancer has spread to regional lymph nodes or directly beyond the primary site.

(c) Cancer has metastasised.

Source: National Cancer Institute as at September 2006.

**Table 3.5: Ovarian cancer five-year relative survival proportions by stage at diagnosis for patients diagnosed in the Thames Cancer Registry area, 1992–1996**

Stage	Proportion of women diagnosed %	Five-year relative survival %	95% CI
Local	20	73	70.6–75.9
Direct extension	8	34	30.7–38.2
Regional lymph nodes involved	1	27	16.4–37.8
Distant metastases	40	16	14.7–17.8
Stage unknown	31	39	36.2–42.1

Source: Cancer Research UK as at March 2006.

## 4 Prevalence

Cancer prevalence in this report is the number of people who have been diagnosed with cancer who are alive at a given time.

In Table 4.1 the  $n$ -year prevalence ( $n = 1, 5, 10, 15$  and  $20$ ) is the number of surviving persons at the end of 2002 who received an ovarian cancer diagnosis in the last  $n$  years. Because the NCSCCH at the AIHW only contains complete incidence records for Australia back to 1983, it is only possible to calculate 20-year prevalence estimates for Australia at present.

The features of the data are:

- In 2002 there were 7,330 women alive who had been diagnosed with ovarian cancer in the previous 20 years (Table 4.1).
- In 2002 one-year prevalence of ovarian cancer was 1,035 women; five-year prevalence 3,373, 10-year prevalence 5,135, and 15-year prevalence of ovarian cancer was 6,400 (Table 4.1).
- Forty-six per cent of 20-year prevalent cases in 2002 were aged 50–69 years and a further 31% were aged 70 years and over (Table 4.2).

**Table 4.1: One-year, 5-year, 10-year and 20-year prevalence of ovarian cancer, Australia, 2002**

Time period	Number of surviving women
1-year prevalence	1,035
5-year prevalence	3,373
10-year prevalence	5,135
15-year prevalence	6,400
20-year prevalence	7,330

Source: National Cancer Statistics Clearing House, AIHW.

**Table 4.2: Twenty-year prevalence of ovarian cancer, by age group, Australia, 2002**

<b>Age group</b>	<b>Number</b>	<b>Per cent</b>
0–9	7	0.1
10–14	18	0.2
15–19	36	0.5
20–24	69	0.9
25–29	142	1.9
30–34	242	3.3
35–39	256	3.5
40–44	425	5.8
45–49	528	7.2
50–54	780	10.6
55–59	902	12.3
60–64	868	11.8
65–69	819	11.2
70–74	738	10.1
75–79	682	9.3
80–84	469	6.4
85+	349	4.8
<b>Total</b>	<b>7,330</b>	<b>100.0</b>

Source: National Cancer Statistics Clearing House, AIHW.

# 5 International comparisons

The International Agency for Research on Cancer (IARC) is part of the World Health Organization. Its mission is 'to coordinate and conduct research on the causes of human cancer, the mechanisms of carcinogenesis, and to develop scientific strategies for cancer control'.

It collates cancer incidence and mortality data for 27 cancers from countries around the world and publishes estimates for all countries in its GLOBOCAN database, which is publicly available on its website at <[www.iarc.fr](http://www.iarc.fr)>.

The following tables were extracted from the GLOBOCAN database and present comparative data on crude and age-standardised rates of incidence and mortality for ovarian cancer for selected countries and regions of the world. Numbers and rates are estimates for the middle of 2002, based on the most recent data available, generally three to five years earlier, so care should be taken in interpretation. Nevertheless they provide a good guide to how Australia compares with countries such as Canada, New Zealand, the United States and the United Kingdom, to the world as a whole, and to regions such as eastern, southern, western and northern Europe and South-East Asia.

## Main features

The main features of the data are as follows:

- Australia had a lower age-standardised incidence rate of ovarian cancer with 8.9 new cases per 100,000 population than the more developed countries of the world which had 10.2 new cases per 100,000 population in 2002 (Table 5.1).
- Australia's age-standardised incidence rate of 8.9 new cases per 100,000 population was lower than the United Kingdom with 13.4, New Zealand with 12.4, Canada with 11.6 and the United States of America with 10.6 new cases per 100,000 population in 2002.
- Similarly, Australia had a lower age-standardised rate of mortality from ovarian cancer with 4.9 deaths from ovarian cancer per 100,000 population than the more developed countries of the world with 5.7 per 100,000 population in 2002.
- Australia's death rate of 4.9 deaths per 100,000 population was also lower than the rates for the United Kingdom with 8.0, New Zealand with 6.4, the United States of America with 6.1 and Canada with 5.9 deaths from ovarian cancer per 100,000 population in 2002.

