



ACT
Government
Health

CANCER SURVIVAL AND PREVALENCE

in the ACT 1983–2012

Health Series Report No. 66

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Contents

1. Acknowledgements.....	3
2. Executive summary	3
3. Introduction.....	4
a. Purpose	4
b. Scope.....	4
4. Background.....	4
a. The Australian Capital Territory	4
b. The ACT Cancer Registry	6
c. Cancer	6
d. Cancer survival	6
e. Prevalence.....	7
f. Data sources.....	7
5. Trends in cancer survival outcomes.....	7
a. Which cancers had the highest and lowest survival rates?	7
b. Which cancers showed the most and least improvement in survival rates?	8
c. How does the ACT compare with Australia?.....	11
6. Survival and prevalence estimates of selected cancers.....	13
a. All Cancers (C00–C96 excluding C44).....	13
b. Bladder cancer (C67).....	17
c. Bowel cancer (C18–C20)	20
d. Brain cancer (C71).....	23
e. Breast cancer (female) (C50).....	26
f. Head and neck cancers (C01–C14, C30–C32).....	29
g. Kidney cancer (C64–C66, C68)	33
h. Leukaemias (C91–C95).....	36
i. Liver (C22)	39

j. Lung Cancer (C33, C34)	42
k. Melanoma of skin (C43)	45
l. Ovarian cancer (C56, C57.0–C57.7).....	48
m. Pancreatic cancer (C25).....	51
n. Prostate cancer (C61).....	54
o. Stomach cancer (C16)	56
p. Uterine cancer (C54, C55)	59
7. Appendices	62
a. ICD-10 Codes of cancer sites.....	62
b. Statistical methods.....	63
Data for Survival Analysis.....	63
Relative Survival	63
Limited Duration Prevalence.....	63
c. Incidence (2011–2015) and mortality (2010–2014) of cancer in the ACT	64
d. Comparison of cancer survival in the ACT using the cohort method	65
8. References.....	67

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2. Executive summary

a. What is survival and prevalence?

Cancer survival analysis estimates the probability of surviving beyond a given amount of time after a diagnosis of cancer. In this report, the relative survival approach was used to estimate cancer survival. Relative survival provides a measure of the survival of people diagnosed with cancer compared with that of the general population. Limited-duration prevalence is a measure of the number of people who were diagnosed with cancer within a given time period and who are still alive up to a specific date. This information is used by service planners and providers to ensure that future needs of cancer patients can be met in terms of health care facilities and services.

b. What is in this report?

This report presents the cancer incidence, prevalence and five-year survival estimates for the ACT population. Cancer survival for selected cancers and all cancers combined were estimated for three ten-year periods: 1983–1992, 1993–2002 and 2003–2012. For the period 2003–2012, estimates are reported by sex and age-group.

c. What were the results?

The estimates for 5-year relative survival for all cancers combined for persons improved from 56.9 % in 1983–1992 to 70.9% in 2003–2012. For the period 2003–2012 the 5-year survival estimates for all cancers combined were 69.9% for males, 72.1% for females and 70.9% for persons.

Prostate cancer showed the greatest improvement in 5-year survival outcomes, improving from 53.8% in 1983–1992 to 94.9% in 2001–2012. This was followed by bowel cancer and all leukaemias.

There was very little or no change between the two periods (1983–1992 and 2001–2012) for melanoma, and cancers of the liver, bladder, pancreas, head and neck, and brain. Of these cancers, melanoma has high survival, however cancers of the liver, pancreas and brain have low survival.

Generally ACT survival estimates are similar to, or better than estimates for Australia.

At the end of 2012 there were 9,213 people who had been diagnosed with cancer in the ACT in the previous 10 years.

3. Introduction

a. Purpose

This survival analysis provides up-to-date cancer survival estimates for the ACT population. These statistics are important for monitoring cancer control efforts, as well as effective treatment and management of cancers in the ACT. The analysis also allows for comparisons of outcomes with other jurisdictions and Australia as a whole.

b. Scope

The study population is ACT residents diagnosed with cancer between 1982 and 2012. Estimates are provided for all cancers combined and for the most common cancers. The survival outcomes in this report have been estimated using relative survival methods. Five-year survival estimates are provided for three ten-year periods: 1983–1992, 1993–2002 and 2003–2012. For the most recent period 2003–2012, estimates are also reported for males, females and persons, and age-group. Limited duration prevalence is also presented.

It should be noted that it is not possible to provide reliable survival estimates for cancers with low numbers, particularly for the ACT which has a relatively small population. For the same reason, it is also not possible to obtain reliable survival estimates for the ACT by socioeconomic status, remoteness or cancer sub-types. It is also not possible to do separate analyses for ACT residents of Aboriginal or Torres Strait Islander status because of the small numbers. In addition, since Aboriginal or Torres Strait Islander status is not collected routinely by pathologists it is currently not complete on the ACT Cancer Registry. The ACT Cancer Registry does not contain clinical data such as stage, treatment and recurrence, so it is also not possible to do any analysis by these variables at this time.

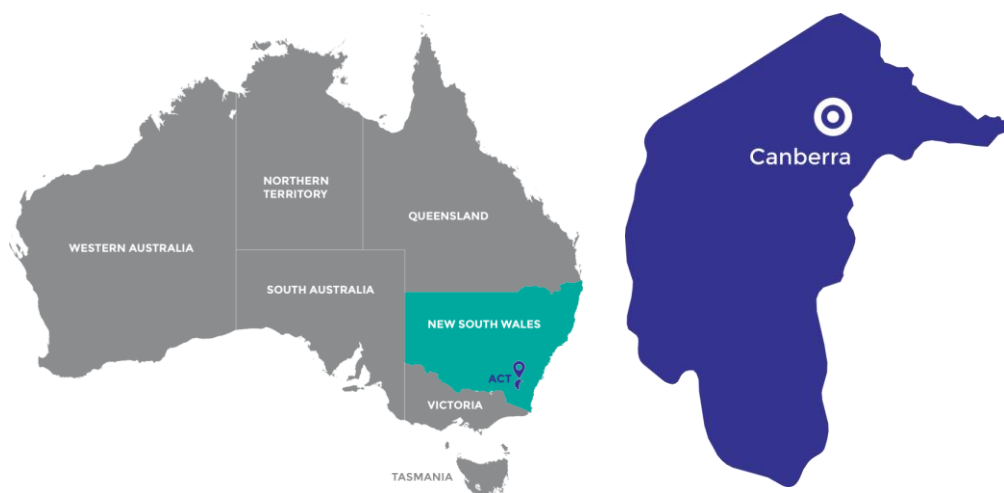
Comparisons will be made between survival estimates for the ACT and for Australia.

4. Background

a. The Australian Capital Territory

The ACT is a small jurisdiction. Its only city is Canberra, Australia's capital city and the seat of the Australian government. It is an island within the state of New South Wales.

Figure 1: Maps showing location of the ACT within Australia and Canberra within the ACT

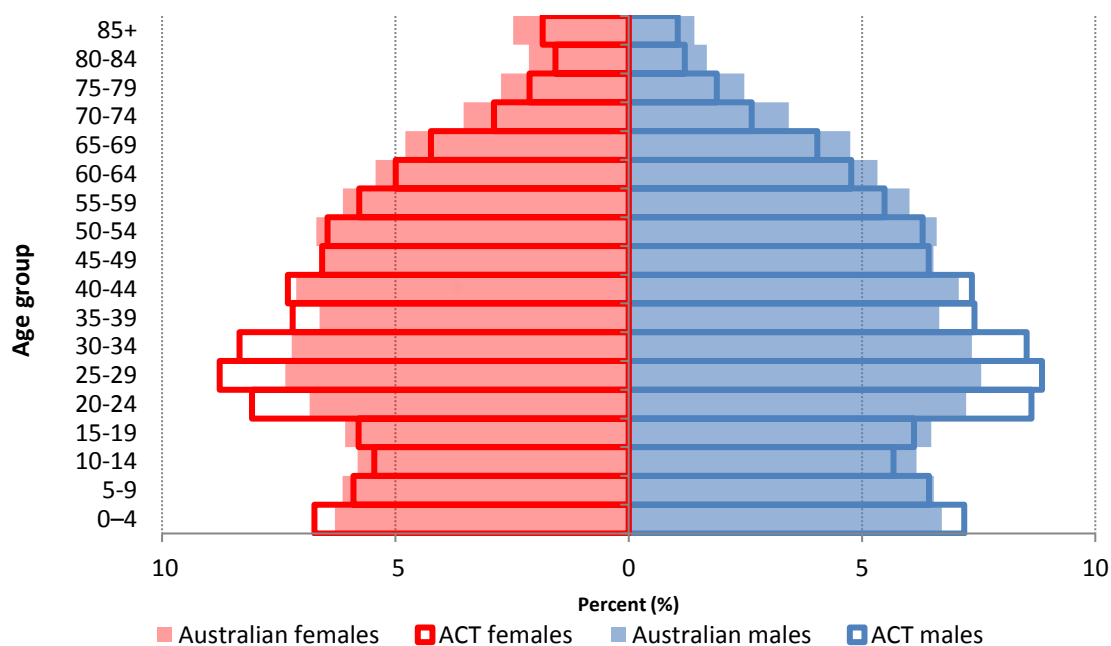


In 2014, the estimated resident population of the ACT was 386,000, most of whom lived in Canberra. The proportion of young adults (20–34) was high compared to the rest of Australia and accounted for 26% of the population (see Figure 2). While the proportion of the population aged 65 and over is increasing, in 2014 this proportion (12%) was lower than that for Australia (15%) (1).

At 30 June 2011 it was estimated that 1.7% of the ACT resident population was Aboriginal and/or Torres Strait Islander (2).

The ACT has a relatively high socio-economic status with median weekly income and education well above the national average.

Figure 2: Estimated Resident population by sex, ACT and Australia, 2014



Source: ABS 3235.0 - Population by Age and Sex, Regions of Australia, 2014

b. The ACT Cancer Registry

The ACT Cancer Registry is a population-based cancer registry and has been operational since 1983, though notification of cancer did not become mandatory in the ACT until 1994. All new cases of cancer in ACT residents are registered (excluding non-melanoma skin cancers) and all deaths of people with cancer are registered. Mandatory notifiers in the ACT include pathologists, hospitals and nursing homes.

The information collected by the Registry is used to monitor cancer trends in the ACT, to plan for services for cancer control and care, and to evaluate cancer treatment and programs. It also contributes data to Australia-wide reporting on the number of people with cancer and their outcomes.

The ACT Cancer Registry data is coded under contract by Cancer Institute NSW alongside the NSW Cancer Registry.

c. Cancer

Cancer is a group of diseases which occurs when cells multiply in an uncontrolled way because of a mistake in the cells' genetic blueprints. Cancer describes a collection of these cells. These abnormal cells can damage the surrounding tissues and spread to other parts of the body. Cancer cells which do not spread are benign. Some benign tumours may progress to cancer if not treated. Cancer cells which are confined to the original site are known as cancer in situ. If the cancer cells do spread, the tumour is malignant. Since cancerous cells can occur in almost any type of tissue, anywhere in the body, cancer refers to about 100 different diseases. Metastasis occurs when cancer cells travel to a new organ (via the bloodstream or lymphatic system) to form secondary tumours. (3, 4)

Cancers are coded according to the location in the body in which the disease began (site) or by the type of cell involved (histology). The original site of the cancer is referred to as the primary site. All cancers included in this report are primary, invasive tumours, that is, no secondary, recurrent or benign tumours are included. (5) Cancers were coded according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10). Histologies were coded according to the International Classification of Diseases for Oncology (ICD-O-3). Appendix 7(a) lists the cancer types included in this report along with the relevant ICD-10 code.

d. Cancer survival

Cancer survival analysis estimates the probability of surviving beyond a given amount of time after a diagnosis of cancer. In this report, the relative survival approach was used to estimate cancer survival. Relative survival provides a measure of the survival of people diagnosed with cancer compared with that of the general population. It is calculated as the ratio between the observed survival of those diagnosed with cancer and the expected survival of the general ACT population, matched for sex, age and calendar year.

It is important to be aware of lead-time bias when reading this report, particularly for cancers for which there is a national screening program. Since survival is based on the time between cancer diagnosis and death, if cancers are detected earlier through screening for

example, then survival time appears to increase. Lead time is the amount of time by which the diagnosis is advanced due to screening (6). There are three national cancer screening programs in Australia: BreastScreen Australia, the National Bowel Cancer Screening Program and the National Cervical Screening Program (7). While there is no national population-based screening program for prostate cancer, there are a significant number of prostate specific antigen tests undertaken in Australia and so lead-time bias is also a concern for prostate cancer.

Tables are presented in Section 6 (Survival and Prevalence Estimates of Selected Cancers) for all cancers and selected cancers. The codes given for each cancer are ICD-10 codes. For details of the methods used in this report see Appendix b.

e. Prevalence

To provide context to survival estimates, cancer incidence and limited-duration prevalence in the ACT are presented. Limited-duration prevalence represents the number of people who were diagnosed with cancer within a given time period and who are still alive up to a specific date, in this case 31 December 2012.

Tables are presented in Section 6 (Survival and Prevalence Estimates of Selected Cancers) for all cancers and selected cancers. The codes given for each cancer are ICD-10 codes.

For details of the methods used in this report see Appendix b.

f. Data sources

The ACT Cancer Registry is only notified of cancer and non-cancer deaths registered in the ACT. Therefore, to conduct this analysis the ACT Cancer Registry data was linked with data from the National Death Index (NDI) to identify incident cases registered on the ACT Cancer Registry but who died interstate. The linked data allows us to perform an accurate cancer survival analysis and provide a more complete representation of cancer patient outcomes.

The expected survival for the general ACT population was estimated from life tables published by the Australian Bureau of Statistics (8). Population data was also sourced from the ABS.

5. Trends in cancer survival outcomes

a. Which cancers had the highest and lowest survival rates?

For the period 2003–2012 the 5-year survival estimates for all cancers combined were 69.9% for males, 72.1% for females and 70.9% for persons.

Table 1 shows the five cancers with the highest survival estimates for males, females and persons, and Table 2 summarises the five lowest survival estimates. It should be noted that it is not possible to provide reliable survival estimates for cancers with low numbers, particularly for the ACT which has a relatively small population.

Table 1: Cancers with the five highest survival estimates, males, females, persons, ACT, 2003–2012

5-year relative survival (%)					
Males		Females		Persons	
Prostate	94.9	Melanoma	93.4	Prostate	94.9
Melanoma	88.6	Breast	91.5	Breast	91.5
Kidney	69.3	Uterine	76.0	Melanoma	90.8
Bowel	68.4	Bowel	72.5	Uterine	76.0
All leukaemias	63.9	Kidney	70.5	Bowel	70.3

Note: This table is based on cancers for which it was possible to calculate survival estimates for the ACT. Please note that there are other cancers which are likely to have high survival estimates (eg thyroid), but it was not possible to calculate reliable estimates because of small numbers of these cancers in the ACT.

Source: ACT Cancer Registry

Table 2: Cancers with the five lowest survival estimates, males, females, persons, ACT 2003–2012

5-year relative survival (%)					
Males		Females		Persons	
Pancreas	11.1	Pancreas	8.5	Pancreas	9.6
Liver	13.8	Liver	15.6	Liver	14.7
Lung	17.1	Lung	21.8	Lung	19.2
Brain	22.6	Stomach	27.6	Brain	25.5
Stomach	28.6	Brain	28.7	Stomach	28.4

Note: This table is based on cancers for which it was possible to calculate survival estimates for the ACT. Please note that there are other cancers which are likely to have low survival estimates (eg mesothelioma), but it was not possible to calculate reliable estimates because of small numbers of these cancers in the ACT.

Source: ACT Cancer Registry

While it is not possible to provide reliable estimates for the rarer cancers for the ACT, it is possible to provide them for Australia. For Australia, for the period 2003–2012, the cancers with the highest 5-year survival were testicular cancer, cancers of the lip, prostate and thyroid and melanoma of the skin. The cancers with the lowest 5-year survival were pancreatic cancer, mesothelioma, cancers of unknown primary site, liver and lung (5).

b. Which cancers showed the most and least improvement in survival rates?

Table 3 presents a summary of the change in 5-year survival estimates between the periods 1982–1992 and 2003–2012 by cancer type. This is also shown graphically in Figure 3.

The estimates for 5-year relative survival for all cancers combined improved from 56.9 % in 1983–1992 to 70.9% in 2003–2012.

Prostate cancer showed the greatest improvement in 5-year survival, improving from 53.8% to 94.9%. This was followed by bowel cancer and all leukaemias. These improvements are all statistically significant.

There was very little or no change between the two periods for melanoma, and cancers of the liver, bladder, pancreas, head and neck, and brain. Of these cancers, melanoma has high survival, however cancers of the liver, pancreas and brain have low survival.

