# Cancer in Australia

## An update for GPs

**Brian McAvoy,** MD, FRACGP, FRNZCGP, FRCGP, FRCP, FAChAM, is Deputy Director, National Cancer Control Initiative, Melbourne, Victoria. brian.mcavoy@ncci.org.au

**Mark Elwood,** MD, DSc, FRCPC, FAFPHM, is Director, National Cancer Control Initiative, Melbourne, Victoria.

**Margaret Staples,** DipAppSc, BBSc, MSc, is Senior Project Officer, National Cancer Control Initiative, Melbourne, Victoria.

**BACKGROUND**

General practitioners have a critical role to play in cancer control in Australia. Their work spans the full spectrum of cancer care – prevention, detection, treatment and palliation, and includes psychosocial support of patients and carers. The general practitioner practises clinical medicine in a very different setting and context from those of the hospital specialist. Problems are often undifferentiated, and illness is more common than disease.

**OBJECTIVE**

This article provides an update on cancer, covering incidence, prevalence, mortality, age distribution, survival, costs, trends and screening.

**DISCUSSION**

From a primary care perspective, patients with a new diagnosis of cancer are infrequent, but providing ongoing care for patients with an established diagnosis of cancer, and their carers, poses substantial issues. The average practitioner will encounter about four new patients each year who will be diagnosed with a potentially fatal cancer, and have about 16 patients at any one time with a diagnosed cancer under their care.[1]

### How common is cancer?

Cancer is the leading cause of death among Australians, accounting for 28% of deaths.[2] More than half the population will develop at least one nonmelanoma skin cancer (NMSC), and one in three men and one in four women will develop a major cancer before they reach the age of 75 years.

We refer to the incidence of cancer (the number of newly diagnosed cases), the prevalence (the number of people alive who have had a diagnosis of cancer), the mortality (the number of deaths attributed to cancer), and the survival (the proportion of cancer patients who are alive at a certain time after diagnosis, often 5 years). The data are available in the reports on Cancer in Australia (most recently for 2000), which are produced by the Australian Institute of Health and Welfare (AIHW) and the Australian Association of Cancer Registries (AACR), collating data from the cancer registries and mortality data.[2,3]

*Table 1* shows the number of new cancers and deaths in Australia, and the rate per 100 000 men or women. The commonest cancers, by far, are NMSCs. These are so common they are not routinely reported by cancer registries. The data on NMSCs are from a national household survey recently published by the National Cancer Control Initiative[4] which estimated that in 2002, of 374 000 people treated for skin cancer, 68% were for basal cell cancer (BCCs) and 32% for squamous cell cancer (SCCs). Of these, 54% of those with BCCs and 65% of those with SCCs were treated in a primary care setting.

As well as these 374 000 skin cancers, there were 85 231 new cancer diagnoses and 35 466 deaths due to cancer in Australia in 2000 (the most recent year with data available). Incidences per 100 000 is usually given for these figures, which may disguise the fact that although cancers account for 28% of all deaths, they are not very common in primary care. In a population of 10 000 (equivalent to a small town or a large group practice), in 1 year there will be 195 skin cancers and 45 'serious' cancers, but only six new breast cancers and four new lung cancers.

The prevalence of cancer is harder to estimate. A Western Australian study estimated that for each person newly diagnosed in a year, there are about eight people alive after a diagnosis of cancer (excluding NMSC), and

at least two under active treatment for cancer who would likely die from their disease.[5] In statistical terms, in 2001 there were an estimated 267 000 persons in Australia with malignant cancer living in private households, about three times the annual incidence.[6]

The risk of cancer increases rapidly with age. The chance of an average man being diagnosed with cancer in the next 10 years rises from less than 1% for those aged less than 30 years, to over 30% for those aged over 70 years (*Figure 1*). The risk of cancer in women is slightly higher than in men to the age of 50 years, but then increases more slowly. The 10 year risk in women is 2.2% for those aged 35 years, and 17% for those aged 75 years and over. In 2000, the median age at diagnosis was 69 years for men and 65 years for women.

## The commonest cancers

As shown in *Figure 2*, the most common cancers in Australia (excluding NMSCs) are prostate, colorectal, lung and melanoma in men; and breast, colorectal, melanoma and lung in women. For both sexes combined, colorectal cancer is the most common. The league table of cancers as a cause of death is different because survival rates vary; the cancers most commonly causing death are lung, colorectal, prostate, and breast cancers.

