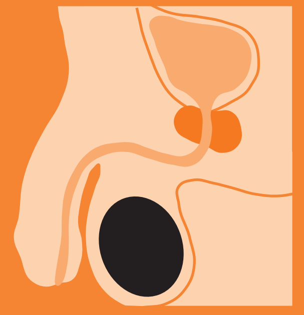
Canstat



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Canstat: A digest of facts and figures on cancer

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Testicular Cancer

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Anti-Cancer Council
of Victoria

134 Victorian men were diagnosed with testicular cancer in 1998.

This cancer is a disease of young men with half of new diagnoses being made in men aged under 33 years.

Overview

Cancer of the testis is a relatively uncommon cancer, ranking fifteenth in the leading new cancer sites for Victorian men. In 1998, 134 Victorian men were diagnosed with testicular cancer with a median age of 33 years. The age-standardised incidence rate in 1998 (standardised to the World Standard Population) was 5.3 per 100,000 men and the lifetime risk (to 75 years) of being diagnosed with testicular cancer was about one in 250 men.

In 1998, 6 men died from testicular cancer in Victoria, with an age-standardised mortality rate of 0.2 per 100,000 men.

Incidence and mortality

Figure 1 illustrates the age-specific incidence and mortality rates for the period 1994–7. Testicular cancer is predominantly a disease of younger men with the peak of incidence in men aged 25–39 years. Less than 25% of diagnoses are made in men over 40 years. The mortality rates are low for this cancer.

Histological types

The proportion of testicular cancers that are histologically verified is very high, and rose from 97% in 1982–5 to 98.5% in 1994–7. Of 531 histologically verified testicular cancers diagnosed in the latter period, over half (54.2%) were pure seminomas, 43.7% non-seminomatous germ cell tumours (NSGCT), and 2.1% other tumour types. Men diagnosed with seminoma were significantly older (median age 35, range 19–83 years) than those with NSGCT (median 28, range 0–67 years). A more detailed breakdown of tumour morphology is shown in **Figure 2** for all men diagnosed in the 16 years from 1982–97. The stromal tumours comprised Sertoli and Leydig cell tumours and other tumours included mostly rhabdomyosarcoma and other sarcomas. The different types of NSGCT have been indicated on the graph.

Pathological stage

Staging is not routinely collected for testicular cancers in Victoria. However, staging for all Victorian men whose testicular cancers were diagnosed from 1988-1993 was included in a survey of clinical management. Of 633 men included in the survey, 357 had pure seminoma, 271 had NSGCT, and 4 had other tumours. The stage distribution of seminoma and NSGCT is shown in **Figure 3**.

Figure 1

Age specific incidence and mortality rates for testicular cancer, Victoria 1994–7

