

All cancer

- » There were 36,043 new cases of cancer in 2007 and 50,967 cases are projected in 2021.
- » Incidence rates in males increased by 11 per cent in the past 10 years. However, the pattern has fluctuated largely due to an increase in prostate cancer incidence. In 2002, incidence rates for males increased and have remained at the same level between 2003 and 2007. Incidence rates in females did not statistically significantly change over the 10-year period, but show a decline over the past six years.
- » Mortality rates have declined by 13 per cent in males and 6.4 per cent in females in the past 10 years.
- » The likelihood or risk of developing cancer is one in two in males and one in three in females by the age of 85.
- » Adenocarcinoma is the most common cell type of cancer, accounting for 54 per cent of all new cases in 2007.

In 2007, there were 36,043 new cases of cancer in NSW (20,689 male, 15,354 female). Of the 13,227 deaths from cancer, 7,466 were in males and 5,761 in females. Allowing for differences in age, males were 1.5 times more likely to be diagnosed with cancer than females and 1.6 times more likely to die from cancer.

Crude incidence rates (cases per 100,000) were 606.5 in males and 441.6 in females. Corresponding incidence rates (adjusted for age and standardised to the Australian 2001 population) were 594.4 and 389.4 respectively.^{xvii} Crude mortality rates (deaths per 100,000) were 218.9 in males and 165.7 in females and mortality rates (adjusted for age and standardised to the 2001 population) were 220.8 in males and 135.9 deaths in females per 100,000.

Based on 2007 figures, one in three males and one in four females would develop cancer by the age of 75 years and one in two males and one in three females would develop cancer by the age of 85 years.

Projections of incidence and mortality

In 2009, the estimated number of new cases of cancer is expected to increase to 38,116 new cases: 22,154 in males and 15,962 in females.^{xviii} Incidence rates are estimated to increase to 607.1 new cases per 100,000 in males and remain at 2007 levels with 390.7 in females.

The number of deaths is expected to increase to 13,739 deaths overall: 7,652 cancer deaths in males and 6,087 in females. Mortality rates are expected to decline to 214.2 deaths per 100,000 in males and increase slightly to 138.1 deaths per 100,000 in females.

While the projected number of new cases and deaths based on historical trends provide a reasonable basis for estimates, they do assume that historical patterns will continue in the future.

Longer term, incidence rates for cancer will remain at 2007 levels in males, with 593.5 per 100,000 expected in 2021. They will increase slightly in females with a rate of 430.4 per 100,000 expected in 2021. Mortality rates for the same time period are expected to decline to 165.3 per 100,000 in males and 117.3 per 100,000 in females in 2021. Rates and numbers are presented in Table 27.

Table 27
Long-term cancer projections for cancer, NSW, 2011–2021

Sex	2011 cases	2016 cases	2021 cases	2011 deaths	2016 deaths	2021 deaths
Males	22,367	25,505	28,789	7,655	7,946	8,215
Females	17,505	19,705	22,178	6,114	6,488	6,936
Total	39,872	45,210	50,967	13,769	14,434	15,151
ASR males	581.8	587.6	593.5	202.9	184.1	165.3
ASR females	410.2	420.3	430.4	132.0	124.4	117.3

xvii. Unless otherwise stated rates are age standardised to the 2001 Australian population. Rates standardised to the standard 'world' population are presented in Tables 4 to 15 and rates are provided for Australian 2001 and World standard populations in all tables. Rates standardised to the World population will always be lower because the age structure is the 1960 world population which gives a greater weighting to younger populations.

xviii. You H, Baker D, Bishop JF. Cancer incidence and mortality projections in New South Wales, 2008 to 2011. Sydney: Cancer Institute NSW, in publication.

Time trends – overall

The percentage change in incidence and mortality rates for cancer for the period 1998 to 2007 is presented overall. Only statistically significant changes are mentioned.

Between 1998 and 2007 incidence rates for rose by 11.1 per cent in males but did not statistically significantly change in females. However, in the last six years incidence rates in females have started to decline and mortality rates fell by 12.9 per cent in males and by 6.4 per cent in females.