Total cancer incidence is almost 40% higher in men than in women of the same age, and cancer mortality is nearly 70% higher. Men have a higher incidence rate for most shared cancer sites, including the bad prognosis sites such as the lung. Exceptions where women have higher rates are, apart from breast cancer, relatively rare sites such as the thyroid, gallbladder, anus, connective and soft tissue, and meninges and other central nervous system sites.

Cancer has a different spectrum in children, with leukaemia and brain cancer predominating. In young adults melanoma and breast cancer are important, and thyroid cancer and testicular cancer are relatively

**Table 1. Numbers of new cases and deaths in one year in Australia and rates per 100 000 persons**

| | Incidence (newly diagnosed patients) | | | | | | Deaths attributed to cancer | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Men | Women | Both sexes | Rate 100 000 men | Rate 100 000 women | Rate 100 000 persons | Men | Women | Both sexes | Rate 100 000 men | Rate 100 000 women | Rate 100 000 persons |
| Total treated NMSCs (2002) comprising: | 215 000 | 159 000 | 374 000 | 2262 | 1648 | 1953 | | | | | | |
| BCCs | 144 000 | 112 000 | 256 000 | 1515 | 1161 | 1337 | | | | | | |
| SCCs | 71 000 | 47 000 | 118 000 | 747 | 487 | 616 | | | | | | |
| All registrable cancers (except NMSC) | 45 935 | 39 296 | 85 231 | 483 | 407 | 445 | 20 038 | 15 428 | 35 466 | 211 | 160 | 185 |
| Colorectal | 6863 | 5542 | 12 405 | 72 | 57 | 65 | 2569 | 2149 | 4718 | 27 | 22 | 25 |
| Breast | 86 | 11 314 | 11 400 | 1 | 117 | 60 | 21 | 2521 | 2542 | 0 | 26 | 13 |
| Prostate | 10 512 | NA | 10 512 | 111 | NA | 55 | 2665 | NA | 2665 | 28 | NA | 14 |
| Melanoma (skin) | 4770 | 3761 | 8531 | 50 | 39 | 45 | 617 | 354 | 971 | 6 | 4 | 5 |
| Lung | 5278 | 2782 | 8060 | 56 | 29 | 42 | 4594 | 2317 | 6911 | 48 | 24 | 36 |
| Non-Hodgkin lymphoma | 1864 | 1593 | 3457 | 20 | 17 | 18 | 857 | 734 | 1591 | 9 | 8 | 8 |
| Unknown primary site | 1607 | 1558 | 3165 | 17 | 16 | 17 | 1202 | 1217 | 2419 | 13 | 13 | 13 |
| Bladder | 2139 | 747 | 2886 | 23 | 8 | 15 | 570 | 249 | 819 | 6 | 3 | 4 |
| Kidney, ureter and urethra | 1470 | 935 | 2405 | 15 | 10 | 13 | 500 | 334 | 834 | 5 | 3 | 4 |
| Stomach | 1267 | 713 | 1980 | 13 | 7 | 10 | 763 | 426 | 1189 | 8 | 4 | 6 |
| Pancreas | 912 | 896 | 1808 | 10 | 9 | 9 | 872 | 876 | 1748 | 9 | 9 | 9 |
| Corpus uteri | NA | 1564 | 1564 | NA | 16 | 8 | NA | 261 | 261 | NA | 3 | 1 |
| Ovary | NA | 1201 | 1201 | NA | 12 | 6 | NA | 780 | 780 | NA | 8 | 4 |
| All other sites | 9167 | 6690 | 15 857 | 96 | 69 | 83 | 4808 | 3210 | 8018 | 51 | 33 | 42 |
| Population | 9 505 331 | 9 648 049 | 19 153 380 | | | | | | | | | |

NA: not applicable
Rates shown are crude rates. Source: AIHW, 2003[2]

common. In middle aged and over adults, colorectal, breast, prostate, lung cancer, and melanoma predominate.

