Alcohol- and smoking-related cancers

Alcohol and smoking are risk factors for some cancers. In 1997, alcohol-related cancers accounted for 0.9% of all new cancers, while smoking-related cancers accounted for 13.1%. Smoking-related cancers also accounted for a large proportion of deaths from cancer in 1997 (20.3% of all cancer deaths). These data and those in Tables 24–25 are derived from a series of age- and sex-specific aetiological fractions developed by English et al. (1995) and the cancer incidence estimates for specific cancer sites for 1997. These fractions are based on an analysis of international and Australian studies and estimate the probability that a specific agent (alcohol or tobacco) causes a specific disease (cancer). The cancers thought to be directly attributable to smoking (excluding passive smoking) and alcohol are listed in Table 2.

Table 2: Cancer site and per cent of cancers attributable to alcohol and smoking

	Males (%)	Females (%)
Alcohol-related cancers		
Oropharynx	21	8
Oesophagus	14	6
Liver	18	12
Larynx	21	13
Female breast cancer	—	3
Smoking-related cancers		
Oropharynx	57	51
Oesophagus	54	46
Stomach	14	11
Anus	48	41
Pancreas	24	19
Larynx	73	66
Lung	84	77
Uterus	—	10
Cervix	—	19
Vulva	—	40
Penis	30	—
Bladder	43	36
Renal parenchyma	28	21
Renal pelvis	55	48

Source: English et al. 1995.

It is estimated that 688 new cases of cancer were directly attributable to hazardous and harmful alcohol consumption in 1997 at a rate of 3.5 per 100,000 population, as were 319 deaths at a rate of 1.6 per 100,000 population. While other cancers may be indirectly caused by alcohol consumption in combination with other risk factors, alcohol is believed to be the primary causative agent for differing proportions of specific cancers. The mechanism by which alcohol causes cancer has not been fully determined, but the major metabolite of ethanol has been shown to be carcinogenic in animal experiments (English et al. 1995). The lifetime risk of an alcohol-related cancer is 1 in 236 for males and 1 in 299 for females. Between 1992 and 1997, the incidence rate for alcohol-related cancers in males fell by an average of 2.1% per annum, while the rate in females increased by 2.2% per annum.

Smoking-related cancers account for 18.0% of all new cases of cancer in males and 7.2% of all new cases of cancer in females. This large difference is attributable to the higher rates of smoking among men than women in the past 30 years. Twenty-five years ago, smoking rates in men were almost double those in women. However, this is no longer the case, with the latest estimates indicating that 25% of men and 20% of women aged over 14 years currently smoke (AIHW 1999). Organs associated with the respiratory system are the ones most affected by cigarette smoke, probably as a result of the known carcinogens in cigarette smoke such as polycyclic aromatic hydrocarbons (Table 2). Epidemiological evidence indicates that other cancers, including cancer of the upper digestive tract, bladder, renal pelvis (kidneys) and pancreas are also associated with cigarette smoking (English et al. 1995).

Cigarette smoking is estimated to have directly caused 10,391 new cases of cancer (52.9 new cases per 100,000 population) and 6,909 deaths (35.0 per 100,000 population) in 1997. Between 1992 and 1997, the male incidence rate for smoking-related cancers fell by an average of 1.5% per year, while the rate for females rose by 0.6% per year, both probably a reflection of the changing lung cancer incidence rates (Figure 14). Over the same period, mortality rates fell by 1.9% per annum for males and rose by 0.7% per annum for females. These trends in incidence and mortality rates for smoking-related cancers are depicted in Figure 14.

To illustrate the improvement in the male mortality rate for smoking-related cancers, if the 1987 age-specific rates were applied to the 1997 male population there would be an additional 1,135 male deaths due to smoking in 1997. In contrast, the female mortality rate for smoking-related cancers has increased since 1987. There would be 199 fewer female deaths in 1997 if the 1987 rates were applied to the 1997 female population.

Cancer rates in the States and Territories 1993–1997

Cancer incidence and mortality are reported here for the combined period 1993–1997 for all States and Territories.

Cancer incidence is generally similar among States and Territories. However, the variation in the incidence of melanoma creates some differences in the overall incidence rates. An analysis of all cancers combined (excluding non-melanocytic skin cancers) showed that Queensland had the highest incidence among males (535.3 per 100,000 population), while the Northern Territory reported the lowest with 441.4 cases per 100,000 population. For females, Queensland reported the highest rate (361.5 per 100,000 population) and the Australian Capital Territory reported the lowest (328.5 per 100,000 population) (Figure 7, Table 8).