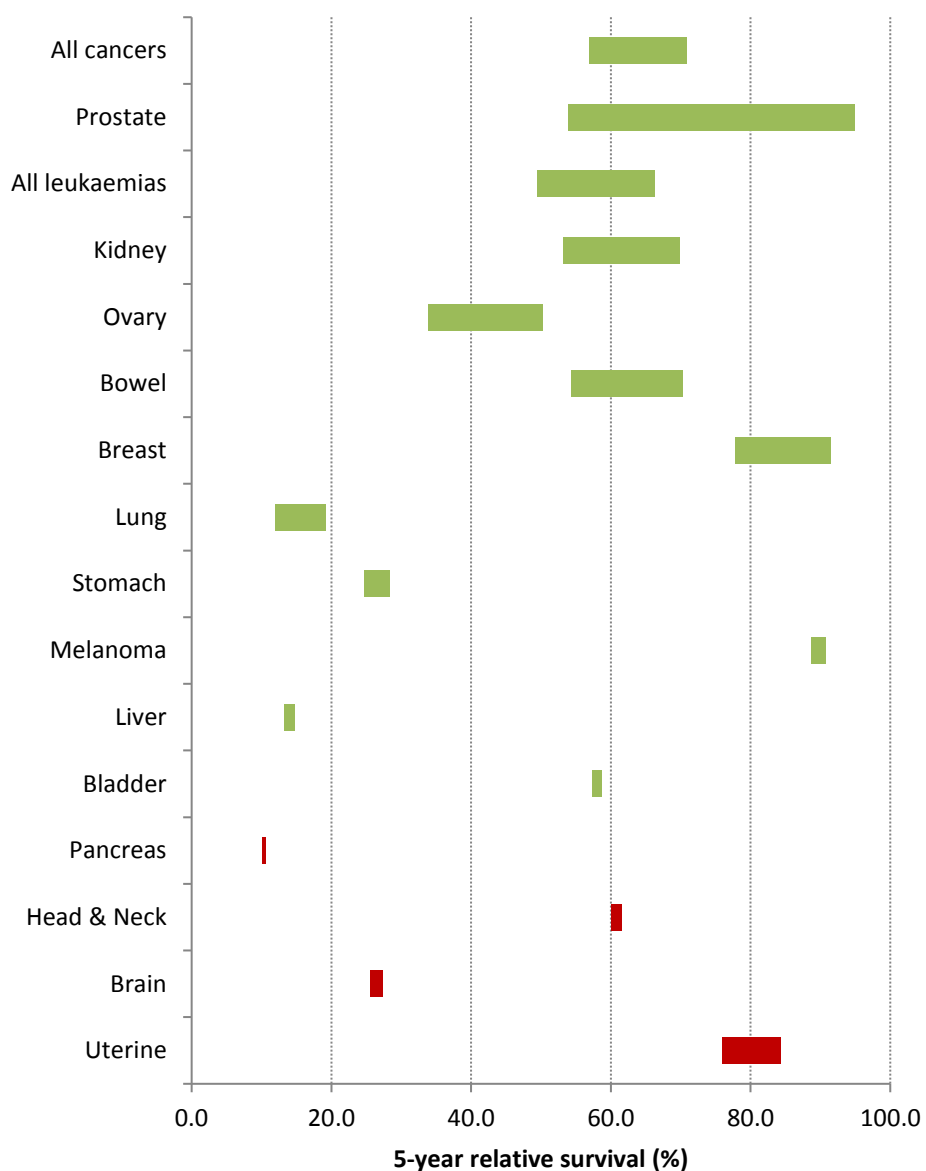
Table 3: Summary of survival trends, persons, ACT, 1983–1992 to 2003–2012

Cancer type	5-year relative survival (%)		
	1983-1992	2003-2012	Difference
All cancers	56.9	70.9	14.0*
Prostate	53.8	94.9	41.1*
All leukaemias	49.4	66.3	16.9*
Kidney	53.1	69.9	16.7*
Ovary	33.9	50.4	16.5
Bowel	54.3	70.3	16.0*
Breast	77.8	91.5	13.7*
Lung	12.0	19.2	7.2*
Stomach	24.8	28.4	3.6
Melanoma	88.7	90.8	2.0
Liver	13.2	14.7	1.5
Bladder	57.4	58.7	1.3
Pancreas	10.1	9.6	-0.5
Head & Neck	61.6	60.1	-1.5
Brain	27.3	25.5	-1.8
Uterine	84.3	76.0	-8.3

Note: * denotes a statistically significant difference

Source: ACT Cancer Registry

Figure 3: Summary of survival trends, persons, ACT, 1983–1992 to 2003–2012



Notes:

1. Green bars indicate the improvement in survival estimates between the periods 1982–1992 and 2003–2012, ie the left hand end of the bar gives the 1982–1992 estimate and the right hand end gives the 2003–2012 estimate.
2. Red bars indicate worsening survival estimates between the periods 1982–1992 and 2003–2012, ie the right hand end of the bar gives the 1982–1992 estimate and the left hand end gives the 2003–2012 estimate.

Source: ACT Cancer Registry

c. How does the ACT compare with Australia?

Table 4 below shows a comparison of ACT 5-year survival estimates for the period 2003–2012 with 5-year survival rates for Australia for the period 2006–2010. It is not possible to compare all cancer types because of differences in the way specific cancers were grouped for survival analysis. Generally ACT survival estimates are similar to, or better than estimates for Australia.

Table 4: Comparison of ACT 5-year relative survival estimates for 2003–2012 with Australian estimates for 2006–2010, persons

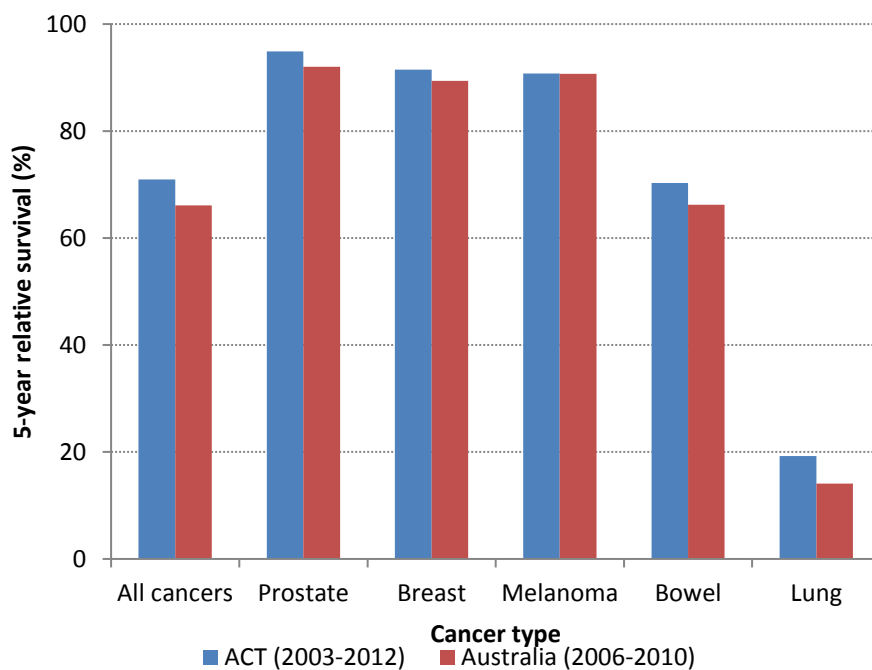
Cancer type	5-year relative survival (%)	
	ACT 2003–2012	Australia ⁽⁵⁾ 2006–2010
All cancers	70.9	66.1
Bladder	58.7	57.5
Bowel	70.3	66.2
Brain	25.5	21.9
Breast	91.5	89.4
Kidney	69.9	71.9
Liver	14.7	15.5
Lung	19.2	14.1
Melanoma	90.8	90.7
Ovary	50.4	43.3
Pancreas	9.6	5.2
Prostate	94.9	92.0
Stomach	28.4	26.7
Uterine	76.0	82.0

Note: Estimates for Australia include the ACT.

Source: ACT Cancer Registry, AIHW Australian Cancer Database (5)

The five most common cancers in the ACT during 2010–2014 for persons were prostate, breast, bowel, melanoma and lung. Figure 4 shows a comparison between ACT (2003–2012) and the latest available Australian (2006–2010) 5-year survival estimates from the Australian Institute of Health and Welfare (5) for all cancers and the most common cancers. Estimates for the ACT are calculated over a 10-year period, whereas estimates for Australia are for a 5-year period. This is because of the relatively small number of cancer cases in the ACT.

Figure 4: Comparison of ACT 5-year relative survival estimates for 2003–2012 with Australian estimates for 2006–2010, selected cancers, persons



Source: ACT Cancer Registry, AIHW Australian Cancer Database (5)

6. Survival and prevalence estimates of selected cancers

a. All Cancers (C00–C96 excluding C44)

In the ACT 30,471 new cases of cancer were diagnosed between 1983 and 2012. During that time there were 13,696 deaths of people who had been diagnosed with cancer (Table 5).

At the end of 2012 there were 9,213 people alive who had been diagnosed with cancer in the previous 10 years (Table 5).

Survival outcomes for all cancers combined has improved considerably over time. For the most recent period (2003–2012), 5-year relative survival for all cancers combined was 70.9%. This was a statistically significant improvement from 63.5% in the previous period (1993–2002), which in turn was a significant improvement from 56.9% (1983–1992) (Table 8 and Figure 5). There was no difference in survival between males and females (Table 7 and Figure 6).

Younger people had better survival than older people for all cancers combined. There were significant differences in survival between different age groups with those aged 0–44 having a 5-year relative survival of 86.0% compared with 78.2% for 45–64 year olds and 60.5% for those aged 65 and above (Table 7 and Figure 7).

Clinical interpretation: The improved cancer survival over time reflects a combination of improved treatment and earlier diagnosis across many cancer types. Survival rates in the ACT are at least as high as those for Australia as a whole. Compared with younger persons, there is a substantial disadvantage in survival for persons affected by cancer over the age of 65 years. This is in part due to older persons not undergoing more complex cancer treatments because of the risk of complications. Improving outcomes in this group remains a major challenge in cancer care.

Table 5: Summary of new cases, deaths and prevalence for all cancers combined, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths* 1983–2012	1-year prevalence as at end 2012	5-year prevalence as at end 2012	10-year prevalence as at end 2012
Males	16,076	7,552	736	2,930	4,776
Females	14,395	6,144	704	2,686	4,437
Persons	30,471	13,696	1,440	5,616	9,213

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

* Deaths from all causes for people diagnosed with cancer since 1982.

Source: ACT Cancer Registry

Table 6: Relative survival by years after diagnosis for all cancers combined, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	83.9	83.3–84.6
2	77.6	76.8–78.3
3	74.2	73.4–75.1
4	72.3	71.4–73.2
5	70.9	70.0–71.8
6	69.5	68.5–70.4
7	68.7	67.7–69.7
8	67.7	66.7–68.7
9	66.8	65.8–67.9
10	65.9	64.8–67.0

Source: ACT Cancer Registry

Table 7: 5-year relative survival for all cancers combined, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	69.9	68.6–71.2
Female	72.1	70.8–73.3
Age at diagnosis		
0–44	86.0	84.1–87.7
45–64	78.2	77.0–79.3
65+	60.5	59.0–62.1

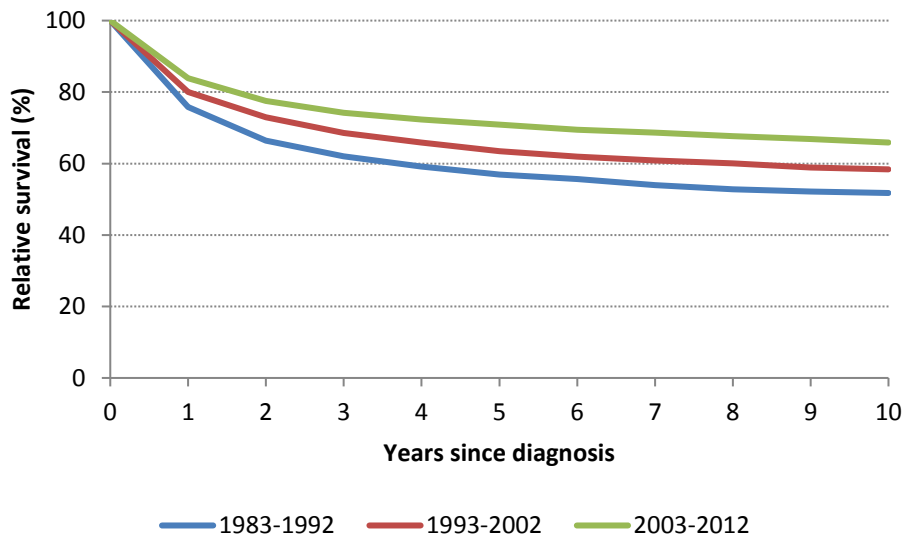
Source: ACT Cancer Registry

Table 8: 5-year relative survival for all cancers combined, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	56.9	55.4–58.4
1993–2002	63.5	62.3–64.6
2003–2012	70.9	70.0–71.8

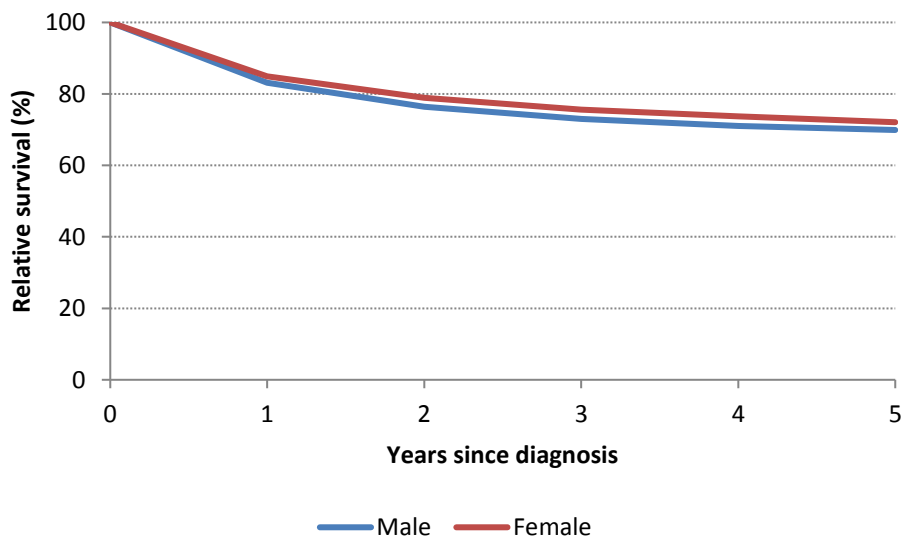
Source: ACT Cancer Registry

Figure 5: Survival by period, all cancers combined, persons, ACT, 1983–2012



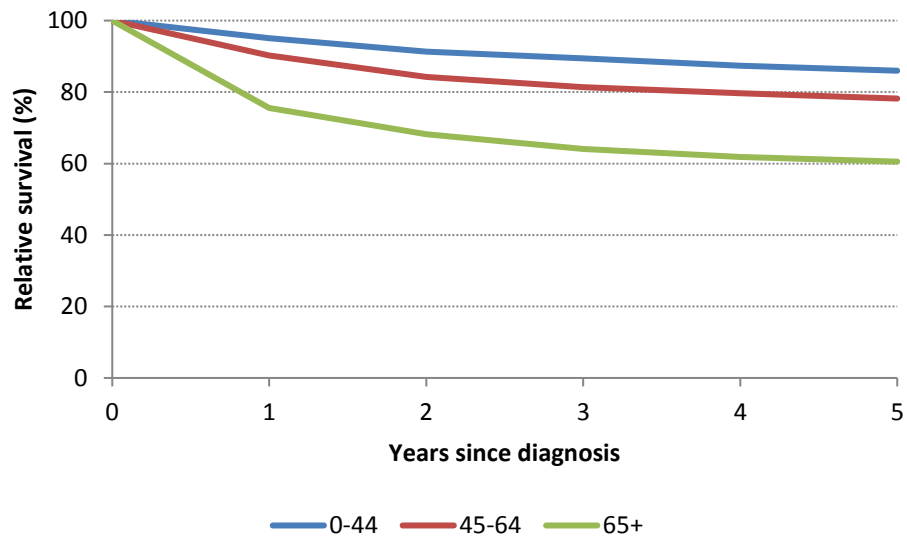
Source: ACT Cancer Registry

Figure 6: Survival by sex, all cancers combined, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 7: Survival by age group, all cancers combined, persons, ACT, 2003–2012



Source: ACT Cancer Registry

b. Bladder cancer (C67)

Five-year relative survival for bladder cancer has not changed significantly between 1983–1992 (57%) and 2003–2012 (59%) (Table 12 and Figure 8).

People with bladder cancer under the age of 65 had better survival (72%) than those aged 65 and over (53%) (Table 11 and Figure 10). This finding was statistically significant.

There was no significant difference in survival between males and females (Table 11 and Figure 9).

Clinical interpretation: Bladder cancer remains difficult to control, particularly in older persons, with no change in relative survival over time. Surgery for bladder cancer is complex. In older persons affected by bladder cancer comorbid medical conditions can make surgical treatment impracticable due to the risk of complications.