## Survival

The survival of cancer patients is often summarised by survival at 5 years after diagnosis, expressed as a 'relative survival rate' that includes an adjustment for the expected mortality rate of someone of that age from general causes. As shown in *Figure 3*, survival rates of major cancers range from over 90% for testicular cancer, melanoma, and thyroid cancer, to less than 15% for lung and pancreatic cancer. The 5 year survival rate for all cancer (excluding NMSC) for patients diagnosed in 1992–1996 was 63% for women and 57% for men, but the differences between men and women in survival are small within cancer sites. A recent study from New South Wales has shown reduced survival for all cancers in patients living in more remote areas.[7]

Cancer survival has generally been improving; the comparable figures for all cancer for patients diagnosed in 1982–1986 were 55% and 44% respectively, and most cancer sites have shown improvements.

International comparisons of cancer survival may be complicated by differences in definitions and coding, but the available comparisons show that patients in Australia do well compared to patients elsewhere in the world. For the most recent period (patients diagnosed in 1992–1997), the 5 year survival rates in Australia were similar to those in the United States; both countries generally had higher survival rates than European countries.[3]

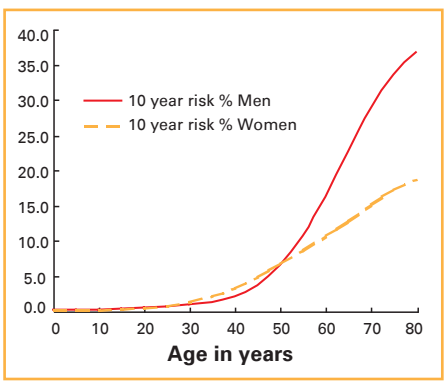



**Figure 1. Risk of being diagnosed with cancer (excluding NMSC) in the next 10 years (%) assuming survival over 10 year period**

## Cancer costs

The most recent cost figures for cancer are 10 years old (1993–1994). At that time, cancer cost almost $2 billion per year in direct health system costs, of which more than 80% were treatment costs.[8] This formed 6% of total health expenditure. The cancer that contributed most to direct health system costs was NMSC, with estimated costs of $232 million in 1993–1994. The next most costly cancers were colorectal ($205 million), breast ($184 million), leukaemia ($111 million) and lung cancer ($107 million). Unlike most other disease groups, hospital inpatient expenditure accounted for the majority (over 70%) of the estimated health system costs of cancer in 1993–1994. Medical service costs outside hospitals accounted for a further 14%, followed by research (4%), public health programs (4%) and pharmaceutical costs (3%). This distribution has probably shifted away from in-hospital costs in recent years.

## Trends and effects of screening

From 1990–2000 there was a 36% increase in the annual number of new cases of cancer (excluding NMSC). Of this increase, only an 8% increase was due to a true change in cancer incidence, with the remainder being equally attributable to population growth and the aging of the population. Incidence rates for all cancers, adjusted for age, peaked around 1994–1995. The incidence and death rates for all cancers (excluding NMSC) in men have declined by about 10% over the 5 years until 2000. For women, total incidence rates have been fairly steady from 1995–2000, but the mortality rate has fallen by about 10%.

The rate of treated NMSCs, estimated from surveys, continues to increase. Basal cell carcinoma rates have increased by 22% since 1990, with the rate of increase being similar in both sexes. Squamous cell carcinoma rates have increased by 53% since 1990 with the rate of increase being higher in women (75%) compared to men (46%). However, this may be partially due to earlier intervention or more treatment rather than true trends in incidence.