Table 28
Numbers of new cases of cancer by age group, 2007

Age (yr)	0–49	50–64	65–79	80 plus	Total
Males	1,991	5,998	8,940	3,760	20,689
Females	2,826	4,527	4,901	3,100	15,354

Rates rose with increasing age in both sexes. From 0 to 14 years, leukaemia was the most common cancer, followed by melanoma in males and females from ages 15 to 34 years. Breast cancer was the most common cancer in people aged 30 to 49 years with 981 cases or 24 per cent of cases in this age range. The most common cancer for the 50 to 64 and 55 to 79 age groups was prostate cancer with a fifth of all cases, followed by breast, bowel, melanoma and lung cancer. For people aged 80 years and older, bowel cancer was the most commonly diagnosed cancer followed by prostate, lung and melanoma.

In 1977, the median age at diagnosis of cancer in NSW was 65 in males and 62 in females. The median age increased to 69 in males and 66 in females in 1997 and declined a year to 68 years in males and 65 years in females in 2007.

The median age at death in males has increased from 68 in 1977 to 72 in 1997 and 74 in 2007. The median age of death in females increased from 67 in 1977 to 72 in 1997 and 75 in 2007. Increases in the median age at death over time most likely indicate improvements in survival, earlier diagnosis and treatment.

Time trends – by histological type

Trends over time have been considered by the cell type or histology of the cancer for males and females. Carcinoma is a common type of cancer that originates in a type of tissue that covers and lines body surfaces and cavities called epithelium. Epithelium is classified according to three criteria: the number of cell layers; the shape of the cells; and the presence of surface specialisation. For example, a single layer of cells is called simple epithelium, whereas more than one layer is called stratified. The shape of cell is another factor. Some cells are flat or pavement like and are called squamous. Some cells are square or cube shaped (cuboidal), others are elongated or column shaped (columnar).^{xix}

On the surface of the epithelial cells there can be small hairs or cilia or a protein substance called keratin, which can provide protection. Therefore, squamous cell carcinoma is a type of cancer found lining a body cavity where the pavement like cells or squamous cells have grown and multiplied and have started to invade the surrounding organ. In the lungs, the main cell type is simple squamous: this is a single layer of cells that allow exchange of oxygen and carbon dioxide. Other parts of the body, such as the mouth, anus, vagina and outer skin have stratified squamous epithelium because these parts of the body require protection. Squamous cell carcinomas as a dominant cell type of cancer were found in head and neck cancers, oesophageal cancers, lung cancers, cervical cancers and in a modified form called transitional cell cancers in bladder cancer. These cancer sites share similar risk factors, with the most dominant being current or previous tobacco smoking. In the case of oesophageal cancer alcohol consumption is also an established risk factor, as is HPV for cervical cancer.

Sometimes the lining or epithelium folds into the tissue underneath and becomes a gland. These glands secrete on to the surface of the epithelium and when these cells become malignant they are referred to as adenocarcinoma. Depending on their location they are called adenocarcinoma of the bowel, breast, prostate, lung and pancreas.

xix. Wheeler P.R. Burkett H.G. Daniels V.G Functional Histology: A text and colour atlas. Churchill Livingstone 1982.

Apart from carcinomas there are other cancers, such as sarcomas, which may arise from bone, muscle or connective tissue. These are called osteosarcomas or leiomyosarcomas. Other types of cancer include those that originate in blood and blood-forming organs (bone marrow, spleen, and thymus). These are called leukaemias (abnormal growth of a type of white blood cell called a leukocyte), lymphomas (cancer of that begins in the lymphocytes of the immune system) and multiple myeloma (cancer of a special type of white blood cell called a plasma cell).