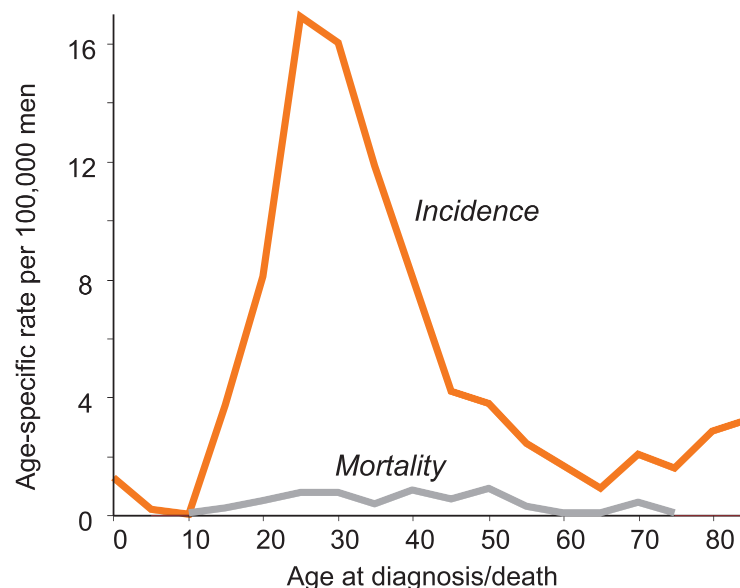


Figure 2

Distribution of testicular cancer by histological type, Victoria 1982–97

NSGCT = Non-seminomatous germ cell tumours

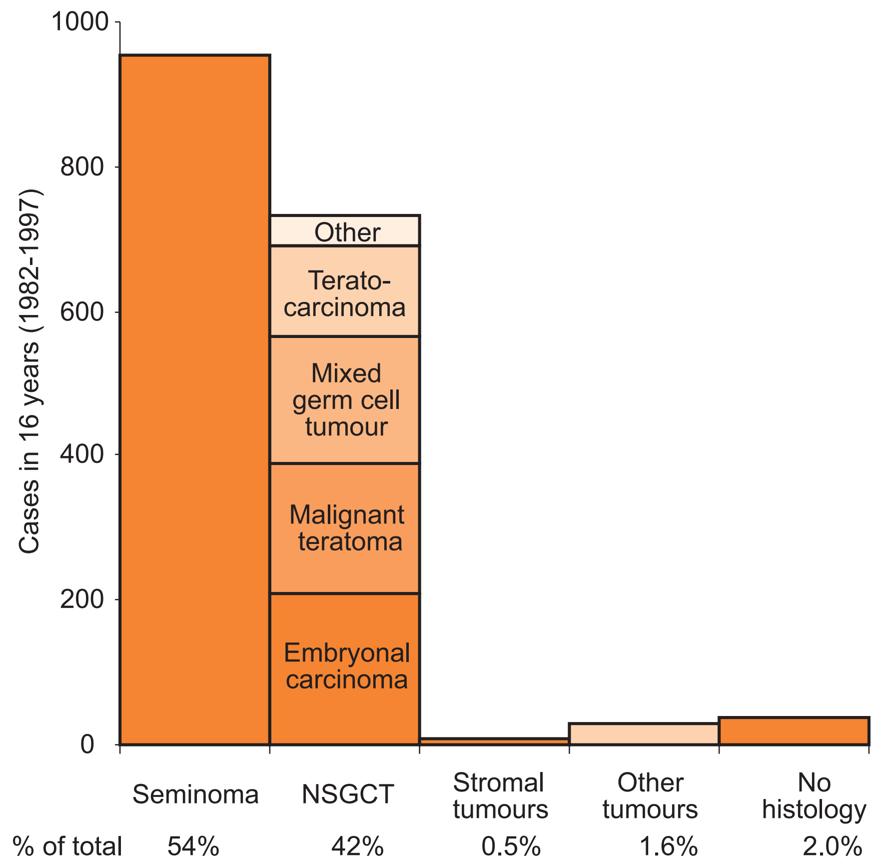
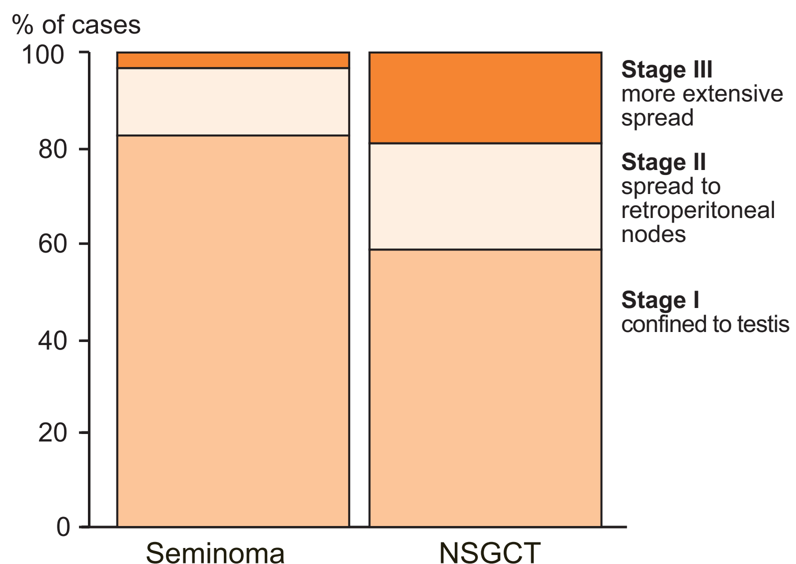


Figure 3

Distribution of seminoma and NSGCT by stage in men from the testicular cancer management survey (diagnosed 1988–93 in Victoria)



Testicular cancer rates in Australia are close to those observed in the UK and other European countries.

Australian-born Victorians have a higher rate of testicular cancer than migrants from Southern Europe, Asia and the Middle East but similar rates to migrants from the UK and Europe.