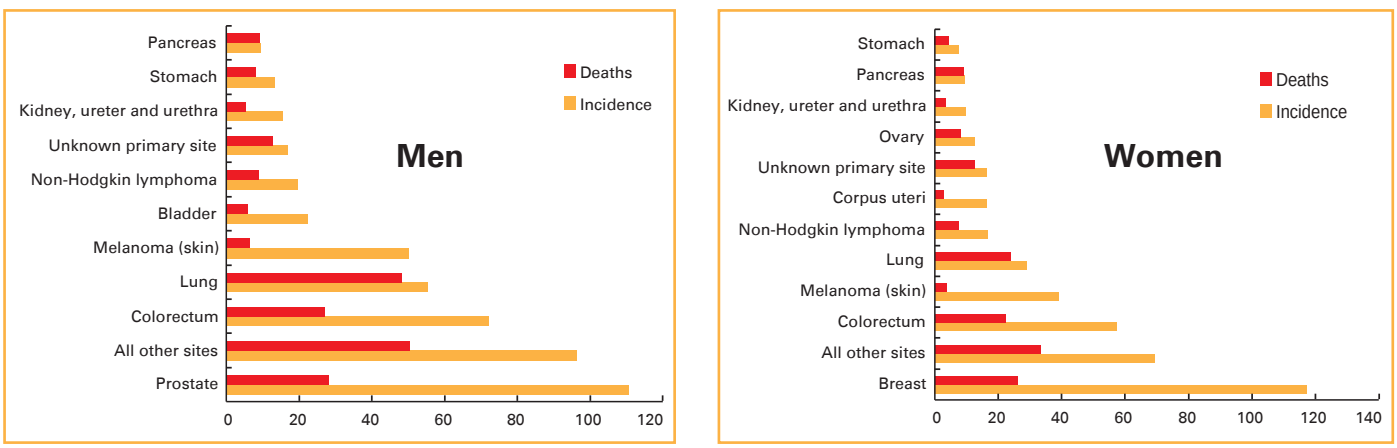



**Figure 2. Annual numbers of new cases and deaths in men and women, per 100 000 men or women, Australia 2000. Men, total incidence 483, plus skin cancers 2262; total deaths 211 per 100 000 per year. Women, total incidence 407, plus skin cancers 1648; total deaths 160 per 100 000 per year**

Trends vary greatly between types of cancer (*Figure 4*). For all cancers combined, morbidity rates for both men and women fell by about 10% over 5 years until 2000. A recent 10% decrease is dominated by prostate cancer, which is falling in incidence after the sharp rise in diagnoses produced by the introduction of prostate specific antigen (PSA) testing (76% rise in the incidence from 1990–1995). Prostate cancer mortality had been slowly declining before the widespread use of PSA testing. The incidence rate for all cancers in women has shown no recent change.

Some sites show increasing incidence but decreasing mortality such as testis cancer in men, breast, uterus and kidney cancers in women, and in both men and women, melanoma, bladder and colorectal cancers. Lung cancer incidence and mortality is falling in men, as the epidemic of smoking induced cancers comes past its peak; but the female incidence and death rates are rising following the more recent smoking increases in women. In both sexes, stomach cancer incidence continues a longstanding downward trend, while non-Hodgkin lymphoma shows increasing incidence and mortality.

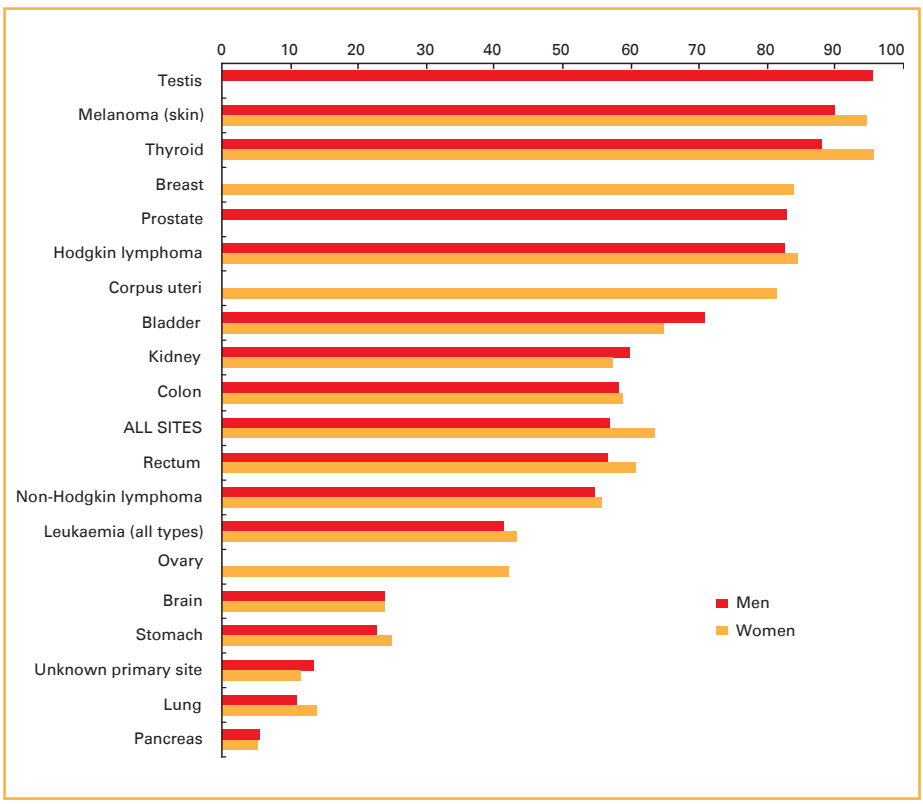
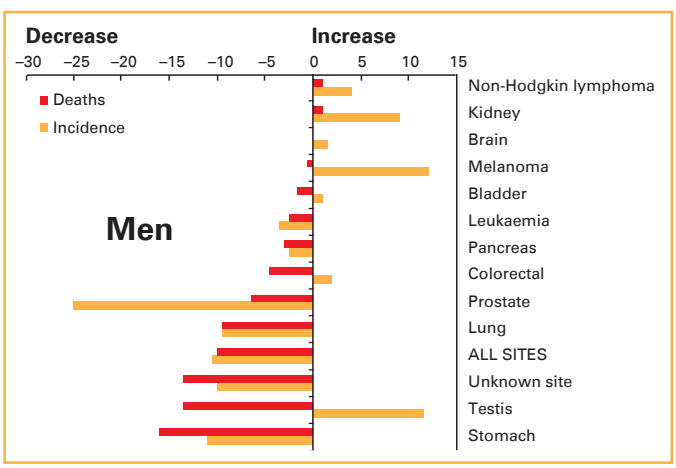