Table 9: Summary of new cases, deaths and prevalence for bladder cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	461	304	63
Females	150	103	21
Persons	611	407	84

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 10: Relative survival by years after diagnosis for bladder cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	80.0	73.7–85.2
2	69.2	62.0–75.6
3	62.4	55.0–69.3
4	60.6	52.8–67.8
5	58.7	50.8–66.2

Source: ACT Cancer Registry

Table 11: 5-year relative survival for bladder cancer, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	62.0	52.7–70.7
Female	48.1	33.1–62.7
Age at diagnosis		
0–64	71.8	58.8–81.6
65+	53.3	43.4–63.0

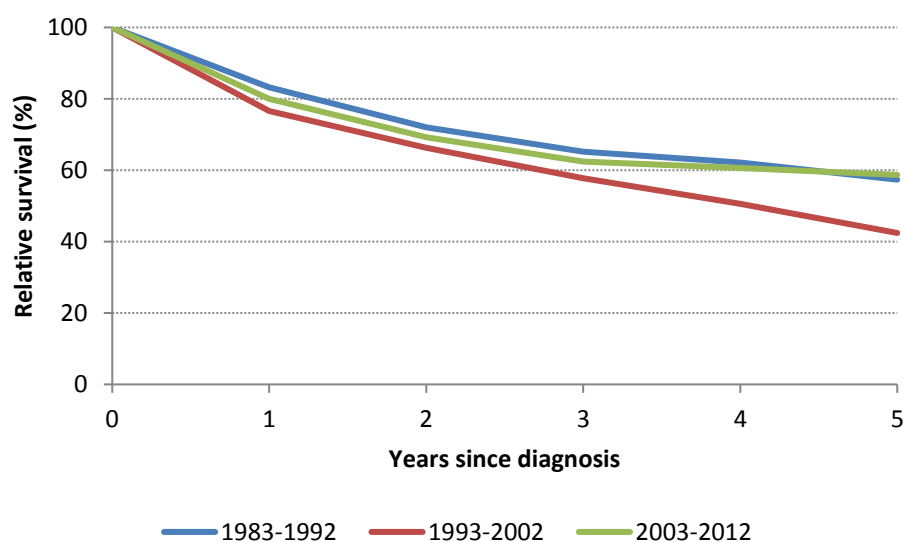
Source: ACT Cancer Registry

Table 12: 5-year relative survival for bladder cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	57.4	47.0–67.0
1993–2002	42.4	34.3–50.6
2003–2012	58.7	50.8–66.2

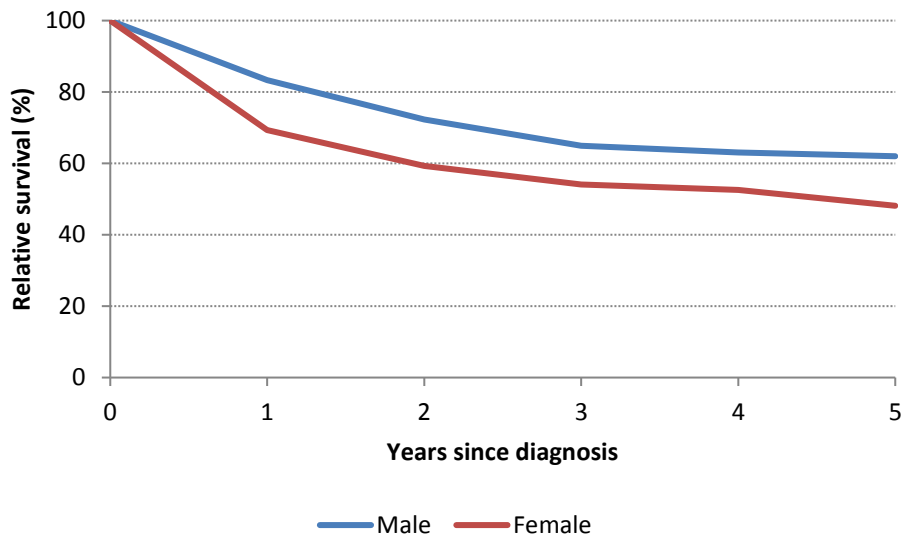
Source: ACT Cancer Registry

Figure 8: Survival by period, bladder cancer, persons, ACT, 1983–2012



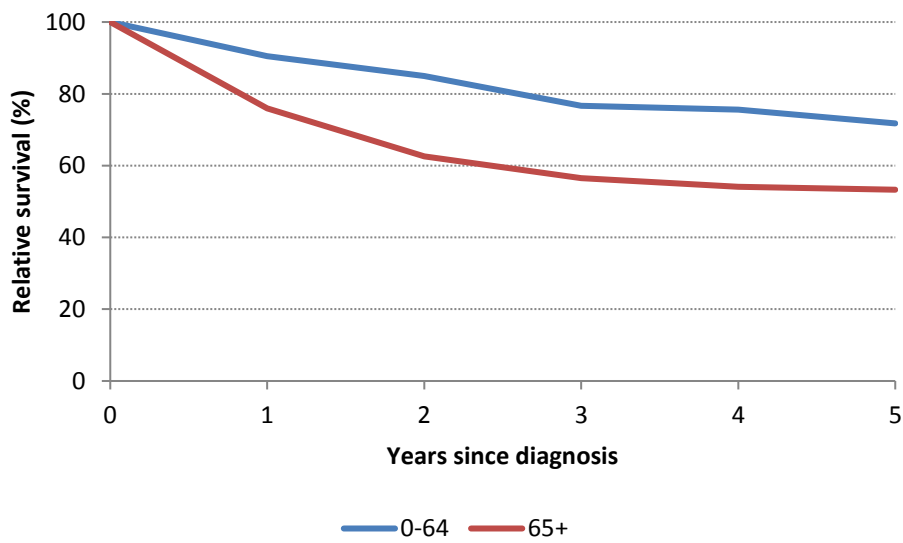
Source: ACT Cancer Registry

Figure 9: Survival by sex, bladder cancer, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 10: Survival by age group, bladder cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

c. Bowel cancer (C18–C20)

Five-year relative survival for bowel cancer has improved over time from 53% in the period 1983–1992 to 70% for the period 2003–2012 (Table 16 and Figure 11). This improvement was statistically significant.

People with bowel cancer under the age of 65 had better survival (76%) than those aged 65 and over (66%) (Table 15 and Figure 13). This finding was statistically significant.

There was no significant difference in survival between males and females (Table 15 and Figure 12).

Clinical interpretation: The survival outcome for bowel cancer has steadily improved due to enhanced treatment and possibly early diagnosis of symptomatic cases. The widespread use of adjuvant chemotherapy after surgery, commencing in the 1990s, almost certainly contributed to the improvement. The recently commenced population screening for bowel cancer will hopefully contribute to further improvement in the years to come.

Table 13: Summary of new cases, deaths and prevalence for bowel cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	2,204	1,216	394
Females	1,855	1,013	355
Persons	4,059	2,229	749

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 14: Relative survival by years after diagnosis for bowel cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	87.0	85.2–88.6
2	79.0	76.8–81.0
3	74.4	72.0–76.6
4	71.3	68.7–73.7
5	70.3	67.6–72.8

Source: ACT Cancer Registry

Table 15: 5-year relative survival for bowel cancer, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	68.4	64.8–71.9
Female	72.5	68.6–76.1
Age at diagnosis		
0–64	74.5	71.0–77.6
65+	67.2	63.3–71.0

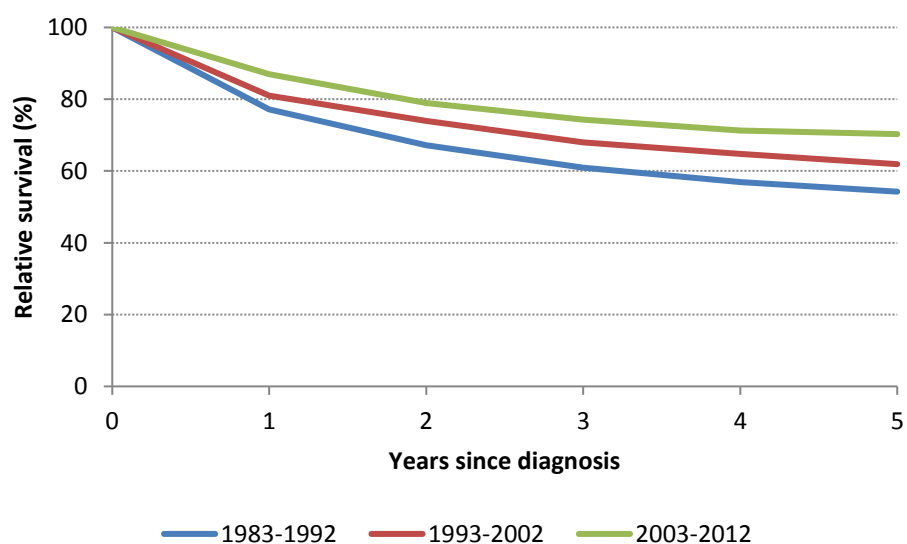
Source: ACT Cancer Registry

Table 16: 5-year relative survival for bowel cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	54.3	50.1–58.3
1993–2002	61.9	58.6–65.1
2003–2012	70.3	67.6–72.8

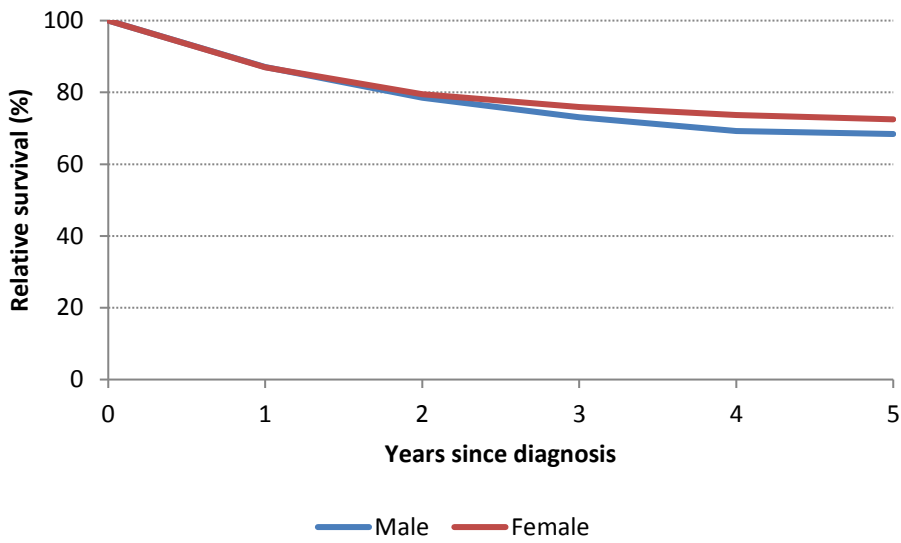
Source: ACT Cancer Registry

Figure 11: Survival by period, bowel cancer, persons, ACT, 1983–2012



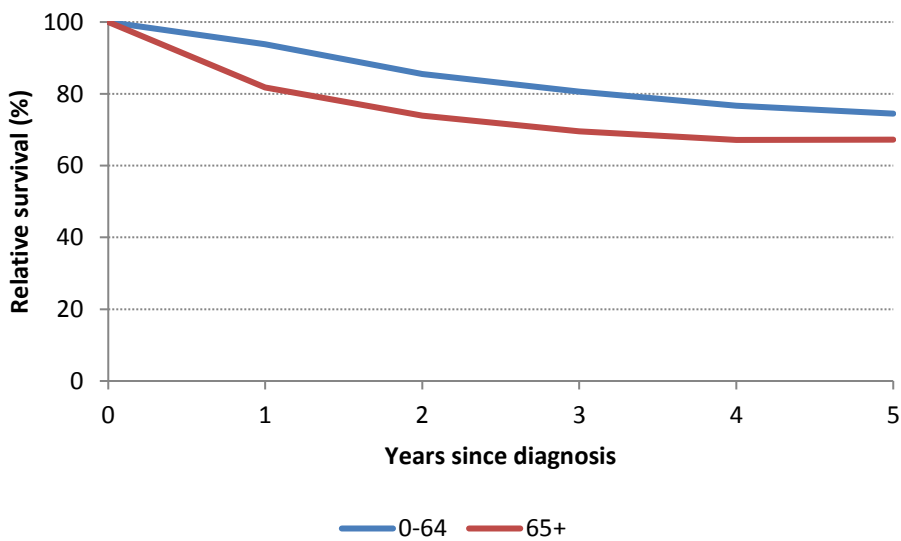
Source: ACT Cancer Registry

Figure 12: Survival by sex, bowel cancer, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 13: Survival by age group, bowel cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

d. Brain cancer (C71)

Survival estimates for brain cancer have been included in this report despite small numbers being diagnosed in ACT residents each year because it is a cancer for which survival is poor and has remained poor over time. As the number of cases per year is low, the number of cases varies from year to year resulting in wide confidence intervals for survival estimates. Therefore caution should be applied in interpreting trends.

Five-year relative survival for brain cancer has not changed significantly between 1983–1992 (27%) and 2003–2012 (26%) (Table 20 and Figure 14).

People with brain cancer under the age of 65 had better survival (34%) than those aged 65 and over (3%) (Table 19 and Figure 16).

There was no significant difference in survival between males and females (Table 19 and Figure 15).

Clinical interpretation: Brain cancer remains one of the most serious cancers with little progress in improving relative survival over time. Survival is particularly poor in older persons and further research into treatment for this group is urgently required.

Table 17: Summary of new cases, deaths and prevalence for brain cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	299	236	28
Females	214	164	23
Persons	513	400	51

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 18: Relative survival by years after diagnosis for brain cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	52.3	45.3–58.9
2	35.6	28.9–42.3
3	30.2	23.9–36.8
4	27.7	21.5–34.1
5	25.5	19.6–31.9

Source: ACT Cancer Registry

Table 19: 5-year relative survival for brain cancer, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	22.6	15.1–31.1
Female	28.7	19.7–38.4
Age at diagnosis		
0–64	34.0	26.2–42.0
65+	2.9	0.1–15.4

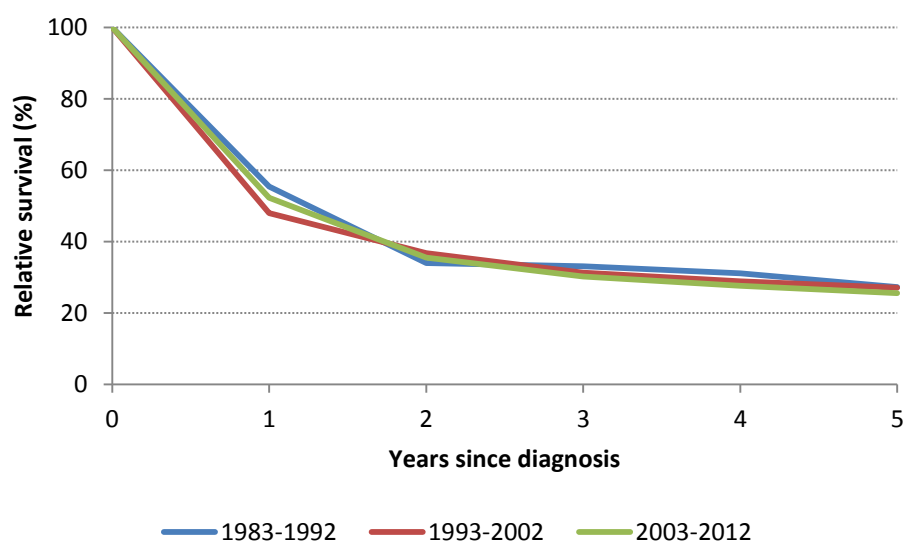
Source: ACT Cancer Registry

Table 20: 5-year relative survival for brain cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	27.3	19.0–36.3
1993–2002	27.1	20.5–34.2
2003–2012	25.5	19.6–31.9

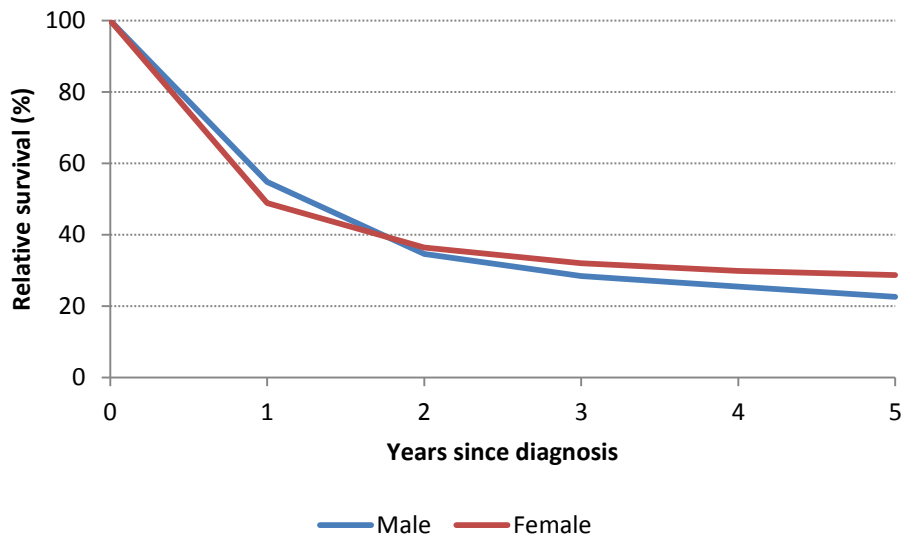
Source: ACT Cancer Registry

Figure 14: Survival by period, brain cancer, persons, ACT, 1983–2012



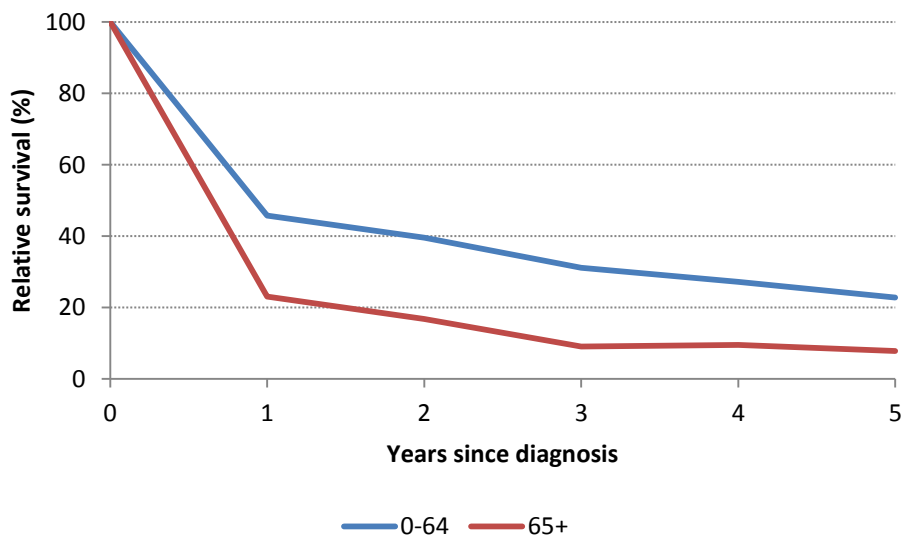
Source: ACT Cancer Registry

Figure 15: Survival by sex, brain cancer, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 16: Survival by age group, brain cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

e. Breast cancer (female) (C50)

Five-year relative survival for breast cancer has improved over time from 78% in the period 1983–1992 to 91% for the period 2003–2012 (Table 24 and Figure 17). This improvement was statistically significant.