Population variation

International comparisons

Figure 4 shows a range of age-standardised incidence rates (to World Standard Population) for testicular cancer from registries included in Volume VII of Cancer Incidence in Five Continents[1], covering the years 1988-1992. During this period the highest rates in the world were observed in Denmark (annual rate of 9.2 new cases per 100,000 men), New-Zealand non-Maoris (5.6) and American whites (5.4). Australian rates (3.5–4.9) were similar to those of the UK and other European countries. The lowest rates were observed in Asia, and for American blacks.

Worldwide national estimates of testicular cancer incidence in 1990[2] show a similar pattern with Scandinavia, Germany, Austria and Switzerland having the highest rates, and countries of Africa and Asia the lowest. Australia (estimated incidence 3.8 per 100,000 men) had a rate which ranked with Canada, the UK and USA in the middle of the worldwide range which varied from 9.5 in Denmark to <1.0 in Asia and Africa.

There is some variation in the distribution of testicular cancer by histological type between countries with the ratio of seminoma to NSGCT varying from 0.9:1 in the USA and Sweden to 1.7:1 in Japan. Histological verification of tumours is around 98-99% in all the countries listed and there do not appear to be differences in coding conventions. Therefore, the observed geographic variation would seem to be genuine and may reflect variation in exposure to environmental risk factors.

Worldwide mortality estimates[3] generally showed a similar pattern though some African and Asian regions ranked higher for mortality than for incidence. No country had an age-standardised mortality rate of >1 per 100,000 men and the Australian rate (0.3 per 100,000 men) was less than half that of the leading country, Denmark.

Migrants

Within Australia there exist population subgroups that experience different risks of testicular cancer. **Figure 5** compares the age-standardised (to World Standard Population) testicular cancer incidence rates for various migrant groups with men who were born in Australia. It can be seen from the graph that men who migrated from countries of southern Europe, the Middle East and Asia have rates of testicular cancer which are significantly lower than Australian-born men. The rates in migrants from the UK and other northern and eastern European countries do not differ significantly from the Australian-born rates.

Similar patterns were observed in the USA between 1990 and 1996[4]. Rates were highest in non-Hispanic whites (5.5 per 100,000 males) than in all other groups (Hispanics 3.1, Blacks 0.9 per 100,000 men).

[1] *Parkin DM, Whelan SL, Ferlay J, Raymond L & Young J eds (1997) Cancer Incidence in Five Continents, Vol VII (IARC Scientific Publications No. 143) Lyon, IARC.*

[2] *Parkin DM, Pisani P, Ferlay J. Estimates of worldwide incidence of 25 major cancers in 1990. Int J Cancer 1999 Mar 15;80(6): 827-41.*

[3] *Pisani P, Parkin DM, Bray F, Ferlay J. Estimates of worldwide incidence of 25 major cancers on 1990. Int J Cancer 1999 Mar 15;80(6):827-41.*

[4] *Ries LAG, Kosary CL, Hankey BF, Miller BA, Clegg L, Edwards BK eds (1999) SEER Cancer Statistics Review 1973-1996. N.C.I, Bethesda, MD.*

Figure 4

International incidence of testicular cancer 1988-1992

The countries chosen for international comparisons are from registries included in Cancer Incidence in Five Continents Vol VII [1].

They include New Zealand (non-Maori), USA (SEER whites), Italy (Parma), Israel (all Jews), UK (England & Wales), Japan (Miyagi), China (Shanghai) and Poland (Cracow City).