**Table 5.1: Global ranking of incidence and mortality for ovarian cancer, females, selected countries, 2002**

Population (female)	Incidence			Mortality		
	Numbers	Crude	ASR(W)	Numbers	Crude	ASR(W)
World	204,499	6.6	6.6	124,860	4.1	4.0
More developed countries	96,769	15.8	10.2	62,248	10.2	5.7
Less developed countries	107,541	4.4	5.0	62,512	2.5	2.9
Australia	1,235	12.6	8.9	772	7.9	4.9
Canada	2,661	16.9	11.6	1,536	9.8	5.9
New Zealand	320	16.5	12.4	184	9.5	6.4
United Kingdom	6,707	22.2	13.4	4,590	15.2	8.0
United States of America	22,491	15.4	10.6	14,461	9.9	6.1
Central & Eastern Europe	23,637	15.0	10.2	15,243	9.6	6.0
Northern Europe	10,531	21.7	13.3	7,188	14.8	7.9
South-Eastern Asia	16,880	6.3	7.2	9,262	3.5	4.1
Southern Europe	11,649	15.7	9.7	6,431	8.7	4.5
Western Europe	17,650	18.9	11.3	12,162	13.0	6.3

*Notes*

1. Cancer numbers and rates are estimates for the middle of 2002, from the most recent data available, generally 3–5 years earlier.
2. Rates are expressed per 100,000 populations and age-standardised to the year 2002 standard population of the corresponding country and to the World Standard Population (ASR (W)).

Source: GLOBOCAN 2002, IARC, 2005.

# 6 Hospital treatment

This chapter provides statistics on the number of separations, the average length of stay for each separation and the most common selected procedures performed on patients with a principal diagnosis of ovarian cancer (ICD-10 C56). Where separations are defined as the total number of episodes of care for admitted patients, including total hospital stays (from admission to discharge, transfer or death), or portions of hospital stays beginning or ending in a change of type of care (for example, from acute to rehabilitation). The information is derived from the AIHW's National Hospital Morbidity Database which covers diagnoses, other characteristics and treatment of admitted patients in public and private hospitals in Australia.

The separation rates are age-standardised to take into account changes in the age structure of admitted patients in the years 1995–96 to 2003–04. In addition, the National Hospital Morbidity Database records same-day patients with a hospital stay of less than one day.

The main trends are as follows.

## Separations and average length of stay, 1995–96 to 2003–04

- There has been very little change in the numbers of separations of women with a principal diagnosis of ovarian cancer in the period from 1995–96 to 2003–04, with 3,200 to 3,600 separations per year (Table 6.1).
- The age-standardised separation rate of 0.33 to 0.37 separations per 1,000 population was also relatively constant during this period (Table 6.1).
- The average length of stay across all ages increased from 6.2–6.6 days per separation in 1995–96 to 2001–02, to 6.9–7.0 days per separation in 2002–03 and 2003–04 (Table 6.1).

## Procedures

- The most common procedure performed in 2003–04 for women with a principal diagnosis of ovarian cancer was *Chemotherapy administration* (Block 1780) with 610 separations, followed by *Abdominal hysterectomy* (Block 1268) with 485 separations and *Salpingo-oophorectomy* (Block 1252) with 194 separations (Table 6.2).



**Table 6.1: Separations and average length of stay for female patients admitted with a principal diagnosis of ovarian cancer (C56), 1995–96 to 2003–04**

Age group	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
<b>Separations</b>									
Under 30	154	113	97	135	164	118	136	120	69
30–39	150	93	174	167	153	153	138	96	111
40–49	435	500	432	390	384	414	373	306	381
50–59	775	912	776	841	790	759	811	683	703
60–69	898	810	792	795	832	860	903	905	897
70–79	723	756	704	829	867	846	842	737	785
80+	224	232	277	292	347	340	435	370	377
<b>Total</b>	<b>3,359</b>	<b>3,416</b>	<b>3,252</b>	<b>3,449</b>	<b>3,537</b>	<b>3,490</b>	<b>3,638</b>	<b>3,217</b>	<b>3,323</b>
<b>ASR<sup>(a)</sup></b>	<b>0.37</b>	<b>0.37</b>	<b>0.35</b>	<b>0.37</b>	<b>0.37</b>	<b>0.36</b>	<b>0.37</b>	<b>0.33</b>	<b>0.33</b>
<b>Average length of stay (days)</b>									
Under 30	4.3	4.4	4.5	3.5	4.5	3.9	5.0	5.8	5.3
30–39	4.8	5.1	4.4	4.9	4.7	4.7	5.5	6.1	4.9
40–49	5.0	5.2	5.6	5.6	5.6	5.3	5.5	6.2	6.6
50–59	5.4	4.9	5.2	5.4	5.6	5.9	5.5	6.3	6.2
60–69	6.1	5.9	6.3	6.3	6.0	6.7	6.8	6.2	6.3
70–79	8.1	7.6	7.6	7.7	7.6	7.6	8.3	7.5	8.5
80+	10.0	13.0	9.9	10.7	10.5	9.7	9.3	10.7	10.8
<b>Total</b>	<b>6.2</b>	<b>6.6</b>	<b>6.2</b>	<b>6.3</b>	<b>6.4</b>	<b>6.3</b>	<b>6.6</b>	<b>7.0</b>	<b>6.9</b>