In 2007, the most common histological type of cancer in NSW was adenocarcinoma, with 54 per cent of cases (53.4 per cent in males and 55.9 per cent in females). The second most common category was other specific types of cancer with 13.8 per cent of total cases (14.5 per cent in males and 12.9 per cent in females). Squamous cell carcinoma was the third most common type of cancer with 8.6 per cent of total cases (9.6 per cent in males and 7.3 per cent in females). Cancer types included in this category are melanomas, brain cancers and germ cell tumours.

Unspecified carcinoma was responsible for 6.3 per cent of cases (6.0 per cent in males and 6.8 percent in females). This cell type is epithelial in origin and is therefore found lining an organ. However, the carcinoma is not clearly differentiated enough to determine what type of carcinoma it is. Lymphomas were 4 per cent of total cases (4.0 in males and 4.6 in females); leukaemia was 3.3 per cent of total cases (3.9 in males and 3.2 in females); unspecified cancer was 2.6 per cent per cent of total cases; and soft tissue sarcomas, mesothelioma and kaposi sarcoma were responsible for the remaining 2 per cent. Joinpoint analysis of age-standardised incidence rates of adenocarcinoma for all cancer in males increased by 3.7 per cent per annum between 1972 and 1989 and then increased by 7.5 per cent per annum until 1994. Thereafter, there was decrease of 3.2 per cent until 2000 when there was a increase of 3.9 per cent per annum until 2007. Adenocarcinoma in females increased by 2.2 per cent per annum between 1972 and 1990 and then increased by 4.0 per cent per annum until 1994. Thereafter, no significant trend was noted until 2007.

Incidence rates of squamous cell carcinomas for all cancer in males increased by 3.9 per cent per annum between 1972 and 1982 and then decreased by 1.5 per cent per annum until 1997. Thereafter, the rates decreased by 2.5 per cent until 2007. Similarly, incidence rates of squamous cell carcinoma in females increased by 2.5 per cent per annum between 1972 and 1981 and then decreased by 0.6 per cent per annum until 1998. Thereafter, no significant trend was noted until 2001 when there was a decrease of 1.3 per cent per annum until 2007.

Incidence rates of unspecified carcinoma for all cancer in males decreased by 12.6 per cent per annum between 1972 and 1976 and then showed no significant trend until 1983. Thereafter, rates increased by 38.0 per cent per annum until 1986 when there was a decrease of 2.5 per cent per annum until 2007. Unspecified carcinoma of cancer in females decreased by 16.0 per cent per annum between 1972 and 1977 and then showed no significant trend until 1983. Thereafter, rates increased by 49.2 per cent per annum until 1986 when there was a decrease of 1.6 per cent per annum until 2007.

Some of the patterns in rates for all cancer indicate changes in coding practices or better determination of histopathology as a result of the mandatory notification of pathology reports to the NSW Central Cancer Registry. This would explain the reduction in rates of unspecified carcinoma after 1986.

Incidence rates of other specific carcinomas for all cancer in males increased by 6.8 per cent per annum between 1972 and 1984 and then decreased by 25.6 per cent per annum until 1987. Thereafter, no significant trend was noted until 1996 when there was a increase of 3.6 per cent per annum until 2007. Other specific carcinomas in females increased by 3.6 per cent per annum between 1972 and 1984 and then decreased by 26.5 per cent per annum until 1987. Thereafter, there was no significant trend until 1998, when there was an increase of 6.6 per cent per annum until 2007.

Incidence rates of lymphomas in males increased by 3.1 per cent per annum between 1972 and 1992 and then showed no significant trend until 2007. Lymphomas in females increased by 2.3 per cent per annum between 1972 and 1996 and then showed no significant trend until 2007.

Incidence rates for sarcomas showed no significant trend between 1972 and 1988. Thereafter, rates decreased by 1.1 per cent per annum until 2007. Sarcomas in females showed no significant trend between 1972 and 2007.