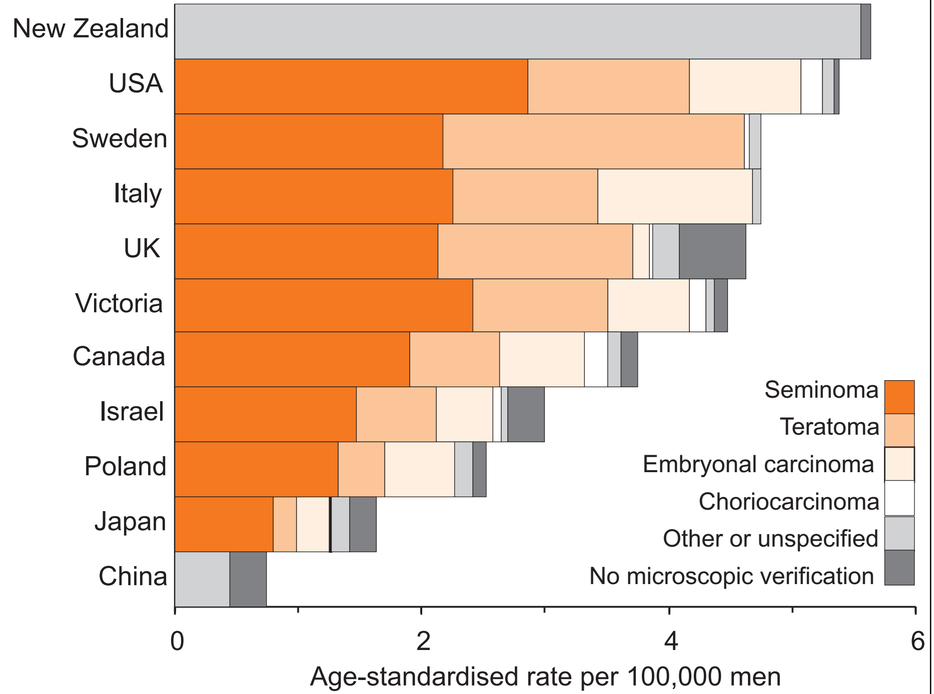
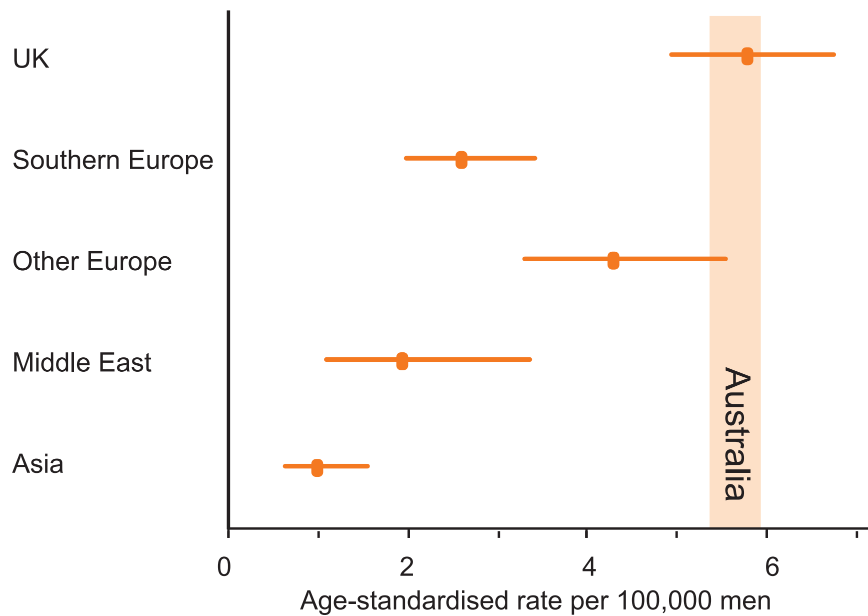


Figure 5

Testicular cancer incidence in Victoria by region of birth 1994-1997

In this graph the vertical bar represents the 95% confidence interval for the Australian-born rate. For other regions of birth, age standardised rates are shown with their 95% confidence intervals drawn as horizontal lines (the wider the confidence interval, the smaller the number of events).



Testicular cancer incidence is rising in Victoria by 2.2% per year while mortality is decreasing by 2.6% per year reflecting improvements in treatment.

Time Trends

Figure 6 shows trends in testicular cancer incidence and mortality in Victoria from 1982–97.

Trends in incidence

The incidence of testicular cancer has increased steadily in Victoria since 1982 on average rate by 2.2% per annum. This increase has not been uniform across all age groups as can be seen from the age-specific curves by median year of birth in **Figure 7**. Whilst the curves are dominated by fluctuations due to small numbers, it is clear that the increase in incidence has been greatest in men between the ages of 20 and 50. Incidence rose in Seminoma across all ages and in NSGCT only in younger men (data not shown).

International studies have also widely reported increasing incidence of testicular cancer. For example,

- England and Wales (1962–90) Incidence rose by 3.4% p.a. with rises observed in seminomas across all age groups, and in NSGCT only in men under 55 years. Cohort analysis showed marked increase in incidence in young men up to the cohort born in 1955-59, but no further rise in those born subsequently.[1]
- USA (1979–95) Incidence rose by 4.3% p.a. A strong birth cohort effect was observed with peak age at diagnosis decreasing in successive cohorts.[2]
- Six European countries (1945–89) Rates of increase ranged from Sweden 2.3% p.a. to East Germany 5.2% p.a. Birth cohort was found to be a stronger determinant of risk than calendar year with little variation occurring in men born before 1920 and an increasing trend thereafter.[3]
- Canada (1969–93). Incidence was increasing at an annual rate of 2.3% with increases largely attributable to a birth cohort effect. Men born from 1959–68 were twice as likely to develop testicular cancer as those born in 1904–13.[4]

Many studies found strong associations between increasing incidence and birth cohort with an increasing trend in men born since the 1920s. That birth cohort appears to be more related than calendar year to increasing incidence rates suggests that changing exposures to unknown environmental risk factors very early in life, or even in utero, may be responsible.