(a) Age-standardised rate, standardised to the 2001 Australian standard population.

Source: National Hospital Morbidity Database, AIHW.

**Table 6.2: Separations for female patients with a principal diagnosis of ovarian cancer (C56), most common procedures, 2002–03 and 2003–04**

Block number	Procedure description	2002–03	2003–04
1780	Chemotherapy administration	590	610
1268	Abdominal hysterectomy	526	485
1252	Salpingo-oophorectomy	166	194
1299	Other procedures on female genital organs	109	125
1243	Oophorectomy	70	45
1963	Computerised tomography of abdomen and pelvis	35	49
985	Laparotomy	29	28
988	Biopsy of abdomen, peritoneum or omentum	18	24
1244	Other excision procedures on ovary	15	17
1788	Megavoltage radiation treatment	9	20

Source: National Hospital Morbidity Database, AIHW.

# 7 Expenditure

This chapter describes ovarian cancer expenditure in 2000–01.

Expenditure for cancer and other neoplasms in 2000–01 was \$2.9 billion, which was 5.8% of total health expenditure allocated by disease.

## Main features

The main features of expenditure on ovarian cancer in 2000–01 were as follows:

- Total expenditure on ovarian cancer was \$25 million in 2000–01 (Table 7.1). Of this, \$19 million was spent on hospital admitted patients, \$1 million on out-of-hospital medical costs and \$2 million on pharmaceuticals requiring a prescription.
- Ovarian cancer accounted for 1.5% of new cases of cancer in 2001 and 2.5% of deaths, while 0.9% of total cancer expenditure in 2000–01 was for ovarian cancer (Table 7.2)
- In 2001 ovarian cancer had an estimated lifetime treatment cost of \$19,677 (Table 7.3).
- In 2000–01 there were 3,541 ovarian cancer admissions to hospital, 10,581 attendances at a hospital without admission, 10,103 attendances at an out-of-hospital medical service without a referral, 11,810 attendances at other medical services and 50,130 prescriptions of pharmaceuticals (Table 7.4).
- Total expenditure on ovarian cancer increased by 71% from \$14.9 million in 1993–94 to \$25.5 million in 2000–01 (Table 7.5)
- Expenditure per case of ovarian cancer increased by 45%, from \$13,600 in 1993–94 to \$19,700 in 2000–01.

**Table 7.1: Expenditure on ovarian cancer and on all cancers, health system costs by sector, 2000–01, and numbers of new cases and deaths in 2001 (\$ million)**

Condition	Admitted patients	Out-of-hospital medical	Pharmaceuticals requiring a prescription		Total expenditure	New cases in 2001	Deaths in 2001
				Other			
Ovarian cancer	19	1	2	4	25	1,295	933
<b>All cancers</b>	<b>1,716</b>	<b>343</b>	<b>167</b>	<b>693</b>	<b>2,919</b>	<b>452,538</b>	<b>37,615</b>

Source: AIHW disease expenditure database.

**Table 7.2: Ovarian cancer percentage of total expenditure, by sector, 2000–01**

Condition	Admitted patients	Out-of-hospital medical	Pharmaceuticals requiring a prescription		Total expenditure	New cases in 2001 <sup>(a)</sup>	Deaths in 2001
				Other			
Ovarian cancer	1.1	0.4	0.9	0.5	0.9	1.5	2.5
<b>All cancers</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

(a) Proportion of new cases not including non-melanoma skin cancer.

Source: AIHW disease expenditure database.