Of women in the ACT diagnosed with breast cancer aged 0-44 years, 89% survived for five years, compared with 93% of women diagnosed in the 45 to 64 age group and 90% in the 65 and over age group (2003-2012) (Table 23 and Figure 18). These differences are not statistically significant.

Clinical interpretation: The very welcome improvement in breast cancer relative survival reflects early diagnosis through screening mammography and improved treatment for early stage breast cancer. The widespread adoption of adjuvant endocrine therapy, most notably with tamoxifen, has likely been the most important treatment factor. In recent years the more widespread use of adjuvant chemotherapy and the introduction of trastuzumab would have contributed.

Table 21: Summary of new cases, deaths and prevalence for breast cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Females	4,639	1,392	1142

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 22: Relative survival by years after diagnosis for breast cancer, females, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	98.2	97.4–98.8
2	96.5	95.4–97.4
3	94.6	93.3–95.7
4	92.8	91.3–94.1
5	91.5	89.8–92.9

Source: ACT Cancer Registry

Table 23: 5-year relative survival for female breast cancer, by age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Female	91.5	89.8–92.9
Age at diagnosis		
0–44	89.0	84.8–92.1
45–64	92.9	91.1–94.4
65+	90.1	85.9–93.9

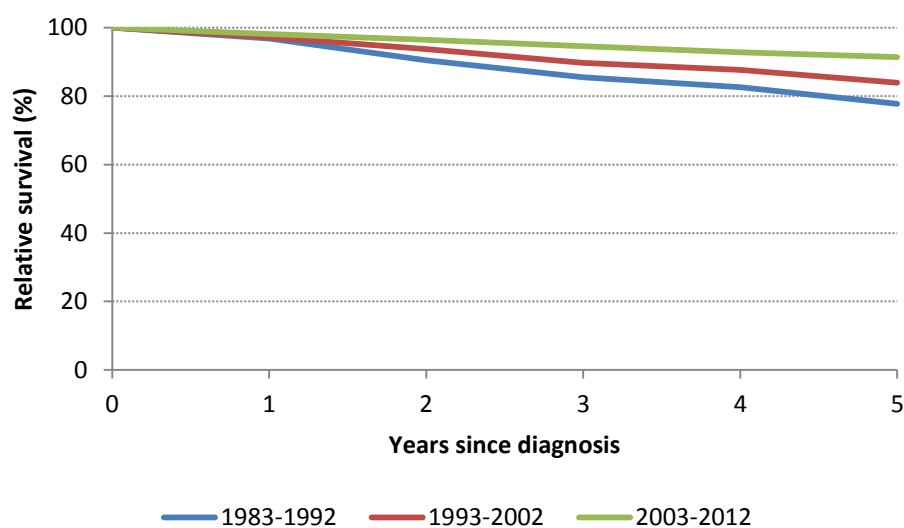
Source: ACT Cancer Registry

Table 24: 5-year relative survival for breast cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	77.8	73.9–81.3
1993–2002	84.0	81.5–86.2
2003–2012	91.5	89.8–92.9

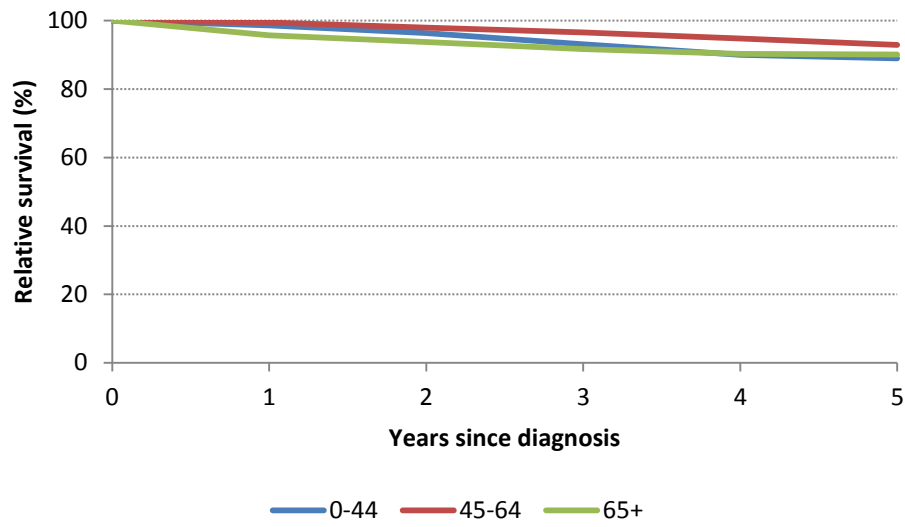
Source: ACT Cancer Registry

Figure 17: Survival by period, breast cancer, persons, ACT, 1983–2012



Source: ACT Cancer Registry

Figure 18: Survival by age group, breast cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

f. Head and neck cancers (C01–C14, C30–C32)

Survival estimates for head and neck cancers have been included in this report despite small numbers being diagnosed in ACT residents each year because they are cancers for which survival is poor and has remained poor over time. As the number of cases per year is low, the number of cases varies from year to year resulting in wide confidence intervals for survival estimates. Therefore caution should be applied in interpreting trends.

Five-year relative survival for head and neck cancers has not changed significantly between 1983–1992 (62%) and 2003–2012 (60%) (Table 28 and Figure 19).

People with head and neck cancers under the age of 65 had better survival (70%) than those aged 65 and over (41%) (Table 27 and Figure 21). This finding was statistically significant.

There was no significant difference in survival between males and females (Table 27 and Figure 20).

Clinical interpretation: The treatment of head and neck cancer includes complex surgery and radiation therapy. Although there has been steady improvement and refinement of these treatments, relative survival has not improved. The treatments based around combination of chemotherapy and radiotherapy are too recent to be apparent in these results. Treatment for head and neck cancer is very often complex and not always safe or feasible for older persons, contributing to the poor relative survival in the group aged over 65 years.

Table 25: Summary of new cases, deaths and prevalence for head and neck cancers, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	544	321	87
Females	220	121	40
Persons	764	442	127

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 26: Relative survival by years after diagnosis for head and neck cancers, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	86.8	82.1–90.4
2	72.5	66.6–77.6
3	67.2	61.0–72.8
4	62.7	56.3–68.5
5	60.1	53.6–66.2

Source: ACT Cancer Registry

Table 27: 5-year relative survival for head and neck cancers, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	61.0	52.9–68.5
Female	58.0	46.6–68.0
Age at diagnosis		
0–64	70.3	62.6–76.7
65+	41.2	30.4–52.2

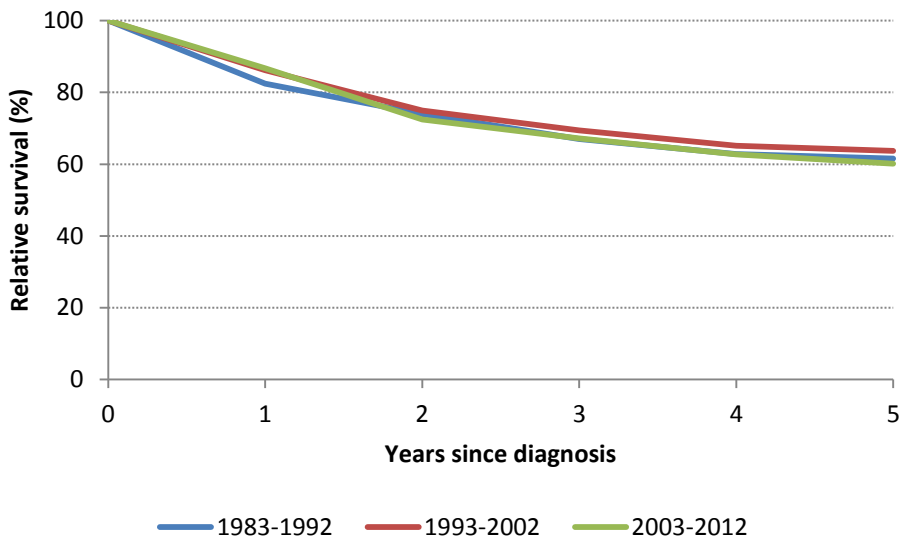
Source: ACT Cancer Registry

Table 28: 5-year relative survival for head and neck cancers, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	61.6	52.7–69.5
1993–2002	63.7	56.8–70.0
2003–2012	60.1	53.6–66.2

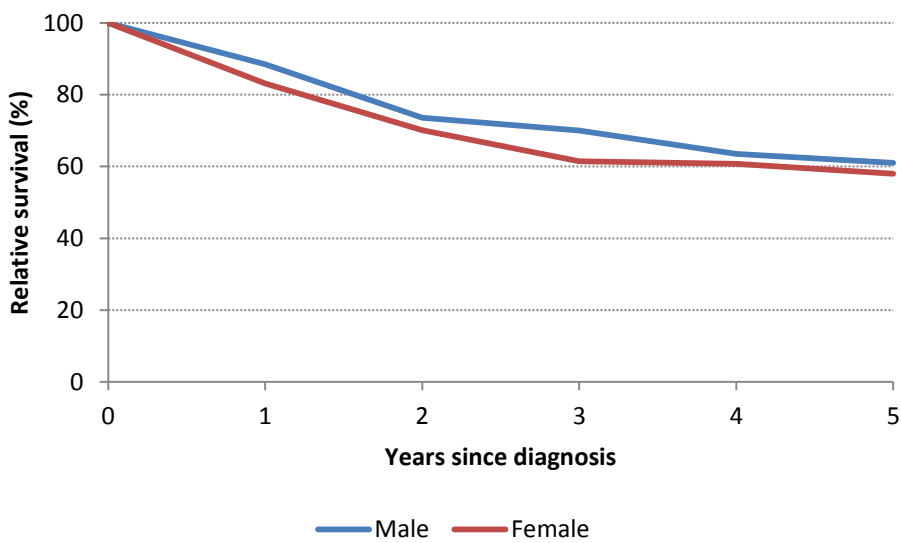
Source: ACT Cancer Registry

Figure 19: Survival by period, head and neck cancers, persons, ACT, 1983–2012



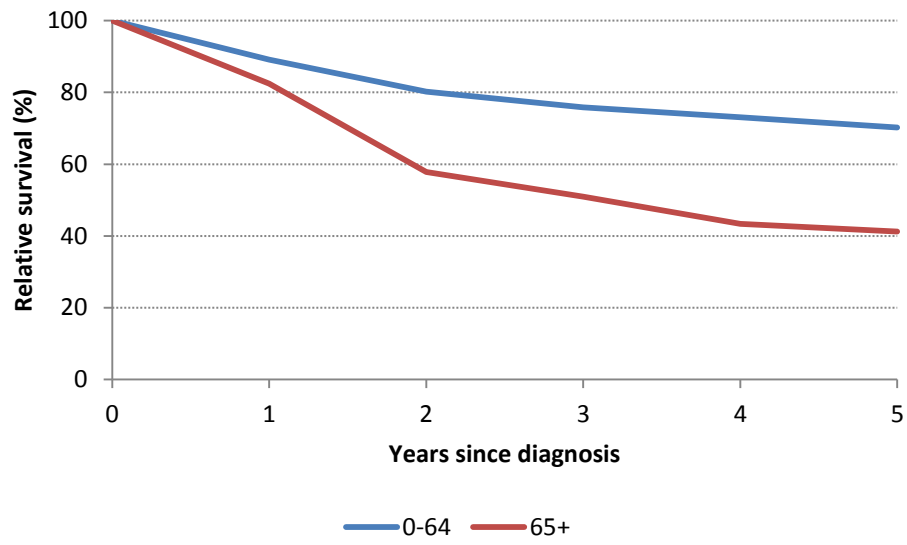
Source: ACT Cancer Registry

Figure 20: Survival by sex, head and neck cancers, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 21: Survival by age group, head and neck cancers, persons, ACT, 2003–2012



Source: ACT Cancer Registry

g. Kidney cancer (C64–C66, C68)

Five-year relative survival for kidney cancer has improved over time from 53% in the period 1983–1992 to 70% for the period 2003–2012 (Table 32 and Figure 22). This improvement was statistically significant.

People with kidney cancer under the age of 65 had better survival (76%) than those aged 65 and over (66%) (Table 31 and Figure 24). This finding was statistically significant.

There was no significant difference in survival between males and females (Table 31 and Figure 23).

Clinical interpretation: The five year relative survival from kidney cancer improved in the most recent 10-year period, most likely reflecting better surgical outcomes and earlier diagnosis through the use of Computerised Tomography (CT) scanning. New effective treatments for advanced kidney cancer have recently become available and may influence survival outcomes in future.