Trends in mortality

Whilst incidence rates have risen in Victoria, there has been a decrease in the mortality rate from testicular cancer since 1982 of about 2.6% per annum. This reflects improvements in treatment using chemotherapy and radiotherapy over the last two decades.

The longer term Australian mortality trends shown in **Figure 8** show a steady increase in mortality from testicular cancer from the turn of the century until the mid-1960s, followed by a rapid decrease after the introduction of modern treatments. Whilst the graph looks quite dramatic, the scale is large and it should be noted that the annual death rate has never reached 1 per 100,000 men.

[1] dos Santos Silva I, Swerdlow AJ, Stuiller CA, Reid A. Incidence of testicular germ-cell malignancies in England & Wales. Trends in children compared with adults. Int J Cancer 1999 Nov 26;83(5):630–4.

[2] McKiernan JM, Goluboff ET, Liberson GL, Golden R, Fisch H. Rising risk of testicular cancer by birth cohort in the United States from 1973 to 1995. J Urol 1999 Aug: 162(2):361-3.

[3] Bergstrom R, Adami HO, Mohner M, Zatonski et al. Increase in testicular cancer incidence in six European countries: a birth cohort phenomenon. J Natl Cancer Inst 1996 Jun 5;88(11):727-33.

4 Liu S, Wen SW, Mao Y, Mery L, Rouleau J. Birth cohort effects underlying the increasing testicular cancer incidence in Canada. Can J Public Health 1999 May-Jun; 90(3):176-80.

Figure 6

Trends in testicular cancer incidence and mortality, Victoria 1982–97

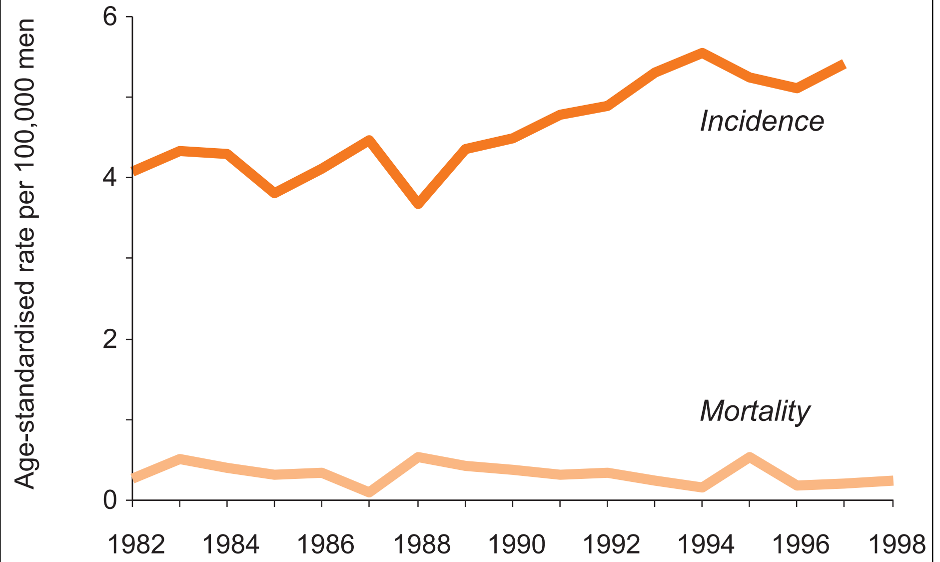


Figure 7

Age-specific testicular cancer incidence by median year of birth, Victoria 1982–97

