

Glossary

See also the Methods Appendix in *Cancer Survival in Australia, 2001 Part 1* (AIHW & AACR 2001).

Confidence intervals

Where indicators include a comparison between time periods and age groups, rates are presented with a 95% confidence interval. This is because the observed value of a rate may vary due to chance even where there is no variation in the underlying value of the rate. The 95% confidence interval represents a range over which variation in the observed rate is consistent with this chance variation. These confidence intervals can be used as an approximate test of whether changes in a particular rate are consistent with chance variation. Where the confidence intervals do not overlap, the difference in rates is greater than that which could be explained by chance. Where the intervals do overlap, then differences in the rates may be due to chance, and thus are not statistically significant.

Hazard rates

Estimation of relative survival requires hazard rates by single-year ages for each year of follow-up. These hazard rates, λ_x , were calculated from life table information using the formula:

$$\lambda_x = -\ln(1 - q_x)$$

where q_x is the probability of dying between exact ages x and $x+1$ and is calculated using the following standard approximation:

$$q_x = \frac{M_x}{(1 + M_x(1 - a_x))}$$

where M_x is the age-specific death rate of persons aged x

a_x is the assumed fraction of a year lived by those who die during the year.

The following assumptions were made for a_x :

- $a_0 = 0.9$ because deaths among the very young in Australia tend to be concentrated early in the first year of life
- $a_1 - a_{99} = 0.5$ because those who die in the year will live, on average, half of a year during that year.

Life tables

Life tables by sex and single-year ages (0-99 years) were obtained from the ABS for Australia, and for geographic zones (classified by RRMA) for each year from 1982 to 1997. The method used to calculate the life tables is outlined by the Australian Government Actuary (1999) in *Australian Life Tables 1995-1997*. The total number of deaths that occurred

in each year by individual age (0 to 99) and sex were then linked to the respective populations to determine hazard rates.

National Cancer Statistics Clearing House

Each year the National Cancer Statistics Clearing House at AIHW receives from the eight state and territory cancer registries data on new cases of cancer diagnosed in residents of Australia. This commenced with cases first diagnosed in 1982. The data provided to the Clearing House enable record linkage to be performed and the analysis of cancer by site and behaviour.

Data used in the relative survival analysis in this report were for the period 1 January 1992 to 31 December 1997 for new cases of cancer and for the period 1 January 1992 to 31 December 1999 for deaths.

National Death Index

The National Death Index is a database maintained by the AIHW. It contains data on all deaths that have occurred in Australia since 1980. The data contained in the Index come from state and territory Registrars of Births, Deaths and Marriages.

As part of normal National Cancer Statistics Clearing House operating practices, the Clearing House is regularly linked to the National Death Index. This linkage is undertaken to assist state and territory cancer registries to identify deaths occurring interstate or that were not notified to the cancer register.

In the analyses in this report follow-up cancer survival analysis finished at 31 December 1999. This cut-off date provided at least 2 years of follow-up for the persons diagnosed with cancer during 1997.

Relative survival

Relative survival is defined as the ratio of the observed survival rate for a given cohort of patients to the expected survival rate (Ederer, Axtell & Cutler 1961). The expected survival rate is the rate that the patient group should have experienced based on the life table of the general population from which they were diagnosed (Estève et al. 1990).

For example, in the general population during 1992–1997, the expected proportion of males aged 60–69 years who survive for the next five years is 90.6%. The observed survival rate after five years for males diagnosed with lung cancer at age 60–69 is 10.8%. The five-year relative survival proportion for males diagnosed with lung cancer at age 60–69 is the ratio of these two percentages ($10.8/90.6$), that is 0.119, or 11.9%.

Significance

In this report significant differences mean differences which statistically are significantly different at the 95% confidence level. See 'Confidence intervals' for methodology for statistically significant differences.

The relative survival analysis in this report was undertaken using the SAS statistical software functions as developed by the Mayo Foundation in 1994 (Therneau et al. 1994). This code was developed by Terry Therneau in 1994 using SAS Version 8.1. Staff at Queensland

Health further adapted and developed the code for local use (Baade, Coory & Ring 2000). AIHW staff then further developed the code to handle national level data. The resultant program calculates expected survival using the life table method and estimates relative survival using a Cox proportional hazards regression.

Results using this method will produce estimates which will be slightly different to those produced by the New South Wales and Western Australian Cancer Registries which used the RELSURV package as developed by Hedelin, and the South Australian Cancer Registry who used the SERV2 package as developed by Voutilainen. The results will also be slightly different to those produced by the AIHW *in Breast Cancer Survival in Australian Women 1982–1994* which used RELSURV to produce its estimates.

Topography codes

Table A.1: Topography codes for International Classification of Diseases, 9th revision (ICD-9) used in this report

ICD-9 code	Cancer name
All cancers	All cancers excluding ICD-9 173 (non-melanocytic skin cancer)
153, 154	Colorectal cancer
162	Cancer of the lung
172	Melanoma of the skin
174	Cancer of the breast (female)
180	Cancer of the cervix
185	Cancer of the prostate
200, 202	Non-Hodgkin's lymphoma

Whole patient equivalent (WPE)

The whole patient equivalent (WPE) is derived by the Department of Health and Ageing as an indicator of patient load as follows:

- If a patient has visited only one general practice during a financial year, that patient will be counted as one WPE for the practice.
- If a patient visits more than one general practice, the patient will be counted as a fraction of a WPE for each practice visited.

References

A comprehensive bibliography may be found in *Cancer Survival in Australia, 2001 Part 1* (AIHW & AACR 2001).

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