When the impact of melanoma was removed from the comparison, the order of States and Territories with the highest and lowest cancer incidence rate for males changed with Tasmania reporting the highest incidence rate for all cancers combined (excluding non-melanocytic skin cancers and melanoma) among males (493.3 per 100,000 population), and the Northern Territory reporting the lowest with 414.3 cases per 100,000 population. The remaining States and Territories reported the following rates for males: Queensland 470.0 per 100,000 population, South Australia 467.2, Victoria 456.9, Western Australia 453.7, the Australian Capital Territory 445.3 and New South Wales 440.8. For females, Tasmania reported the highest rate (318.8 per 100,000 population) and Western Australia reported the lowest (297.8 per 100,000 population). The remaining States and Territories reported the following rates for females: Queensland 315.0 per 100,000 population, Victoria 312.8, the

Northern Territory 309.9, South Australia 304.7, New South Wales 301.9 and the Australian Capital Territory 298.0.

The cancer mortality rates reported for males across the States and Territories range from 216.2 per 100,000 population in New South Wales to 249.8 per 100,000 population in the Australian Capital Territory (Table 8). For females, the mortality rates vary from 131.9 per 100,000 population in Queensland to 177.0 in the Northern Territory.

There is more variation among the States and Territories when selected cancer sites are examined. The cancer with the greatest variation between States and Territories is melanoma. Melanoma incidence rates in both males and females, highest in Queensland, are more than twice that of the lowest rates occurring in the Northern Territory (Figure 7, Table 13), a situation that has prevailed since the early 1980s. Melanoma risk is generally highest in the northern areas and lower in the more southerly areas, showing a correlation to ultra-violet radiation exposure (Jelfs et al. 1994). The variation among the State and Territory mortality rates is smaller than the variation in incidence rates (Table 13).

Lung cancer incidence rates are highest in the Northern Territory (for males 90.3 cases per 100,000 population, for females 41.3) (Table 12). The lowest lung cancer incidence rates are reported for males in the Australian Capital Territory (41.4 per 100,000 population) and for females in South Australia (21.7).

State and Territory variations in smoking-related cancers generally reflect those observed for lung cancer (Table 27). The Northern Territory reported the highest incidence rates for males and females (114.8 and 40.7 per 100,000 population respectively). The Australian Capital Territory reported the lowest smoking-related cancer incidence rates for males (63.9 per 100,000 population) and South Australia had the lowest rate for females (22.2). Death rates from smoking-related cancers were highest in the Northern Territory for both males and females.

These patterns of incidence probably reflect smoking behaviour approximately 10–20 years ago, due to the time lag between exposure to carcinogens in the tobacco smoke and the diagnosis of cancer. Differentials in smoking rates between the States and Territories reported in the 1995 National Health Survey (ABS 1997a) are likely to affect smoking-related cancer incidence rates in the future. Tasmania (57.3%) reported the highest proportion of current and ex-smokers followed by the Northern Territory with 56.0%. The lowest smoking and ex-smoking rates were found in New South Wales at 49.2%. In the other States and the Australian Capital Territory the proportions of smokers and ex-smokers ranged from 50% to 53%.

Western Australia, Victoria, the Australian Capital Territory and New South Wales reported the highest incidence rates for breast cancer in females (ranging from 99.8 to 98.3 per 100,000 population), while the Northern Territory reported the lowest incidence rate (69.0 per 100,000 population) (Table 14). The Australian Capital Territory and Tasmania reported high rates of prostate cancer (161.6 and 156.3 per 100,000 population respectively), while significantly lower rates were reported in the Northern Territory (87.7 per 100,000 population) (Table 18), a rate influenced by the low Indigenous population incidence rates (d'Espaignet et al. 1996). These interstate variations in prostate cancer incidence might also be explained by differences in the time and rate of uptake of prostate-specific antigen (PSA) testing in the States and Territories (Smith et al. 1998; Threlfall et al. 1998).

There were differences in cervical cancer incidence among the States and Territories. This probably reflects in part the relative impact of the screening programs in each jurisdiction. Most of the large States show consistent rates of approximately 10–11 new cases per 100,000 population; however, South Australia shows a substantially lower rate of 7.4 per 100,000