Table 29: Summary of new cases, deaths and prevalence for kidney cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	539	271	118
Females	303	154	61
Persons	842	425	179

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 30: Relative survival by years after diagnosis for kidney cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	83.4	79.1–87.0
2	78.1	73.3–82.3
3	73.4	68.2–78.0
4	72.5	67.1–77.4
5	69.9	64.2–75.0

Source: ACT Cancer Registry

Table 31: 5-year relative survival for kidney cancer, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	69.3	62.1–75.9
Female	70.5	61.1–78.5
Age at diagnosis		
0–64	78.8	72.0–84.3
65+	60.2	51.1–68.8

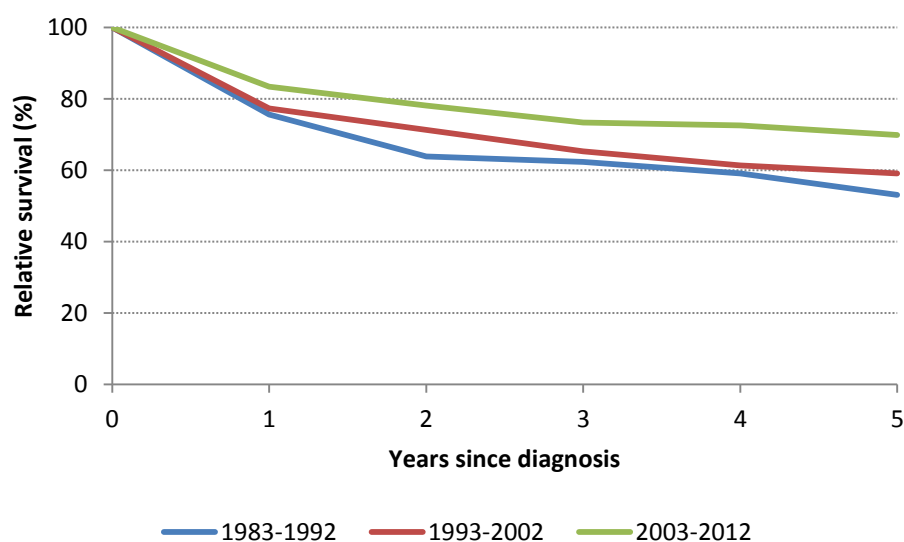
Source: ACT Cancer Registry

Table 32: 5-year relative survival for kidney cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	53.1	42.6–62.9
1993–2002	59.1	51.6–66.1
2003–2012	69.9	64.2–75.0

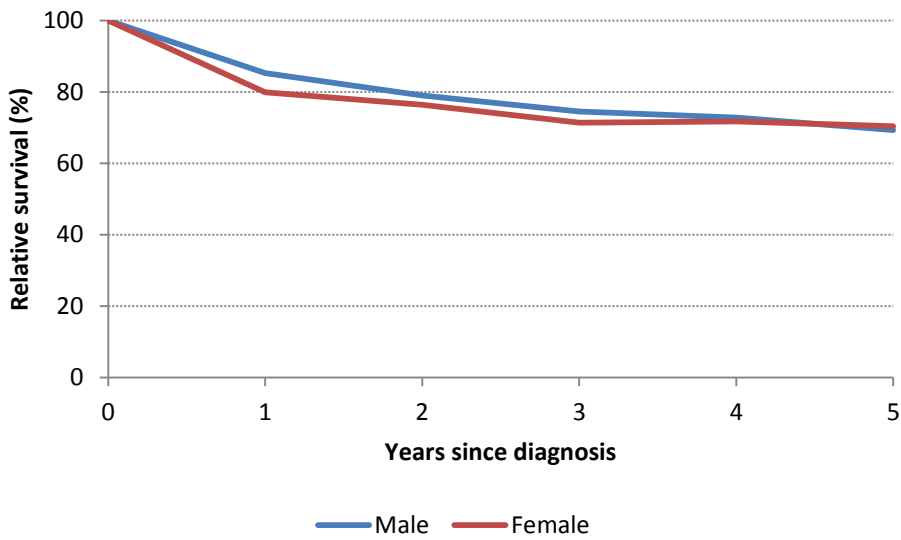
Source: ACT Cancer Registry

Figure 22: Survival by period, kidney cancer, persons, ACT, 1983–2012



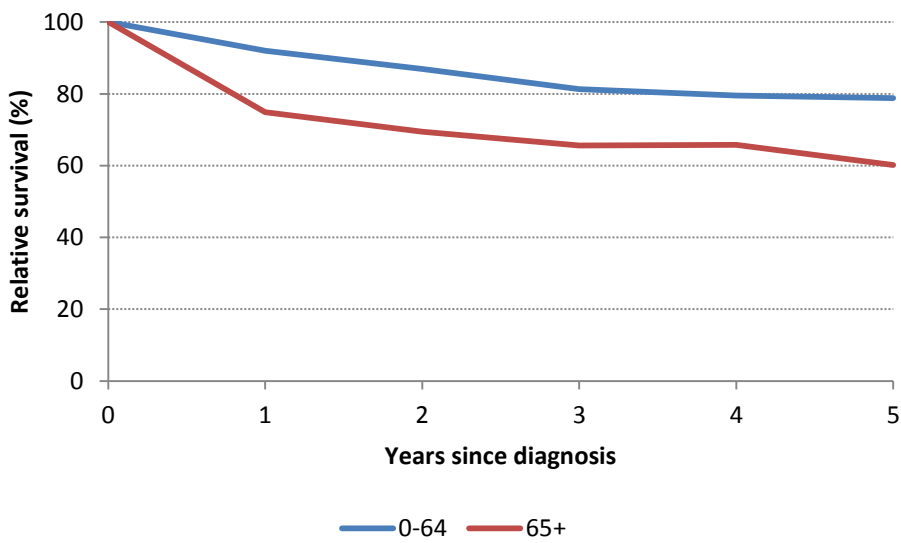
Source: ACT Cancer Registry

Figure 23: Survival by sex, kidney cancer, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 24: Survival by age group, kidney cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

h. Leukaemias (C91–C95)

Five-year relative survival for leukaemia has improved over time from 49% in the period 1983–1992 to 66% for the period 2003–2012 (Table 36 and Figure 25). This improvement was statistically significant.

People with leukaemia under the age of 65 had better survival (78%) than those aged 65 and over (54%) (Table 35 and Figure 27). This finding was statistically significant.

There was no significant difference in survival between males and females (Table 35 and Figure 26).

Clinical interpretation: The term leukaemia includes a diverse group of disease ranging from low-grade chronic forms of leukaemia to highly aggressive acute leukaemia. There has been steady improvement in treatment across the range of these conditions which may be reflected in the improved relative survival. Earlier diagnosis of some of the chronic forms through blood tests could also have contributed through lead time bias. Age is a well-known prognostic factor in acute leukaemia and specific research into the treatment of older persons is being conducted internationally.

Table 33: Summary of new cases, deaths and prevalence for all leukaemias, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	599	343	100
Females	394	215	84
Persons	993	558	184

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 34: Relative survival by years after diagnosis for all leukaemias, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	82.1	77.9–85.7
2	74.8	70.0–79.0
3	70.6	65.6–75.2
4	67.5	62.3–72.4
5	66.3	60.8–71.3

Source: ACT Cancer Registry

Table 35: 5-year relative survival for all leukaemias, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	63.9	56.9–70.4
Female	70.0	61.2–77.7
Age at diagnosis		
0–64	78.0	71.5–83.3
65+	53.6	45.1–61.8

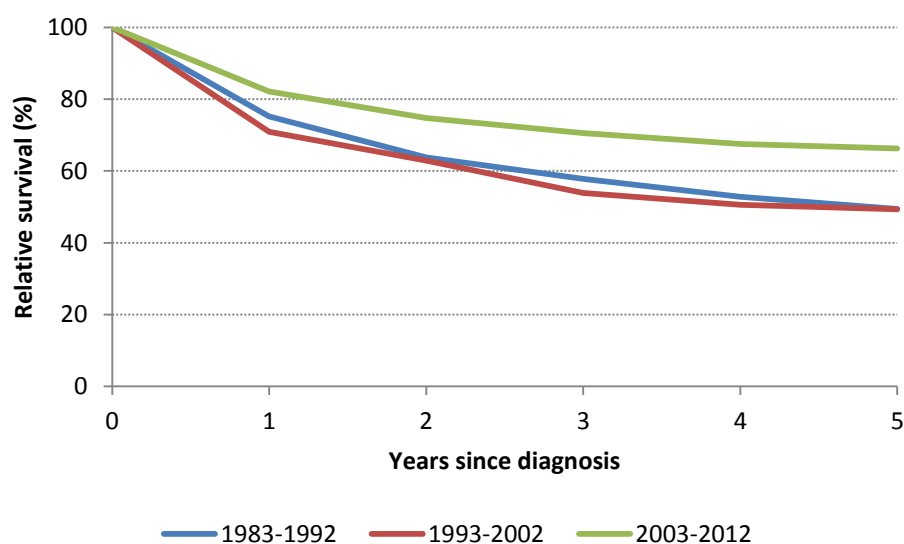
Source: ACT Cancer Registry

Table 36: 5-year relative survival for all leukaemias, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	49.4	41.0–57.5
1993–2002	49.4	43.0–55.5
2003–2012	66.3	60.8–71.3

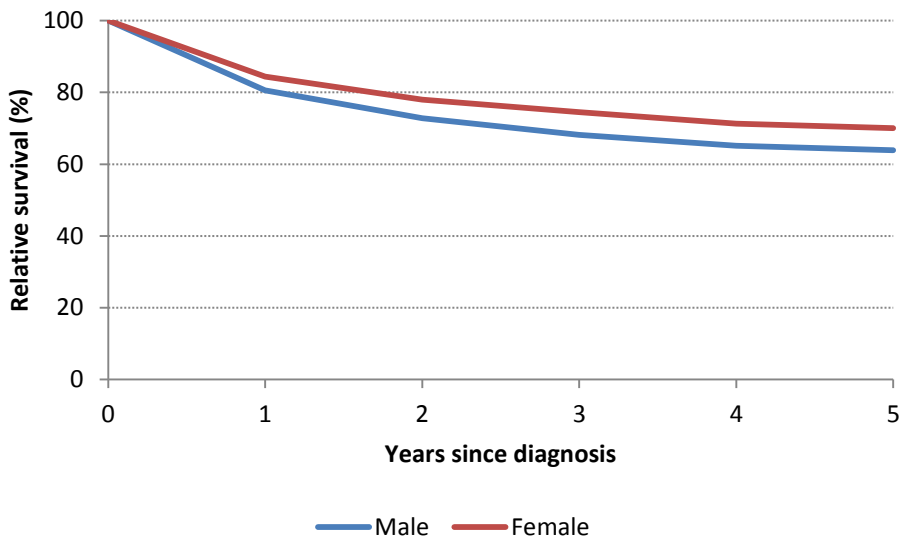
Source: ACT Cancer Registry

Figure 25: Survival by period, all leukaemias, persons, ACT, 1983–2012



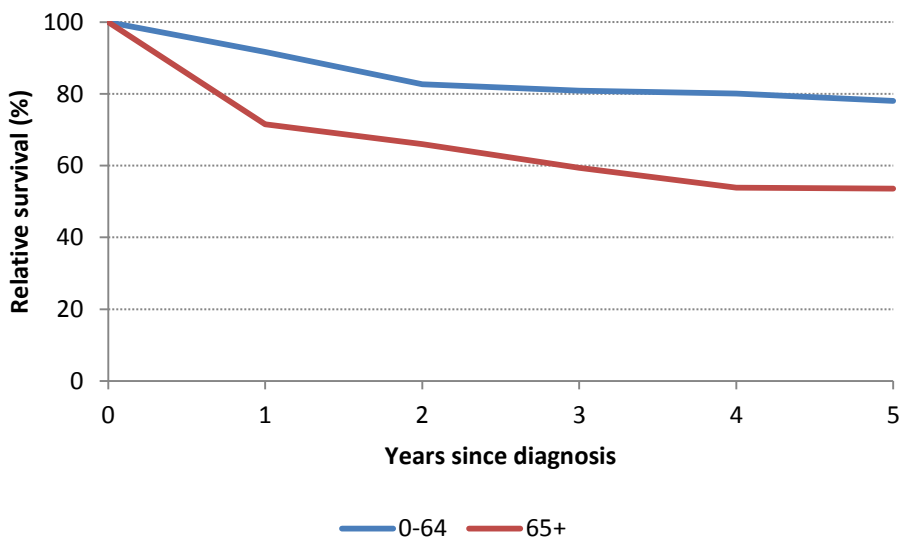
Source: ACT Cancer Registry

Figure 26: Survival by sex, all leukaemias, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 27: Survival by age group, all leukaemias, persons, ACT, 2003–2012



Source: ACT Cancer Registry

i. Liver (C22)

Survival estimates for liver cancer have been included in this report despite small numbers being diagnosed in ACT residents each year because it is a cancer for which survival is poor and has remained poor over time. As the number of cases per year is low, the number of cases varies from year to year resulting in wide confidence intervals for survival estimates. Therefore caution should be applied in interpreting trends.

Five-year relative survival for liver cancer has not changed significantly over time (Table 40 and Figure 28).

People with liver cancer under the age of 65 had better survival (23%) than those aged 65 and over (8%) (Table 39 and Figure 30). This finding was statistically significant.

There was no significant difference in survival between males and females (Table 39 and Figure 29).

Clinical interpretation: Treatment of primary liver cancer remains difficult with only a minority of persons affected being able to undergo complex curative surgery (due to the position of the tumours, extent of disease, and other factors).

Table 37: Summary of new cases, deaths and prevalence for liver cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	184	150	25
Females	86	72	5
Persons	270	222	30

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 38: Relative survival by years after diagnosis for liver cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	34.2	26.7–41.9
2	27.7	20.7–35.2
3	19.4	13.3–26.5
4	17.6	11.6–24.7
5	14.7	9.0–21.7

Source: ACT Cancer Registry

Table 39: 5-year relative survival for liver cancer, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	13.8	7.2–22.8
Female	15.6	6.7–27.8
Age at diagnosis		
0–64	22.8	12.9–34.4
65+	7.8	2.9–16.2

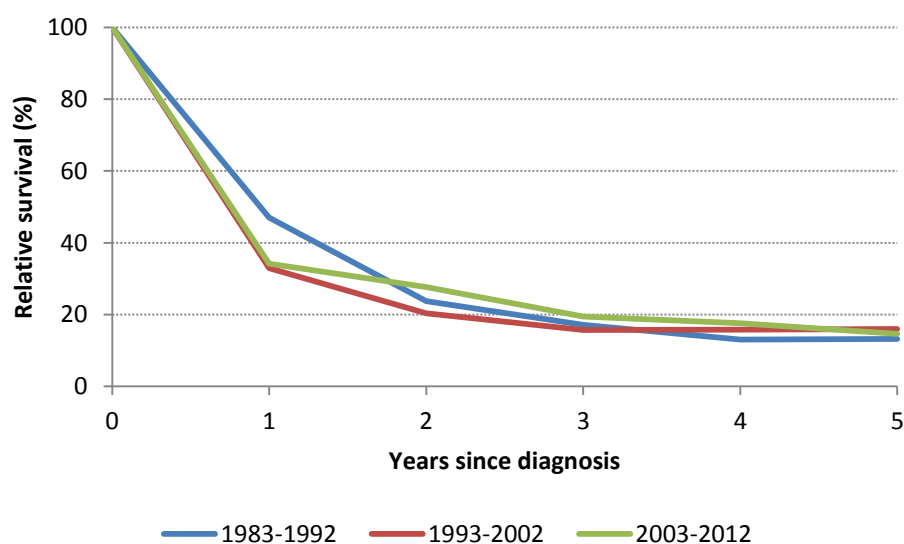
Source: ACT Cancer Registry

Table 40: 5-year relative survival for liver cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	13.2	3.8–28.8
1993–2002	16.0	8.4–25.8
2003–2012	14.7	9.0–21.7

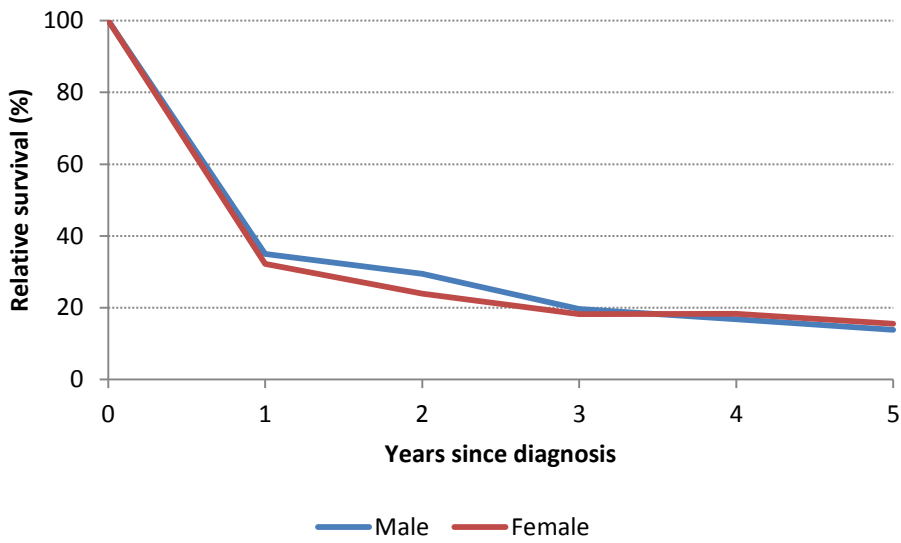
Source: ACT Cancer Registry

Figure 28: Survival by period, liver cancer, persons, ACT, 1983–2012



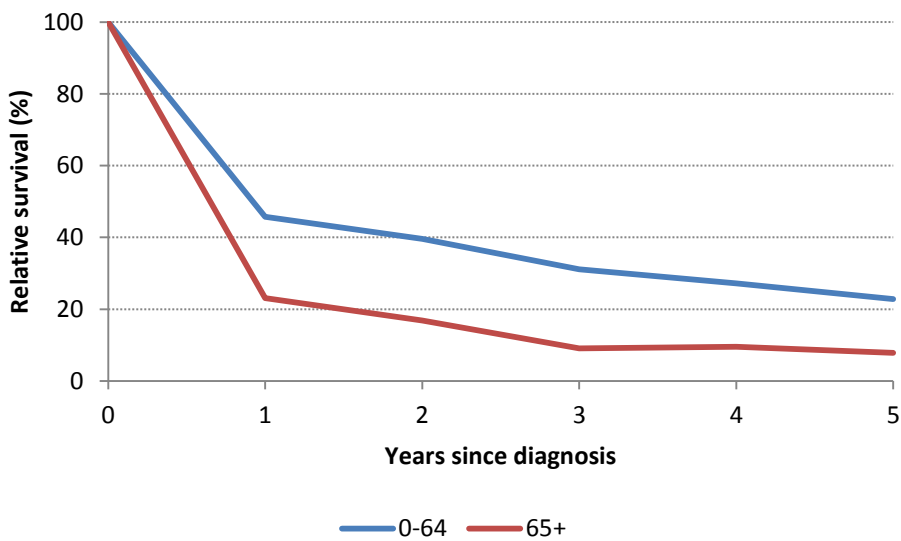
Source: ACT Cancer Registry

Figure 29: Survival by sex, liver cancer, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 30: Survival by age group, liver cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

j. Lung Cancer (C33, C34)

Five-year relative survival for lung cancer has improved over time from 12% in the period 1983–1992 to 19% for the period 2003–2012 (Table 44 and Figure 31). This improvement was statistically significant. Despite the improvement, survival for lung cancer is still low.