Figure 15
All cancer

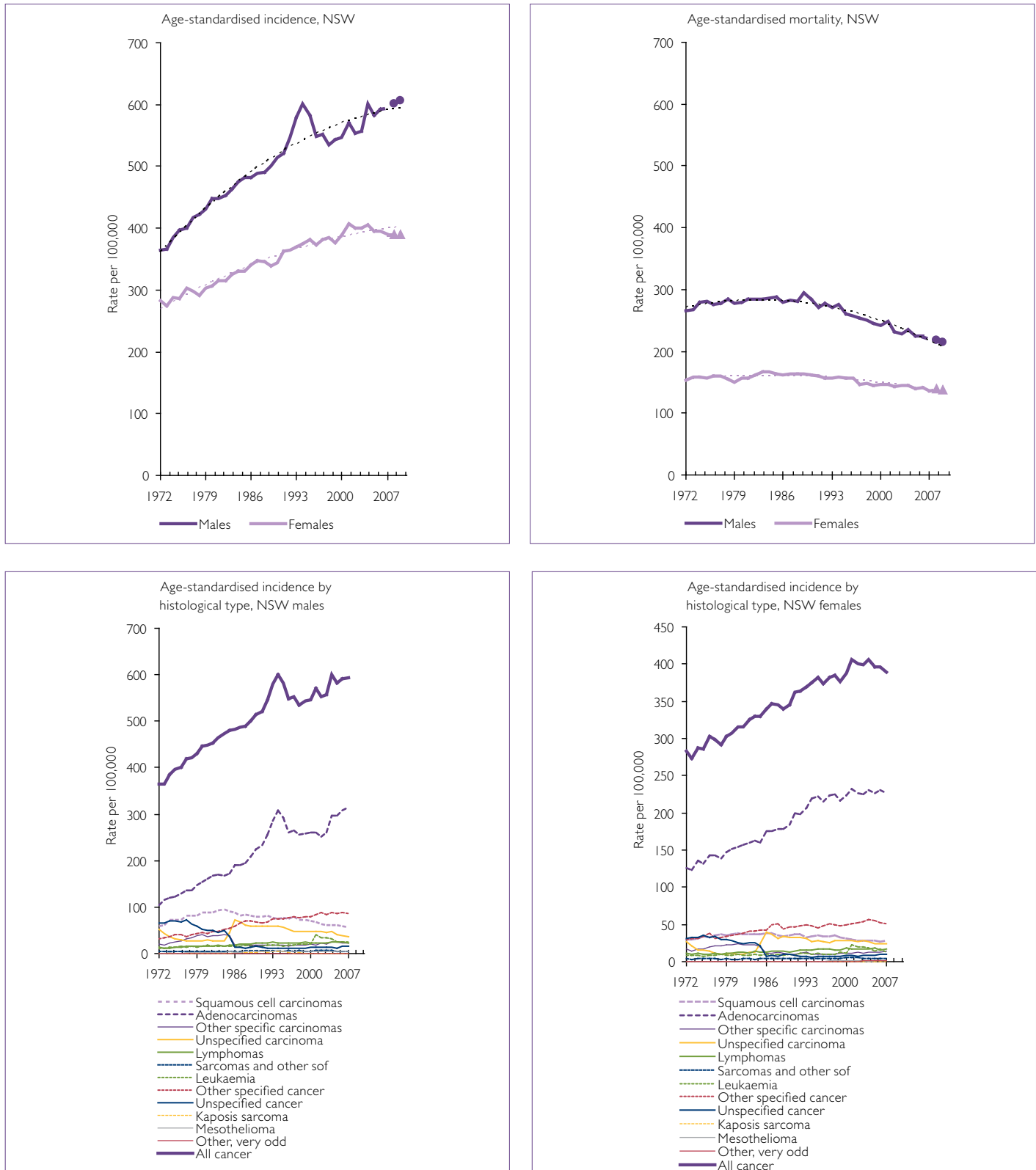