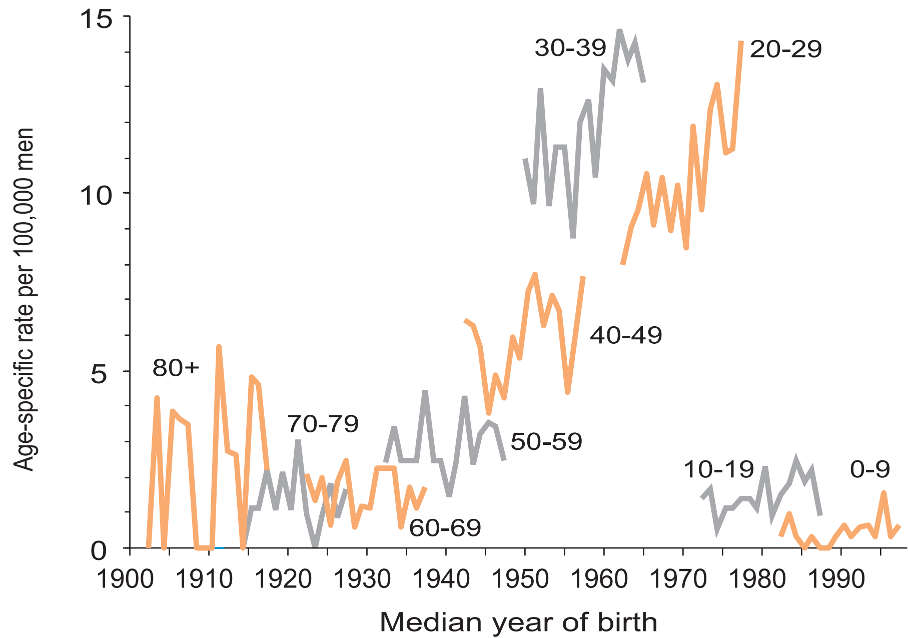
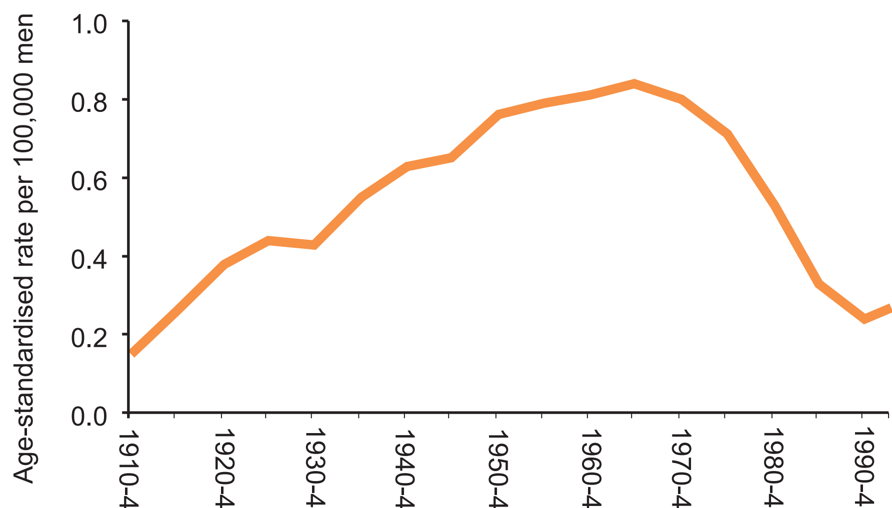


Figure 8

Trends in testicular cancer mortality, Australia 1910–98



Survival

Overall survival from testicular cancer has steadily improved over the last three decades reflecting advances in treatment with chemotherapy and radiotherapy.

In the USA the SEER registries report a 5-year relative survival of 95% for men diagnosed in 1989–95. This is significantly different from the 79% reported for men diagnosed in 1974–76. Survival of almost 99% was achieved in men with localised disease, 97% with regional disease and 74% in patients presenting with distant metastases.

A survey of management of testicular cancer was conducted for all men diagnosed in Victoria between 1988 and 1993 (with a response rate of 95%). Five-year relative survival was calculated for these 633 men by various prognostic factors. The findings are summarised in **Table 1**. A multivariate analysis comparing different treatments will be conducted when 10 years of follow-up have been accumulated —at 5 years, insufficient deaths had occurred to identify meaningful differences.

Table 1:

Five-year relative survival (%) for Victorian men diagnosed with testicular cancer in 1988–93.

	N	5–year survival
All men	633	95
Age group		
<30	247	96
30-49	338	98
50+	48	78
Tumour type		
Seminoma	357	99
NSGCT	271	91
Other	4	65
Tumour stage		
Stage I	457	99
Stage II	112	96
Stage III	64	73

Please pass this issue of **Canstat** on to anyone who is interested.

The Anti-Cancer Council of Victoria is an independent volunteer-based charity which relies on public support to maintain vital education and patient welfare programs and to fund major scientific and behavioural research projects. This task is made possible by the generosity of Victorians, a staff of 200 and the commitment of over 20,000 volunteers and supporters.

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