**Table 7.3: Estimated lifetime treatment cost of each cancer, 2000–01**

	Lifetime cost of cancer (\$) <sup>(a)</sup>
Leukaemia	51,196
Brain	40,732
Multiple myeloma	37,068
Larynx	34,413
Oesophagus	30,808
Bone and connective tissue	29,593
Non-Hodgkin's lymphoma	27,620
Mouth and oropharynx cancer	22,996
Bladder	22,915
Stomach	21,573
<b>Ovarian cancer</b>	<b>19,677</b>
Hodgkin's disease	18,998
Colorectal	18,246
Pancreatic	18,204
Gall bladder	18,141
Liver	18,046
Prostate	17,942
Cervical cancer	17,240
Lung	16,476
Kidney	15,892
Breast cancer	11,897
Uterine cancer	11,867
Thyroid	8,792
Testicular	5,805
Melanoma	3,341

(a) Total average cost of treatment across an entire lifetime. Total treatment cost in 2000–01 divided by new cases in 2001 gives an approximate estimate of lifetime costs per incident case where treatment costs, incidence and mortality rates have been steady over time.

Source: AIHW disease expenditure database.

**Table 7.4: Health service usage for ovarian cancer and all cancers, 2000–01**

	Hospitals		Out-of-hospital medical services			
	Admitted patient separations	Non-admitted patients occasions of service	Unreferred attendances	Other medical services <sup>(a)</sup>	Pharmaceuticals requiring a prescription	Other health professional attendances
Ovarian cancer	3,541	10,581	10,103	11,810	50,130	0
<b>All cancers</b>	<b>475,519</b>	<b>1,510,266</b>	<b>2,991,642</b>	<b>4,646,928</b>	<b>3,020,368</b>	<b>1,291,644</b>

(a) Other out-of-hospital medical services includes imaging, pathology and other medical services.

Source: AIHW disease expenditure database.

**Table 7.5: Change in treatment expenditures between 1993–94 and 2000–01 for ovarian cancer and all cancers, 2000–01 dollars**

Conditions	1993–94 <sup>(a)</sup>		2000–01		Change		
	Expend. per case (\$'000)	Total (\$ million)	Expend. per case (\$'000)	Total (\$ million)	\$ million	Per cent per case	Per cent total
Ovary	13.6	14.9	19.7	25.5	10.6	45	71
<b>All cancers</b>	<b>n.a.</b>	<b>1,690.1</b>	<b>n.a.</b>	<b>2,102.2</b>	<b>412.0</b>	<b>n.a.</b>	<b>24</b>
<b>All cancers excluding NMSC</b>	<b>18.8</b>	<b>1,476.4</b>	<b>20.8</b>	<b>1,837.7</b>	<b>361.3</b>	<b>10</b>	<b>24</b>

(a) 1993–94 expenditure expressed in terms of 2000–01 dollars. Health prices increased 20% between 1993–94 and 2000–01. The original 1993–94 expenditure has been increased by 20% to convert it to 2000–01 prices.

Source: AIHW disease expenditure database.

**Table 7.6: Health service expenditure and usage for ovarian cancer by age, 2000–01**

	0–4	5–14	15–24	25–34	35–44	45–54	55–64	65–74	75+	All ages
<b>Expenditure</b>	(\$ million)									
Admitted patient <sup>(a)</sup>	0.0	0.1	0.2	0.5	1.3	3.1	4.4	4.4	4.9	18.8
Unreferred attendance <sup>(b)</sup>	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.5
Out-of-hospital <sup>(c)</sup>	0.0	0.0	0.0	0.1	0.0	0.1	0.7	0.3	0.2	1.3
Prescription pharmaceutical <sup>(d)</sup>	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.7	0.3	1.5
<b>Total</b>	<b>0.0</b>	<b>0.1</b>	<b>0.2</b>	<b>0.7</b>	<b>1.4</b>	<b>3.4</b>	<b>5.4</b>	<b>5.5</b>	<b>5.5</b>	<b>22.2</b>
<b>Usage</b>	('000)									
Admitted patient services	0.0	0.0	0.0	0.1	0.3	0.6	0.9	0.8	0.8	3.5
Unreferred attendance services <sup>(e)</sup>	0.0	0.0	0.0	0.7	0.7	1.2	2.5	3.4	1.6	10.1
Out-of-hospital services <sup>(f)</sup>	0.0	0.0	0.0	2.0	0.7	1.2	8.0	6.0	4.1	21.9
Number of prescriptions <sup>(g)</sup>	0.0	0.0	0.0	3.3	3.0	1.8	7.1	22.9	11.7	50.1
<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>6.2</b>	<b>4.6</b>	<b>4.7</b>	<b>18.4</b>	<b>33.2</b>	<b>18.2</b>	<b>85.6</b>

(a) Includes estimates for private medical services in hospitals.

(b) Includes expenditure for general practitioner attendances.

(c) Includes unreferred attendances, imaging, pathology and other out-of-hospital medical services (i.e. referral to specialists).