People with lung cancer under the age of 65 had better survival (24%) than those aged 65 and over (16%) (Table 43 and Figure 33). This finding was statistically significant.

There was no significant difference in survival between males and females (Table 43 and Figure 32).

Clinical interpretation: Lung cancer remains a major cause of cancer mortality. Treatment remains difficult with only modest improvement in relative survival over time. Recently, outcomes of treatments for advanced lung cancer have shown significant progress, and this improvement may be reflected in survival in future studies.

Table 41: Summary of new cases, deaths and prevalence for lung cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	1,334	1,189	75
Females	889	739	88
Persons	2,223	1,928	163

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 42: Relative survival by years after diagnosis for lung cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	44.3	41.1–47.5
2	30.4	27.4–33.4
3	24.0	21.2–27.0
4	20.6	17.9–23.5
5	19.2	16.6–22.1

Source: ACT Cancer Registry

Table 43: 5-year relative survival for lung cancer, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	17.1	13.7–20.8
Female	21.8	17.6–26.3
Age at diagnosis		
0–64	24.4	19.6–29.5
65+	16.4	13.3–19.8

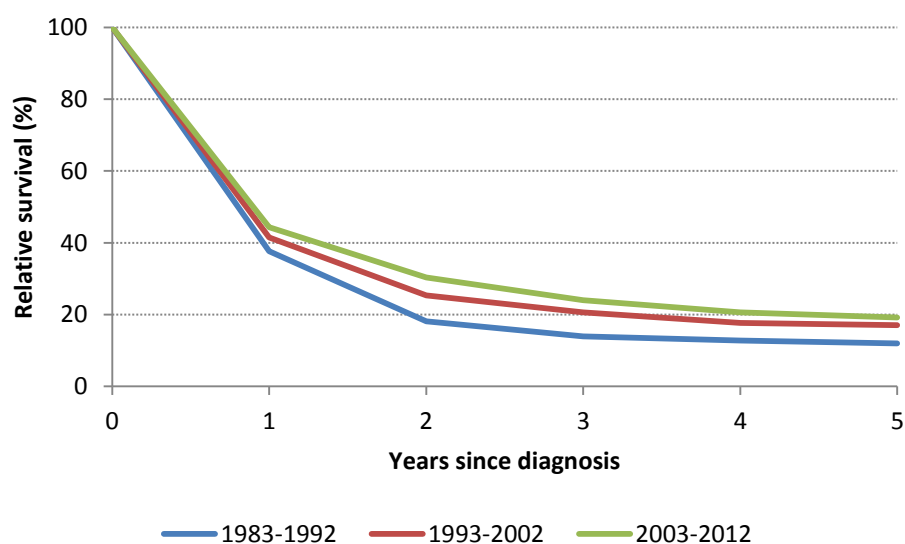
Source: ACT Cancer Registry

Table 44: 5-year relative survival for lung cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	12.0	9.1–15.4
1993–2002	17.1	14.1–20.3
2003–2012	19.2	16.6–22.1

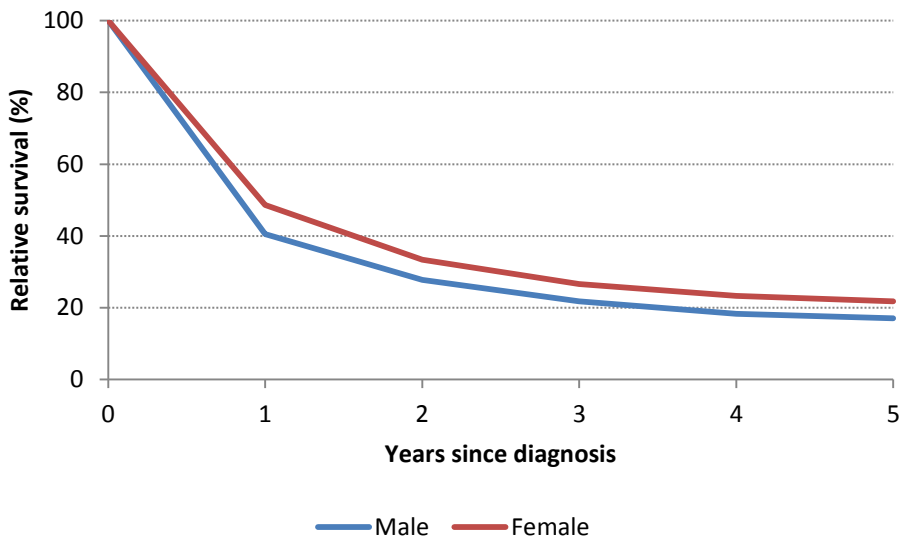
Source: ACT Cancer Registry

Figure 31: Survival by period, lung cancer, persons, ACT, 1983–2012



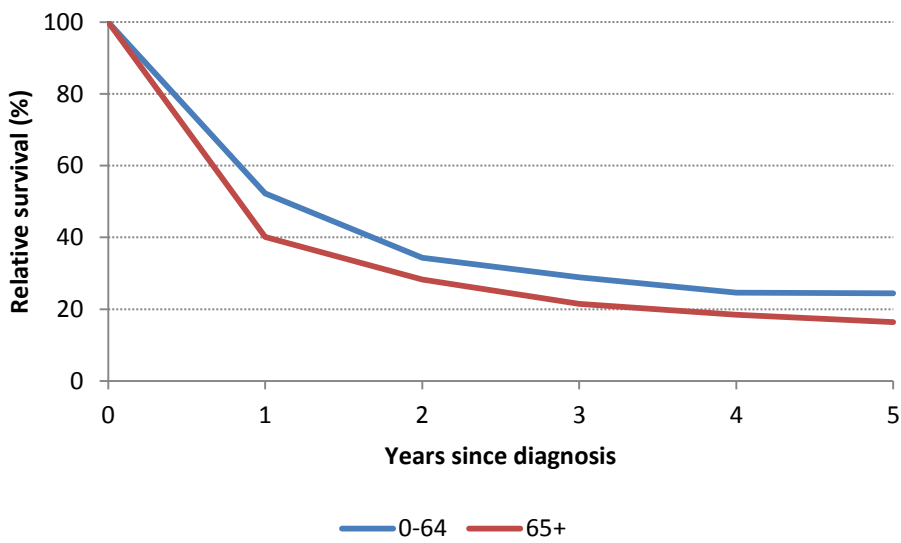
Source: ACT Cancer Registry

Figure 32: Survival by sex, lung cancer, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 33: Survival by age group, lung cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

k. Melanoma of skin (C43)

Five-year relative survival for melanoma is high and has not changed significantly over time (89% in the period 1983–1992 and 91% for the period 2003–2012) (Table 48 and Figure 34).

People with melanoma aged 45–64 years had better survival (94%) than those aged 65 and over (84%) (Table 47 and Figure 36). This finding was statistically significant. There was no significant difference in survival between those aged 0–44 years and those aged 45–64.

Females had better survival (93%) than males (89%). This finding was statistically significant (Table 47 and Figure 35).

Clinical interpretation: Melanoma has a high incidence and prevalence. Despite the good relative survival of 90.8% at five years, the disease remains a significant health problem for our community. The treatment of advanced stage melanoma has recently improved dramatically and may further improve relative survival rates in years to come.

Table 45: Summary of new cases, deaths and prevalence for melanoma, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	1,679	518	343
Females	1,360	280	239
Persons	3,039	798	582

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 46: Relative survival by years after diagnosis for melanoma, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	97.1	95.8–98.2
2	94.6	92.9–96.1
3	93.2	91.2–94.9
4	91.7	89.5–93.6
5	90.8	88.4–92.9

Source: ACT Cancer Registry

Table 47: 5-year relative survival for melanoma, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	88.6	85.1–91.7
Female	93.4	90.2–96.0
Age at diagnosis		
0–44	95.2	91.8–97.2
45–64	93.6	90.8–95.7
65+	84.2	78.5–89.4

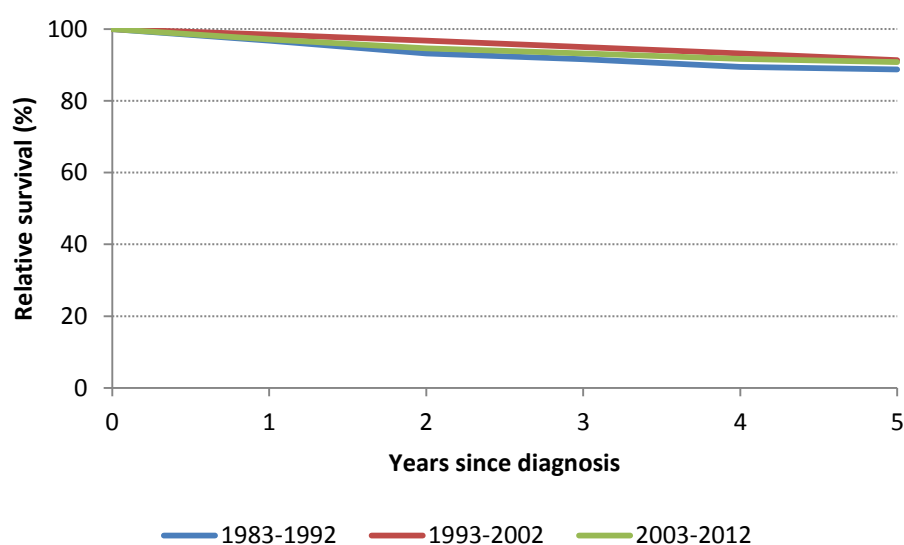
Source: ACT Cancer Registry

Table 48: 5-year relative survival for melanoma, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	88.7	85.5–91.4
1993–2002	91.3	88.8–93.6
2003–2012	90.8	88.4–92.9

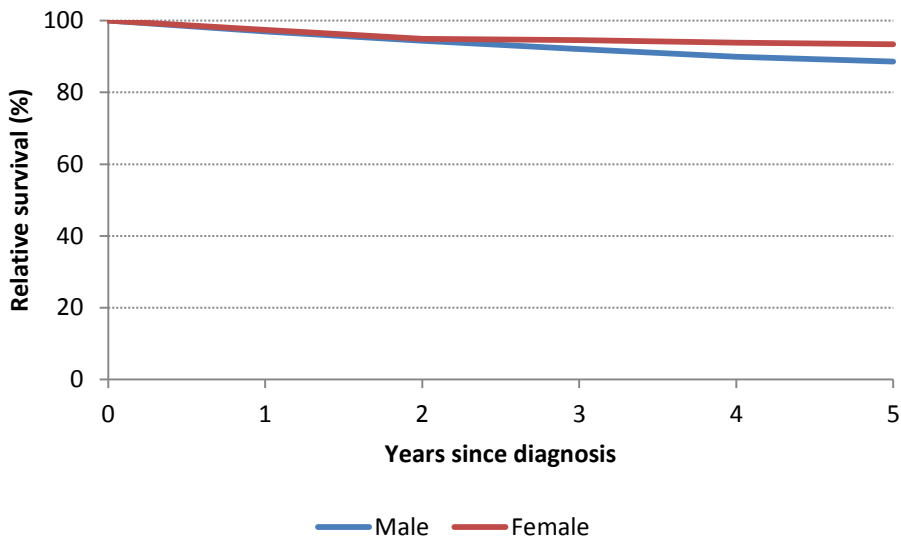
Source: ACT Cancer Registry

Figure 34: Survival by period, melanoma, persons, ACT, 1983–2012



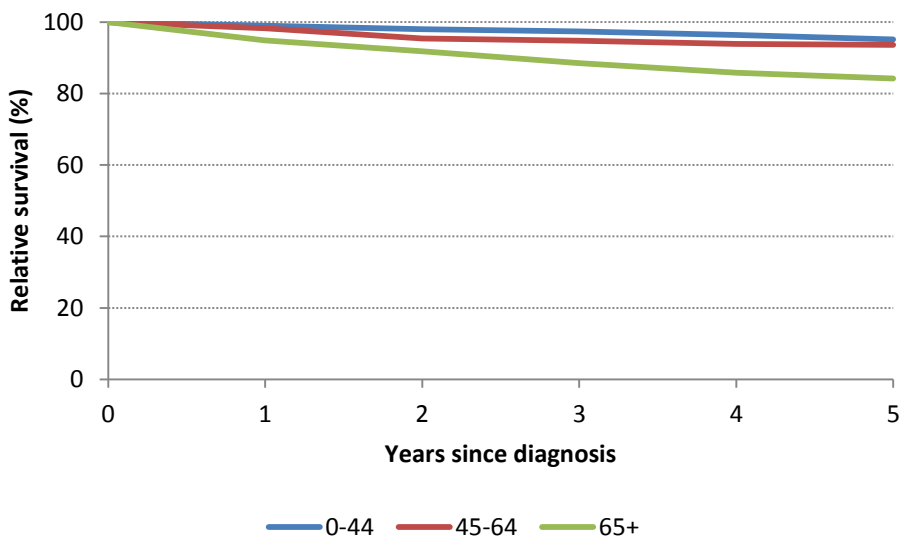
Source: ACT Cancer Registry

Figure 35: Survival by sex, melanoma, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 36: Survival by age group, melanoma, persons, ACT, 2003–2012



Source: ACT Cancer Registry

I. Ovarian cancer (C56, C57.0–C57.7)

Survival estimates for ovarian cancer have been included because they are important in that survival for ovarian cancer is low. As the number of cases per year is low, the number varies from year to year resulting in wide confidence intervals for survival estimates. Therefore caution should be applied in interpreting trends.

Five-year relative survival for ovarian cancer has improved over time from 34% in the period 1983–1992 to 50% for the period 2003–2012 (Table 52 and Figure 37). This improvement was statistically significant.

People with ovarian cancer under the age of 65 had better survival (60%) than those aged 65 and over (37%) (Table 51 and Figure 38). This finding was statistically significant.

Clinical interpretation: Ovarian cancer remains a very serious illness with low cure rates. The important increase in relative survival seen over time reflects improved surgery and chemotherapy. Unfortunately, older women have substantially poorer outcomes. The complexity of the required surgery and chemotherapy imposes a greater risk of complications in older women with co-morbid medical conditions.

Table 49: Summary of new cases, deaths and prevalence for ovarian cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Females	461	293	66
Persons	461	293	66

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 50: Relative survival by years after diagnosis for ovarian cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	81.1	74.5–86.3
2	68.0	60.5–74.6
3	58.2	50.3–65.3
4	54.9	47.0–62.2
5	50.4	42.4–57.9

Source: ACT Cancer Registry

Table 51: 5-year relative survival for ovarian cancer, by age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Age at diagnosis		
0–64	60.4	50.0–69.3
65+	36.5	24.9–48.6

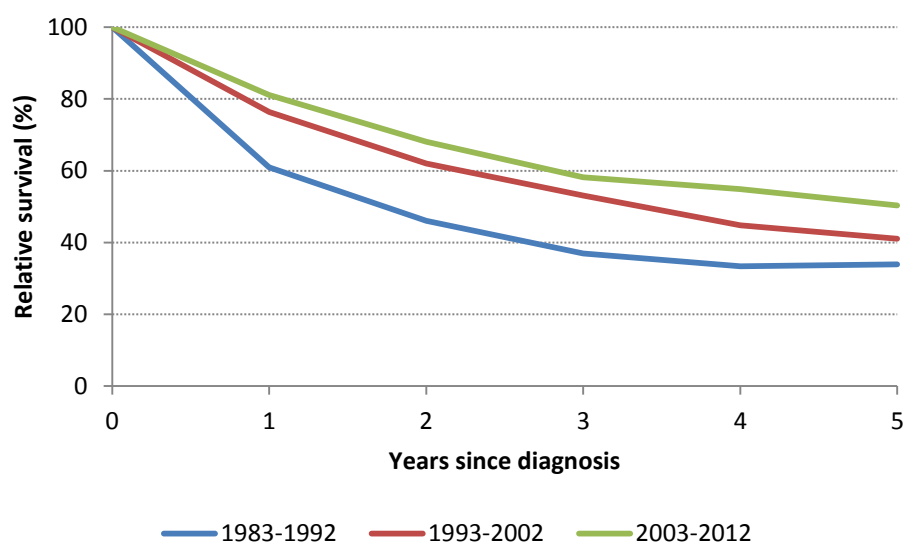
Source: ACT Cancer Registry

Table 52: 5-year relative survival for ovarian cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	33.9	24.3–43.9
1993–2002	41.1	32.6–49.4
2003–2012	50.4	42.4–57.9

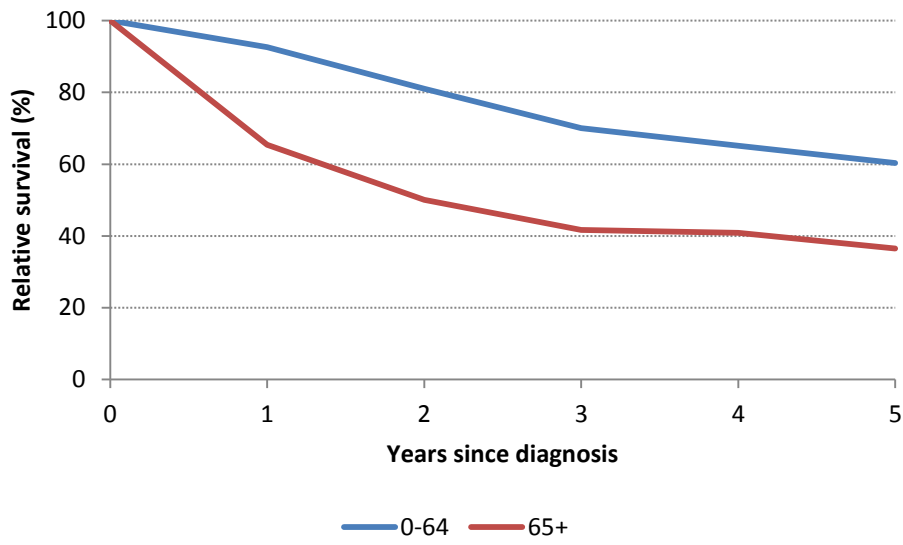
Source: ACT Cancer Registry

Figure 37: Survival by period, ovarian cancer, persons, ACT, 1983–2012



Source: ACT Cancer Registry

Figure 38: Survival by age group, ovarian cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

m. Pancreatic cancer (C25)

Five-year relative survival for pancreatic cancer is very low and has not changed significantly over time (10% in both periods 1983–1992 and 2003–2012 (Table 56 and Figure 39).