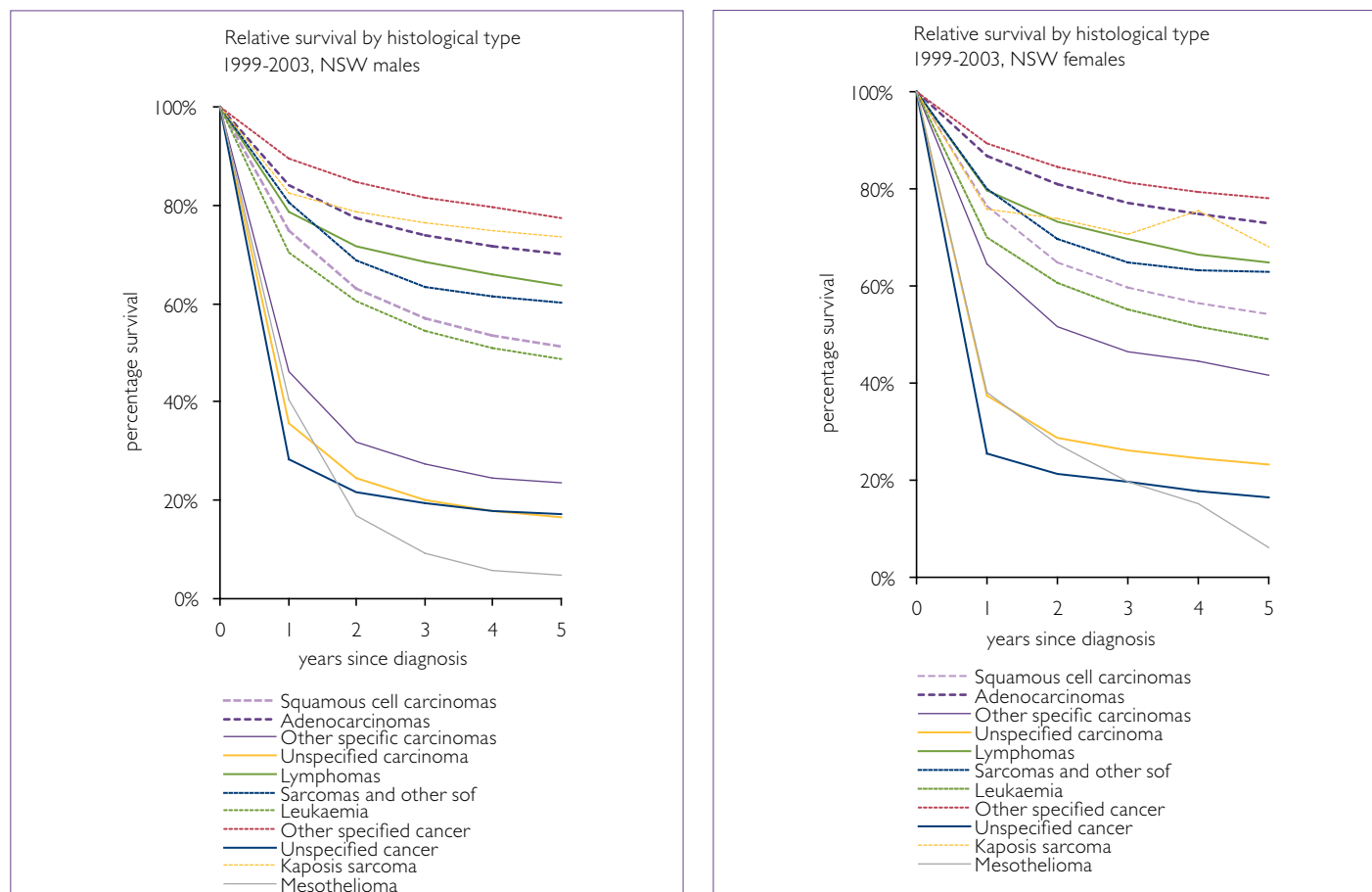