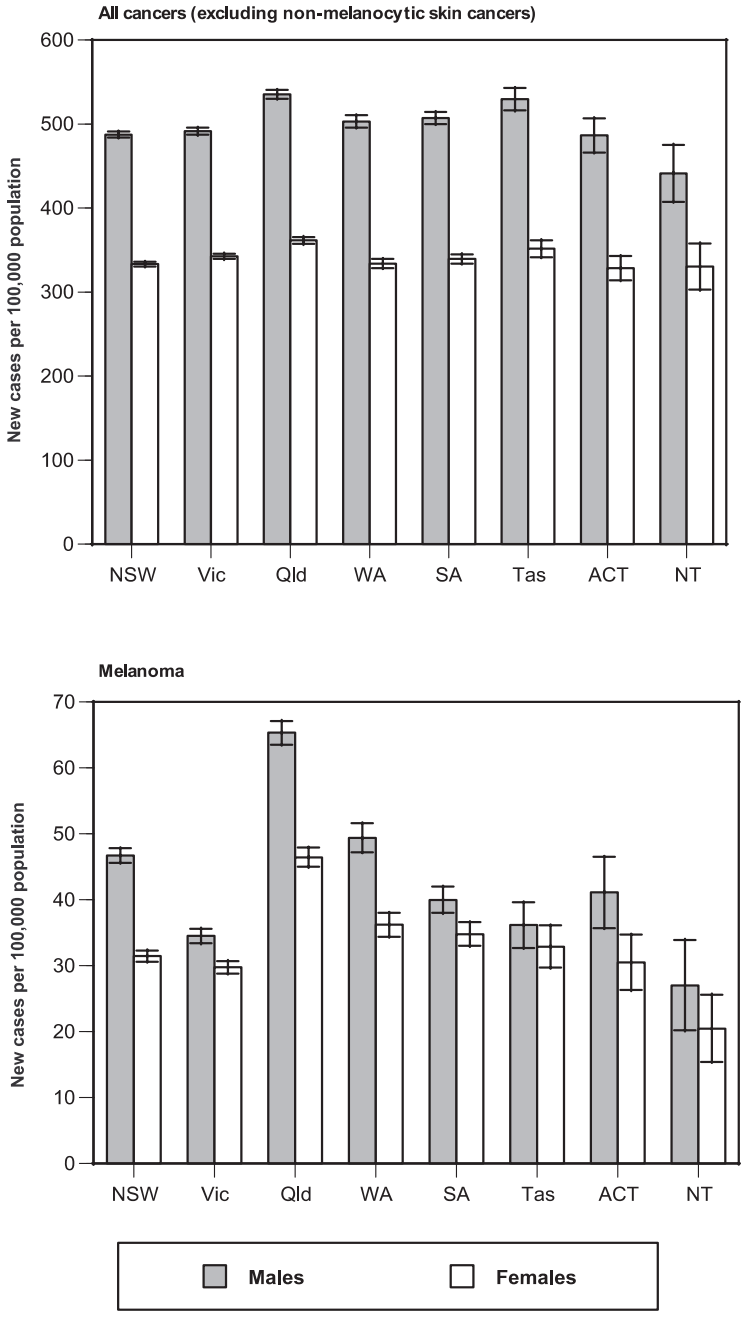
population. The Northern Territory, while having relatively small numbers of new cases, has a very high incidence rate of 21.2 per 100,000 population. A major contributor to this incidence rate is the high rate of cervical cancer amongst the Indigenous population, which d'Espaignet et al. (1996) indicated was up to three times the non-Indigenous population rate. This situation is also reflected in a high mortality rate (9.1 deaths per 100,000 population). This high mortality rate may be an indicator of late stage detection of these cancers.

While 1997 incidence data are the latest national data, some States and Territories have released data for 1998—the Northern Territory—and data for 1999—Western Australia, South Australia and Tasmania. These four jurisdictions account for approximately 20% of new cancer cases. A combination of the 1998 and 1999 incidence rates for these jurisdictions, compared with their 1997 combined rates for the most common cancers, shows some changes which may be early indicators for the larger states of New South Wales, Victoria and Queensland. The incidence rates for all cancers combined remained fairly steady. Melanoma rates increased and lung cancer rates declined for both sexes. Prostate cancer rates registered a small fall while breast cancer rates rose marginally. Most other cancers showed only minor change.

Differences in State and Territory cancer incidence rates may be explained by variations in underlying cancer risk, the availability and utilisation of diagnostic procedures, reporting and coding inconsistencies, and normal incidence rate fluctuations. A case in point is bladder cancer (Table 20), where State and Territory comparisons vary by as much as 100%. This is largely due to differences in local coding practices, particularly in regard to the inclusion or exclusion of tumours of uncertain behaviour. The AACR plans to address this issue in the near future by standardising coding practices.

Care should be taken when interpreting incidence rates, especially for less common cancers and for States and Territories with small populations. To reduce the problems of statistical variation due to a small number of cases, the numbers and rates presented for the States and Territories in Tables 8 to 27 in this publication are annual averages of the 5-year period 1993–1997. For annual sex- and cancer-specific data, or data cross-classified by other variables (e.g. age, geographic area), the State and Territory cancer registries should be contacted directly (see pages 78 and 79 for contact details).

All cancers and melanoma incidence rates by sex and by State and Territory



Source: Cancer in Australia 1997, AIHW & AACR 2000.

Figure 7: Age-standardised incidence rates (95% confidence intervals) for all cancers (excluding non-melanocytic skin cancers) and for melanoma by State and Territory, 1993–1997