People with pancreatic cancer under the age of 65 had better survival (25%) than those aged 65 and over (4%) (Table 55 and Figure 41). This finding was statistically significant.

There was no significant difference in survival between males and females (Table 55 and Figure 40).

Clinical interpretation: The outcome for pancreatic cancer remains poor. Only a small proportion of people affected by pancreatic cancer are able to undergo potentially curative surgery. Most people do not undergo surgery because of advanced stage of the disease at the time of diagnosis. Surgery for pancreatic cancer is very complex and may not be feasible for an older person with significant other medical problems. Older persons affected by pancreatic cancer have a significantly worse survival outcome. The treatment of advanced pancreatic cancer is only slowly improving. Research is needed to improve outcomes in pancreatic cancer.

Table 53: Summary of new cases, deaths and prevalence for pancreatic cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	305	265	26
Females	276	246	23
Persons	581	511	49

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 54: Relative survival by years after diagnosis for pancreatic cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	28.5	23.4–33.8
2	16.1	11.8–21.0
3	11.7	7.9–16.3
4	9.4	5.9–13.9
5	9.6	6.0–14.2

Source: ACT Cancer Registry

Table 55: 5-year relative survival for pancreatic cancer, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	11.1	5.9–18.4
Female	8.5	4.1–14.8
Age at diagnosis		
0–64	25.4	15.0–37.2
65+	3.9	1.5–8.0

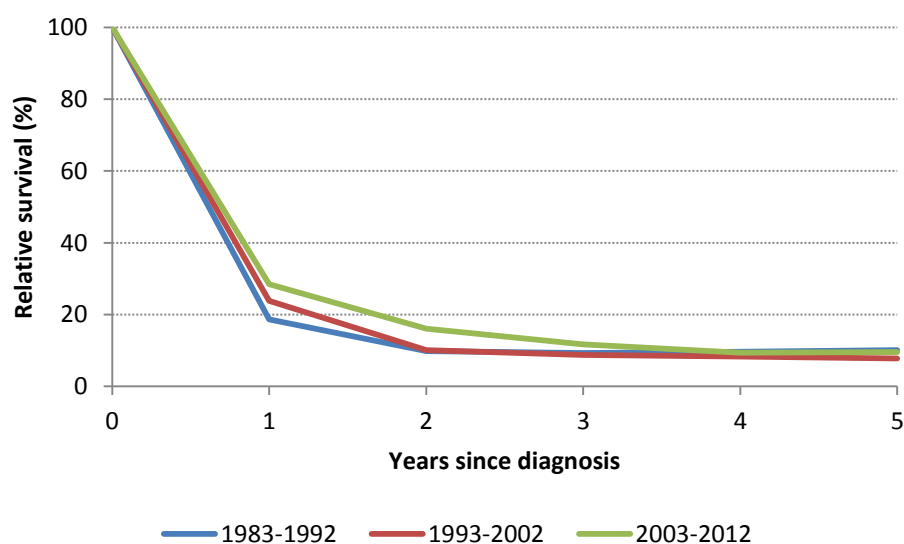
Source: ACT Cancer Registry

Table 56: 5-year relative survival for pancreatic cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	10.1	5.4–16.6
1993–2002	7.8	4.5–12.4
2003–2012	9.6	6.0–14.2

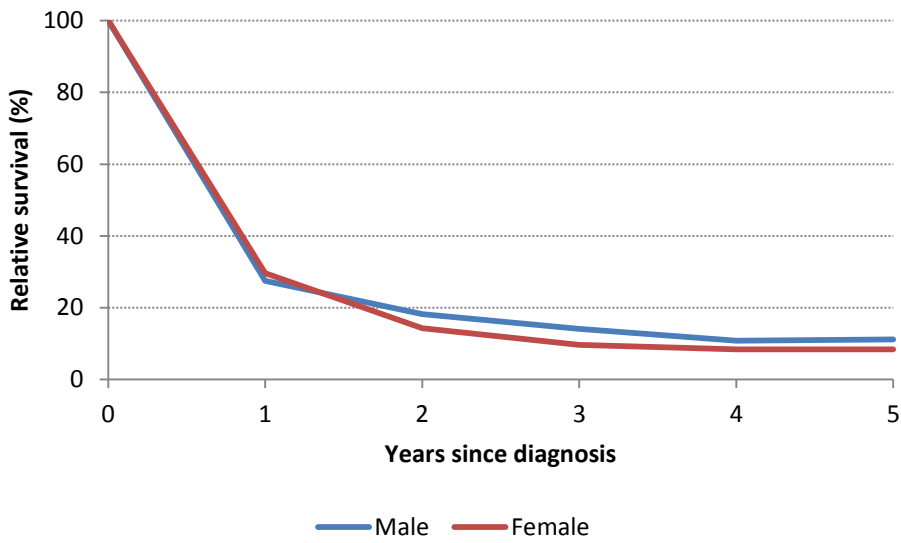
Source: ACT Cancer Registry

Figure 39: Survival by period, pancreatic cancer, persons, ACT, 1983–2012



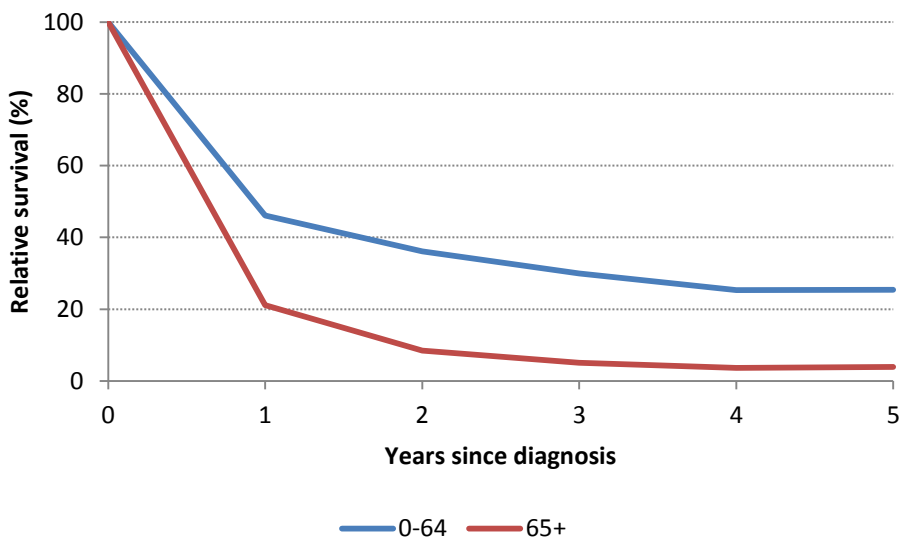
Source: ACT Cancer Registry

Figure 40: Survival by sex, pancreatic cancer, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 41: Survival by age group, pancreatic cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

n. Prostate cancer (C61)

Five-year relative survival for prostate cancer has improved over time from 54% in the period 1983–1992 to 95% for the period 2003–2012 (Table 60 and Figure 42). This improvement was statistically significant.

People with prostate cancer under the age of 65 had better survival (98%) than those aged 65 and over (93%) (Table 59 and Figure 43). This finding was statistically significant.

Clinical interpretation: The dramatic improvement in prostate cancer relative survival over time reflects earlier diagnosis and possibly the effect of better treatment. Lead time bias could explain some of the observed improvement. The very high five-year relative survival of 95% is reassuring. The finding that younger men had better relative survival than men over 65 years of age speaks against the view that prostate cancer is an indolent disease in the elderly.

Table 57: Summary of new cases, deaths and prevalence for prostate cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	4,392	1,597	1286
Females	N/A	N/A	N/A
Persons	4,392	1,597	1286

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 58: Relative survival by years after diagnosis for prostate cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	98.1	97.3–98.9
2	96.6	95.4–97.7
3	95.6	94.2–96.9
4	95.2	93.6–96.7
5	94.9	93.1–96.6

Source: ACT Cancer Registry

Table 59: 5-year relative survival for prostate cancer, by age-group, ACT, 2003–2012

Age at diagnosis	5-year survival (%)	95% confidence interval
0–64	97.8	96.1–99.1
65+	92.5	89.5–95.3

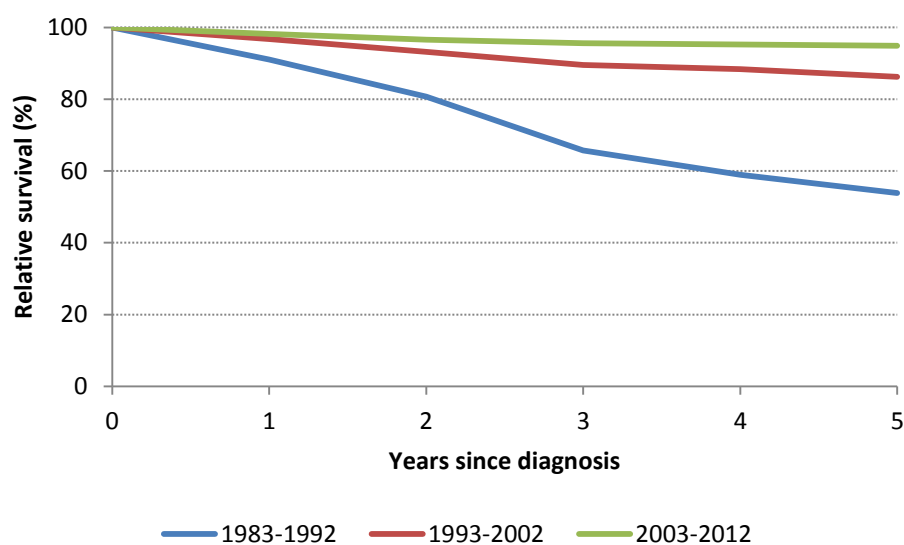
Source: ACT Cancer Registry

Table 60: 5-year relative survival for prostate cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	53.8	45.3–62.1
1993–2002	86.2	83.1–89.1
2003–2012	94.9	93.1–96.6

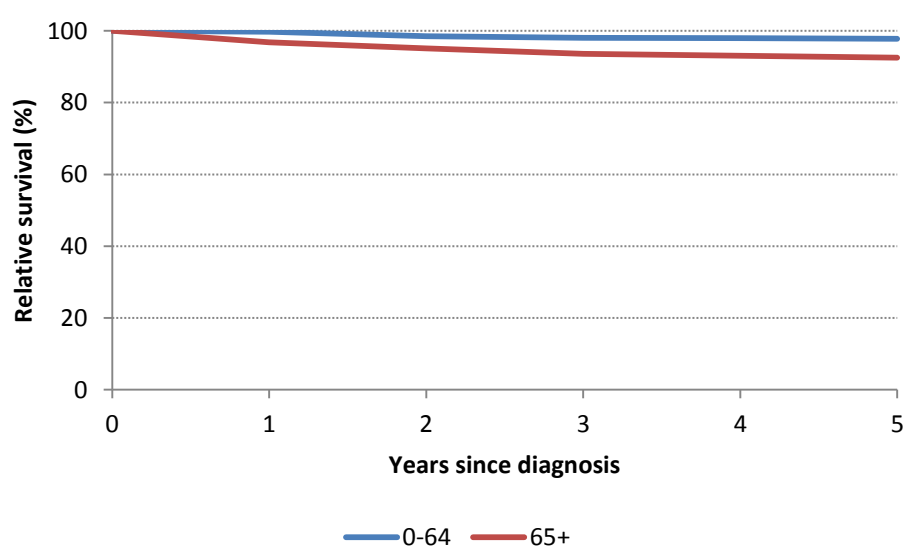
Source: ACT Cancer Registry

Figure 42: Survival by period, prostate cancer, persons, ACT, 1983–2012



Source: ACT Cancer Registry

Figure 43: Survival by age group, prostate cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

o. Stomach cancer (C16)

Five-year relative survival for stomach cancer has not changed significantly over time (25% in the period 1983–1992 and 28% in 2003–2012 (Table 64 and Figure 44).

There was no significant difference in survival for people with stomach cancer under the age of 65 (34%) and those aged 65 and over (27%) (Table 63 and Figure 46).

There was no significant difference in survival between males and females (Table 63 and Figure 45).

Clinical interpretation: Stomach cancer remains a difficult problem with no improvement in relative survival observed over the three decades. There have been some recent improvements in surgical technique, diagnostic procedures and chemotherapy treatment, but as yet these have not been translated into improved overall survival.

Table 61: Summary of new cases, deaths and prevalence for stomach cancer, ACT, 1983–2012

Sex	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Males	400	336	28
Females	227	175	16
Persons	627	511	44

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 62: Relative survival by years after diagnosis for stomach cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	52.0	45.2–58.4
2	35.0	28.6–41.5
3	29.9	23.8–36.3
4	28.5	22.4–34.9
5	28.4	22.2–34.9

Source: ACT Cancer Registry

Table 63: 5-year relative survival for stomach cancer, by sex and age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Sex		
Male	28.6	21.1–36.7
Female	27.6	17.4–39.0
Age at diagnosis		
0–64	30.9	21.5–40.9
65+	26.8	18.9–35.5

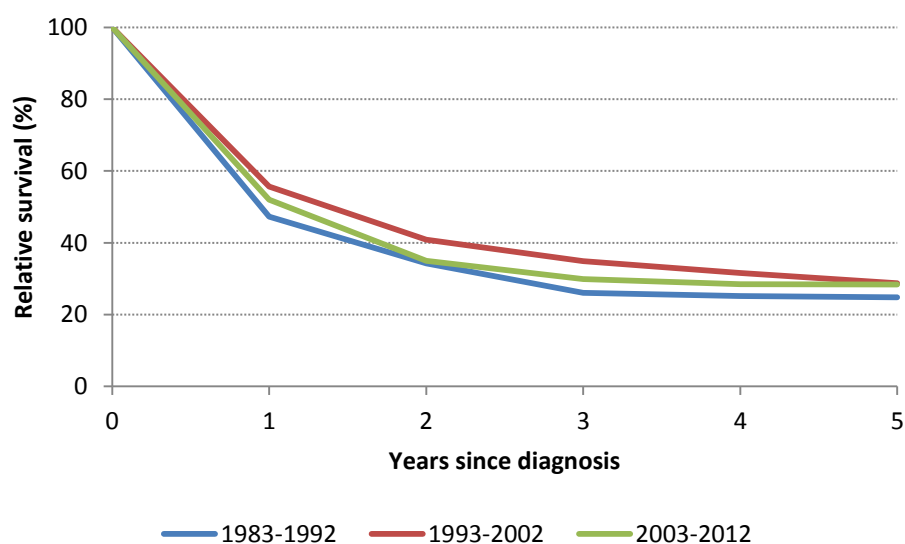
Source: ACT Cancer Registry

Table 64: 5-year relative survival for stomach cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	24.8	18.3–32.0
1993–2002	28.8	22.0–36.0
2003–2012	28.4	22.2–34.9