Figure 15 (cont'd)
All cancer



Incidence rates of leukaemia in males increased by 1.4 per cent per annum between 1972 and 1999 and then increased by 26.5 per cent per annum until 2002. Thereafter, rates decreased by 9.8 per cent per annum until 2007. Incidence rates of leukaemia in females increased by 1.0 per cent per annum between 1972 and 1998 and then increased by 20.4 per cent per annum until 2002. Thereafter, rates decreased by 9.5 per cent per annum until 2007.

Incidence rates of other specified cancer in males increased by 3.6 per cent per annum between 1972 and 1983 and then increased by 6.8 per cent per annum until 1988. Thereafter, rates increased by 1.5 per cent per annum until 2007. Other specified cancer in females increased by 2.9 per cent per annum between 1972 and 1988 and then increased by 0.9 per cent per annum until 2007.

Incidence rates of unspecified cancer in males decreased by 3.8 per cent per annum between 1972 and 1984 and then decreased by 34.7 per cent per annum until 1987. Thereafter, no significant trend was seen until 1997, when there was an increase of 3.0 per cent per annum until 2007. Unspecified cancer in females decreased by 2.7 per cent per annum between 1972 and 1984 and then decreased by 30.4 per cent per annum until 1987. Thereafter, rates decreased by 4.2 per cent until 1994 when there was an increase of 3.2 per cent per annum until 2007.

Survival by histological type

The five-year relative survival experienced from 1999 to 2003 in NSW was 60 per cent for males and 66 per cent for females diagnosed with cancer.

Survival has previously shown to increase with age at diagnosis and period of diagnosis and decrease by stage at diagnosis for all cancer sites combined.^{xx} The five-year relative survival from 1999 to 2003 by histological type of cancer for males was:

- 70.1 per cent for adenocarcinomas
- 51.4 per cent for squamous cell carcinomas
- 23.6 per cent for other specific carcinomas
- 16.5 per cent for unspecified carcinoma
- 63.6 per cent for lymphomas
- 60.3 per cent for sarcomas
- 48.6 per cent for leukaemia
- 77.5 per cent for other specified cancer
- 17.2 per cent for unspecified cancer
- 73.7 per cent for Kaposi's sarcoma
- 4.9 per cent for mesothelioma.

NSW survival rates were similar to Victorian survival rates^{xxi} for the same time period (where comparisons were possible). Five-year relative survival from adenocarcinoma was 70 per cent in Victoria and 70.1 per cent in NSW males and 73 in NSW females. Squamous cell carcinoma was 53 per cent in Victoria compared to 51.4 per cent in NSW males and 54 per cent in NSW females. Other specific carcinoma was 30 per cent in Victoria and 23.6 in NSW males and 41.7 in NSW females. Unspecified cancer with 14 per cent in Victoria and 16.5 per cent in NSW males and 23.2 per cent in females.

Sarcomas were 67 per cent in Victoria versus 60.3 in NSW males and 63 per cent in females. Kaposi's sarcoma was 87 in Victoria compared to 73.7 in NSW males and 68.2 per cent in NSW females. Mesothelioma was 5 per cent in Victorian males and females and NSW males and 6 per cent in NSW females.

Other specified cancer was 75 per cent in Victoria compared to 77.5 per cent in NSW males 78 per cent in females.

Risk factors for cancer

Risk factors vary by cancer type. By far the most common risk factor is tobacco, which impacts on a number of tobacco-related cancers including lung cancer; bladder; bowel, cervix, head and neck cancers, lip, pancreas, oesophagus, bowel and kidney cancer.

Melanoma is strongly affected by ultraviolet radiation exposure, particularly in childhood. Exposure to ionising radiation causes cancer of the brain, lung, leukaemia, multiple myeloma and thyroid.

Other risk factors include alcohol, diet and obesity; and reproductive factors such as number of children or age at first birth, which impact on both breast and ovarian cancer.

The main risk factors for each cancer type are outlined in this report.

xx. Tracey E, Baker D, Barraclough H, Chen W, Roder D, Jelfs P, Bishop J. Survival from Cancer in NSW: 1980 to 2003. Sydney: Cancer Institute NSW, August 2007.

xxi. English D, Farrugia H, Thursfield V, Chang P, Giles G Cancer Survival Victoria, 2007. Victorian Cancer Registry, Cancer Epidemiology Centre. Melbourne Victoria. April 2007.