(d) Includes all pharmaceuticals for which a prescription is needed, including private prescriptions and under-copayment prescriptions.

(e) Includes visits to a general practitioner.

(f) Includes unreferred attendances, imaging, pathology and other out-of-hospital medical services (i.e. referral to specialists).

(g) Includes all pharmaceuticals for which a prescription is needed, including private prescriptions and under-copayment prescriptions.

Source: AIHW disease expenditure database.

# Glossary

**Aboriginal and Torres Strait Islander:** a person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander person and is accepted as such by the community with which he or she is associated.

**Administrative databases:** observations about events that are routinely recorded or required by law to be recorded. Such events include births, deaths, hospital separations and cancer incidence. Administrative databases include the National Mortality Database, the National Hospital Morbidity Database and the National Cancer Statistics Clearing House Database.

**Age-specific rate:** a rate for a specific age group. The numerator and denominator relate to the same age group.

**Age-standardised rate:** weighted average of age-specific rates according to a standard distribution of the population by age to eliminate the effect of different age distributions and thus facilitate valid comparison of groups with differing age compositions.

**Average length of stay:** the average number of patient days for admitted patient episodes. Patients admitted and separated on the same day are allocated a length of stay of 1 day.

**Cancer (malignant neoplasm):** a term used to describe one of several diseases that result when the process of cell division, by which tissues normally grow and renew themselves, becomes uncontrolled and leads to the development of malignant cells. These cancer cells multiply in an uncoordinated way, independently of normal growth control mechanisms, to form a tumour. The tumour can expand locally by invasion or systemically by metastasis via the lymphatic or vascular systems. If left untreated, most malignant tumours eventually result in death.

**Cancer death:** a death where the underlying cause is indicated as cancer. People with cancer who died of other causes are not counted in the death statistics in this publication.

**Confidence interval:** a range determined by variability in data, within which there is a specified (usually 95%) chance that the true value of a calculated parameter (for example, relative risk) lies.

**Data:** refers to the building blocks of health information, including observations from administrative databases and health survey data sets.

**Incidence:** see *New cancer case*.

**Indigenous:** a person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander person and is accepted as such by the community with which he or she is associated.

**International Classification of Diseases:** WHO's internationally accepted classification of death and disease. The tenth revision (ICD-10) is currently in use.

**Invasive cancer:** a tumour whose cells have invaded healthy or normal tissue.

**Length of stay:** the length of stay of an overnight patient is calculated by subtracting the date the patient is admitted from the date of separation and deducting days the patient was on leave. A same-day patient is allocated a length of stay of one day.

**Lymph node:** masses of lymphatic tissue, often bean-shaped, that produce lymphocytes and through which lymph filters. These are located throughout the body.

**Mortality:** see *Cancer death*.

**New cancer case:** a person who has a new cancer diagnosed for the first time. One person can have more than one cancer and therefore may be counted twice in incidence statistics if it is decided that the two cancers are not of the same origin. This decision is based on a series of principles set out in more detail in a publication by Jensen et al. (1991).

**Population estimates:** official population numbers compiled by the Australian Bureau of Statistics at both state and territory and statistical local area levels by age and sex, as at 30 June each year. These estimates allow comparisons to be made between geographic areas of differing population sizes and age structures.

**Prevalence:** the number of instances of a specific disease or other condition in a given population at a designated time.

**Principal diagnosis:** the diagnosis established after study to be chiefly responsible for occasioning an episode of admitted patient care.

**Procedure block:** the block number is a means of numerically ordering groups of related procedure codes.

**Risk factor:** an attribute or exposure that is associated with an increased probability of a specified outcome, such as the occurrence of a disease. Risk factors are not necessarily the causes of disease.

**Separation:** the term used to refer an episode of care for an admitted patient, which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). Separation also means the process by which an admitted patient completes an episode of care either by being discharged, dying, transferring to another hospital or changing type of care.

**Separations:** the total number of episodes of care for admitted patients, which can be total hospital stays (from admission to discharge, transfer or death), or portions of hospital stays beginning or ending in a change of type of care (for example, from acute to rehabilitation) that cease during a reference period.

**Significant difference:** where rates are referred to as significantly different, or one rate is deemed significantly higher or lower than another, these differences are statistically significant. Rates are deemed statistically significantly different when their confidence intervals do not overlap, since their difference is greater than what could be explained by chance. See 'confidence intervals' for more information.

**Symptom:** any evidence of disease apparent to the patient.

**Unit record file:** observations containing person-specific records from health surveys and administrative databases that are unanalysed and not tabulated. This is the most basic form of data and cannot be accessed for general use without appropriate confidentiality measures being in place.

# References

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