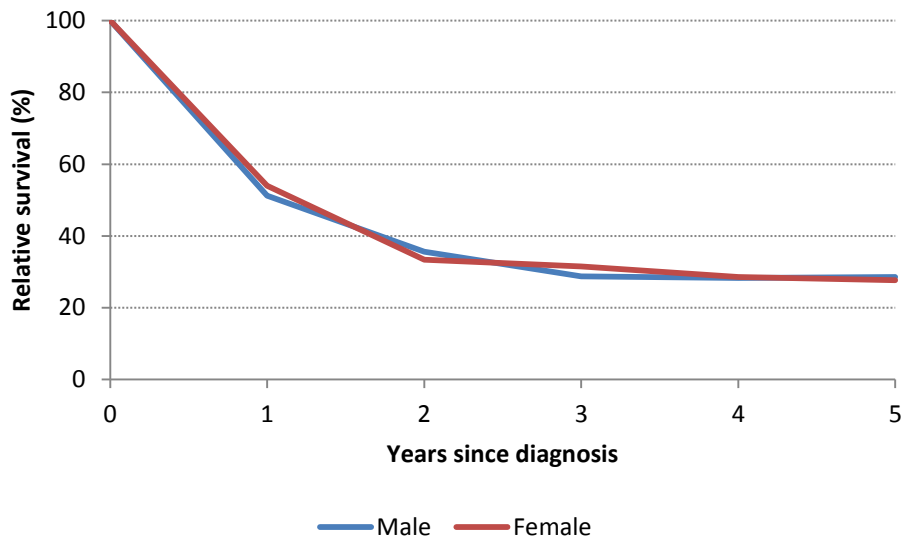
Source: ACT Cancer Registry

Figure 44: Survival by period, stomach cancer, persons, ACT, 1983–2012



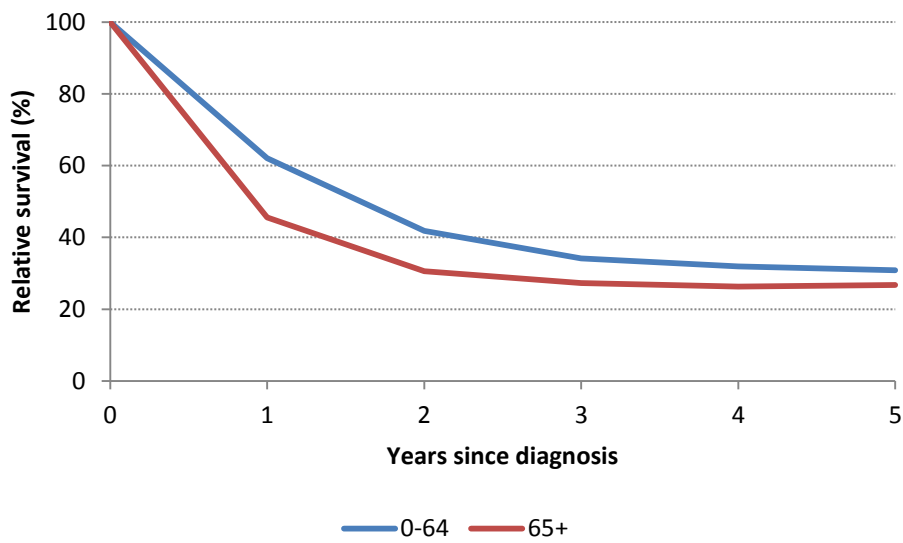
Source: ACT Cancer Registry

Figure 45: Survival by sex, stomach cancer, ACT, 2003–2012



Source: ACT Cancer Registry

Figure 46: Survival by age group, stomach cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

p. Uterine cancer (C54, C55)

Survival estimates for uterine cancer have been included because they are important, however, the number of cases per year is low, resulting in wide confidence intervals for survival estimates. Therefore caution should be applied in interpreting trends.

Five-year relative survival for uterine cancer has not changed significantly over time (84% in the period 1983–1992 and 76% for 2003–2012 (Table 68 and Figure 47).

Women with uterine cancer under the age of 65 had better survival (83%) than those aged 65 and over (65%) (Table 67 and Figure 48). This finding was statistically significant.

Clinical interpretation: Uterine cancer is predominantly treated with surgery and radiation therapy. Although uterine cancer had one of the highest survival estimates for the ACT, there is no clear evidence of improvement. As with many cancers, older persons tend to have a worse outcome, presumably due to tolerability issues around surgery and radiation therapy among elderly women with other medical problems.

Table 65: Summary of new cases, deaths and prevalence for uterine cancer, ACT, 1983–2012

	Number of new cases, 1983–2012	Number of deaths to 2012	5-year prevalence as at end 2012
Females	541	215	127

Note: Prevalence is the number of people living with a previous diagnosis of cancer.

Source: ACT Cancer Registry

Table 66: Relative survival by years after diagnosis for uterine cancer, persons, ACT, 2003–2012

Years after diagnosis	Survival (%)	95% confidence interval
1	91.6	87.3–94.7
2	84.2	78.7–88.6
3	80.4	74.3–85.3
4	78.6	72.2–83.9
5	76.0	69.2–81.7

Source: ACT Cancer Registry

Table 67: 5-year relative survival for uterine cancer, by age-group, ACT, 2003–2012

	5-year survival (%)	95% confidence interval
Age at diagnosis		
0–64	83.2	75.5–88.9
65+	65.0	52.8–75.9

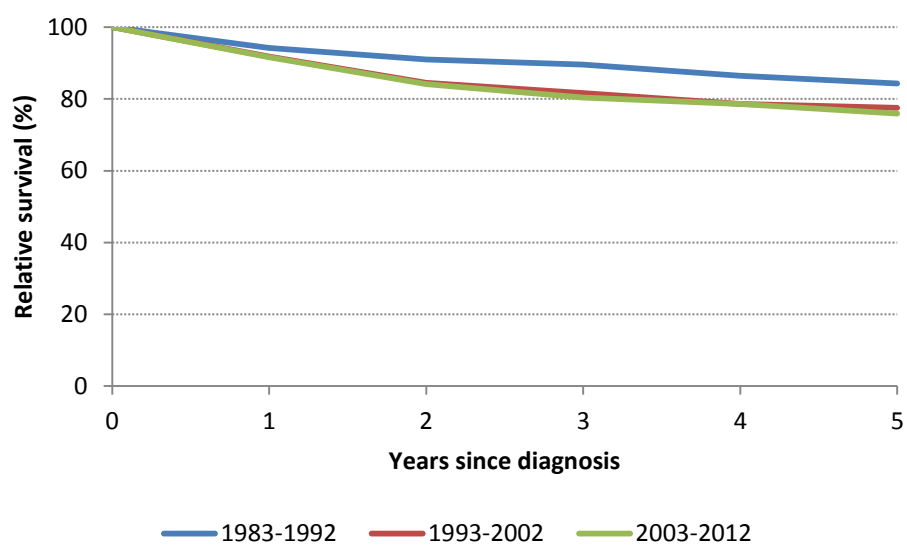
Source: ACT Cancer Registry

Table 68: 5-year relative survival for uterine cancer, by period, persons, ACT, 1983–2012

Period	5-year survival (%)	95% confidence interval
1983–1992	84.3	73.1–92.1
1993–2002	77.6	69.3–84.3
2003–2012	76.0	69.2–81.7

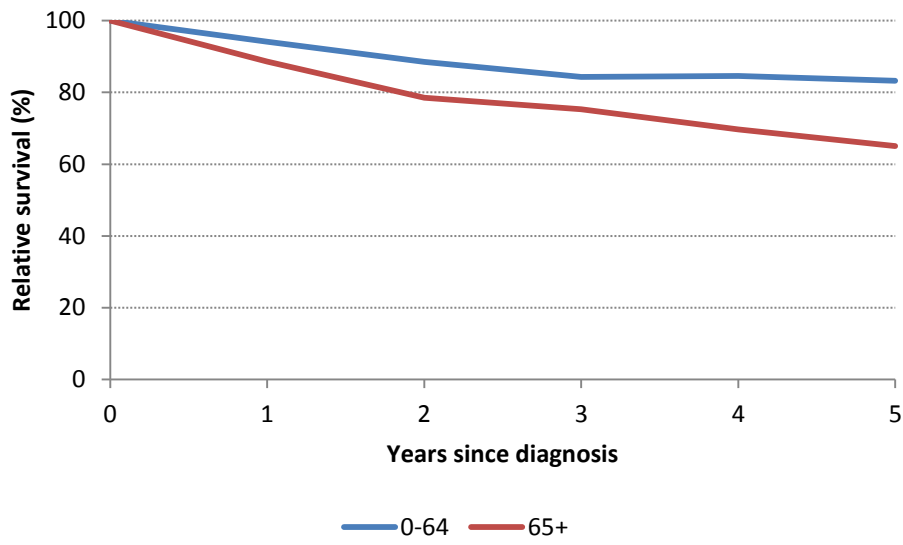
Source: ACT Cancer Registry

Figure 47: Survival by period, uterine cancer, persons, ACT, 1983–2012



Source: ACT Cancer Registry

Figure 48: Survival by age group, uterine cancer, persons, ACT, 2003–2012



Source: ACT Cancer Registry

7. Appendices

a. ICD-10 Codes of cancer sites

Cancers in this report were coded according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10). Histologies were coded according to the International Classification of Diseases for Oncology (ICD-O-3). Table 69 lists the cancer types included in this report along with the relevant ICD-10 code.

Table 69: ICD-10 codes used in this report

Cancer site	ICD-10 Code
All cancers	C00–C96 excluding C44
Bladder	C67
Bowel	C18–C20
Brain	C71
Breast	C50
Head and neck	C01–C14, C30–C32
Kidney	C64–C66, C68
Leukaemias	C91–C95
Liver	C22
Lung	C33, C34
Melanoma of skin	C43
Ovary	C56, C57.0–C57.7
Pancreas	C25
Prostate	C61
Stomach	C16
Uterus	C54, C55

b. Statistical methods

Data for Survival Analysis

The primary data source for this report is the ACT Cancer Registry data collection linked with the National Death Index data to identify people diagnosed with cancer in the ACT but who died interstate. All cases of primary and invasive cancers (excluding non-melanoma skin cancers) diagnosed between 1983 and 2012 were included for the analysis. Records with missing diagnosis date or zero survival time were excluded. Records with age missing or over 100 during the 5-year follow-up period are excluded, since life table data is only available up to age 100. Individuals with multiple primary cancers contributed towards survival analysis more than once. For example, a person with a primary lung cancer and a primary breast cancer was included for survival analysis and prevalence estimation for both cancers.

Relative Survival

The relative survival method was used in this report to estimate cancer survival. Relative survival provides a measure of the survival of people diagnosed with cancer compared with that of the general population (9, 10). Assuming that persons diagnosed with cancer die of causes other than cancer at the same rate as the general population, relative survival is calculated as the ratio between the observed survival of those diagnosed with cancer and the expected survival of the general ACT population, matched for sex, age and calendar year. Expected survival is estimated from life tables of all-cause death rates for the ACT population stratified by age, sex, and calendar year (8). The Ederer II method was used to estimate expected survival (11). The actuarial method (also known as life table method) was used to calculate the survival probability for each time interval (12).

The period approach was used to select persons and follow-up years for survival analysis. Period analysis derives survival estimates exclusively from the survival experience of persons within a certain calendar period. Time at risk is left-truncated at the start of the period window and right-censored at the end. The period approach produces more up-to-date survival estimates that reflect recent changes in trends of cancer survival (5, 13). The main 10-year follow-up period presented in this report is 2003–2012. For comparison, survival estimates for periods 1983–1992 and 1993–2002 were also presented for selected cancers. The Stata command, `strs`, was used for estimating relative survival in this report (12). The modelling method (12) and z-test (based on the standard errors of estimates) was used to compare survival estimates between two periods or groups at the 5% significance level. For comparison with previous ACT reports and other Australian reports, survival estimates using the cohort method were also presented for selected cancers in Appendix d.

Limited Duration Prevalence

To provide context to survival estimates, age-standardised cancer incidence and limited-duration prevalence in ACT are presented. Limited-duration prevalence (LDP) represents the number of living people who were diagnosed with cancer within a given time period up to a specific date. The ACT Cancer Registry does not have sufficient records to calculate complete prevalence (the number of living people who were ever diagnosed with cancer). In this report, the 5-year limited-duration prevalence, as at 31 of December 2012, is presented for selected cancers. For all cancers combined, the 1-year, 5-year and 10-year limited-duration prevalence are presented.

c. Incidence (2011–2015) and mortality (2010–2014) of cancer in the ACT

Table 70: Cancer incidence (2011–2015) and mortality (2010–2014), ACT

Site	Incidence 2011–2015		Mortality 2010–2014	
	Number	Age-standardised rate (per 100,000 per year)	Number	Age-standardised rate (per 100,000 per year)
All cancers	8177	449.4	2328	135.9
Bladder	159	9.3	51	3.2
Bowel	971	54.7	316	18.7
Brain	125	6.8	82	4.5
Breast (female)	1276	132.3	198	21.1
Head & Neck	207	11.1	53	3.0
Kidney	268	14.9	76	4.5
All leukaemias	225	12.2	70	4.2
Liver	123	6.7	68	3.8
Lung	544	31.0	374	22.4
Melanoma	768	41.9	77	4.4
Ovary	108	11.2	43	4.6
Pancreas	233	13.4	156	9.3
Prostate	1299	149.6	161	21.4
Stomach	121	6.8	71	4.1
Uterine	178	18.2	33	3.6

Note: Rates were standardised to the 2001 Australian population.

Source: ACT Cancer Registry

d. Comparison of cancer survival in the ACT using the cohort method

The tables below show survival estimates using two different methods for comparison. Table 71 shows the survival estimates presented throughout this report using the period method for 2003–2012. Relative survival estimates using the cohort method are presented in Table 72 for people diagnosed in 2000–2009 with follow-up until the end of 2012. For most cancers, the estimates of survival using the cohort method were similar to estimates using the period method.

Table 71: Summary of 5-year relative survival estimates using the Period method, 2003–2012

Site	Persons		Male		Female	
	Relative survival	95% CI	Relative survival	95% CI	Relative survival	95% CI
All cancers	70.9	70.0–71.8	69.9	68.6–71.2	72.1	70.8–73.3
Bladder	58.7	50.8–66.2	62.0	52.7–70.7	48.1	33.1–62.7
Bowel	70.3	67.6–72.8	68.4	64.8–71.9	72.5	68.6–76.1
Brain	25.5	19.6–31.9	22.6	15.1–31.1	28.7	19.7–38.4
Breast	91.5	89.8–92.9	N/A	N/A	91.5	89.8–92.9
Head & Neck	60.1	53.6–66.2	61.0	52.9–68.5	58.0	46.6–68.0
Kidney	69.9	64.2–75.0	69.3	62.1–75.9	70.5	61.1–78.5
All leukaemias	66.3	60.8–71.3	63.9	56.9–70.4	70.0	61.2–77.7
Liver	14.7	9.0–21.7	13.8	7.2–22.8	15.6	6.7–27.8
Lung	19.2	16.6–22.1	17.1	13.7–20.8	21.8	17.6–26.3
Melanoma	90.8	88.4–92.9	88.6	85.1–91.7	93.4	90.2–96.0
Ovary	50.4	42.4–57.9	N/A	N/A	50.4	42.4–57.9
Pancreas	9.6	6.0–14.2	11.1	5.9–18.4	8.5	4.1–14.8
Prostate	94.9	93.1–96.6	94.9	93.1–96.6	N/A	N/A
Stomach	28.4	22.2–34.9	28.6	21.1–36.7	27.6	17.4–39.0
Uterine	76.0	69.2–81.7	N/A	N/A	76.0	69.2–81.7

Source: ACT Cancer Registry

Table 72: Summary of 5-year relative survival estimates using the Cohort method, diagnosed 2000–2009

Site	Persons		Male		Female	
	Relative survival	95% CI	Relative survival	95% CI	Relative survival	95% CI
All cancers	70.5	69.6–71.4	69.3	68.0–70.6	71.9	70.6–73.2
Bladder	59.9	52.0–67.4	63.1	53.9–71.7	50.4	35.3–64.8
Bowel	69.0	65.7–72.3	67.5	62.7–72.1	70.6	65.8–75.0
Brain	23.2	17.6–29.3	20.6	13.6–28.7	26.4	17.8–35.9
Breast	91.5	89.8–93.0	N/A	N/A	91.5	89.8–93.0
Head & Neck	58.8	52.3–64.9	57.5	49.5–64.9	61.7	50.0–71.7
Kidney	69.8	64.0–75.1	69.8	62.3–76.5	69.7	60.2–77.9
All leukaemias	65.1	59.7–70.2	62.5	55.5–68.9	69.7	60.6–77.6
Liver	13.7	8.0–21.0	13.1	6.5–22.1	15.0	5.8–28.5
Lung	20.0	17.2–23.0	18.2	14.6–22.2	22.3	17.9–27.1
Melanoma	91.7	89.3–93.8	89.1	85.5–92.3	94.7	91.6–97.2
Ovary	48.2	40.3–55.7	N/A	N/A	48.2	40.3–55.7
Pancreas	7.8	4.5–12.2	7.9	3.6–14.3	7.7	3.3–14.6
Prostate	94.2	92.3–96.0	94.2	92.3–96.0	N/A	N/A
Stomach	30.3	23.8–37.1	29.2	21.3–37.8	32.3	21.7–43.7
Uterine	76.4	69.5–82.4	N/A	N/A	76.4	69.5–82.4

Source: ACT Cancer Registry

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