**Figure 3. Proportion of patients alive 5 years after diagnosis adjusted for expected mortality from other causes (5 year relative survival) by type of cancer (%)**

## Screening programs

There are national population screening programs for breast and cervical cancer. Breast cancer incidence has risen, but mortality has fallen. The proportion of women in the target age group (50–69 years) who were screened under the BreastScreen Australia program in a 2 year period rose slightly from 52% in 1996–1997, to 56% in the period 1999–2000; these data do not include screening outside the program.[2] Some of the increase in breast cancer incidence is likely to be due to screening. The decrease in mortality may be due both to screening and improved treatment.

Incidence and mortality of invasive cancer of the cervix has fallen greatly in recent years. This is mainly due to the detection and treatment of precancerous abnormalities and early cancers by Pap screening programs, thereby preventing the onset of cancer in many cases and allowing early treatment for others. The proportion of women in the target age group who were screened under the National Cervical Cancer Screening Program over a 2 year period was 64.5% in



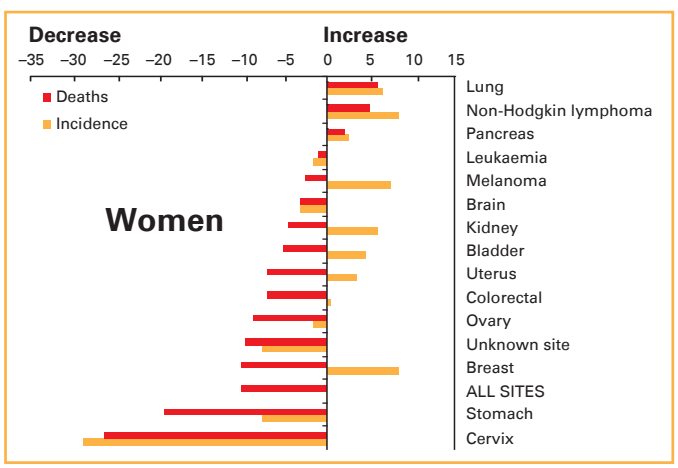




**Figure 4. Percentage change in mortality and incidence rates over 5 years 1995–2000 by cancer site, arranged in order of change in mortality rate**

1997–1998, and 63.3% in 1999–2000. The slight decline may be due to changes in measurement, reduced media campaigning, or a reduction in encouraging younger women to attend screening.

For both screening programs, the lowest rates for screening are among women who are non-English speaking, not in the labour force, or of low socioeconomic status. Screening is done more frequently than the recommended interval of 2 years; more than 20% of women aged 30–59 years reported having an annual Pap test. Of women aged 50–59 years, 20% reported having an annual mammogram, as did 16% of women aged 60–69 years.

A pilot program to test the feasibility, acceptability and cost effectiveness of bowel cancer screening, using one of two different immunochemical tests for occult blood in the stools of men and women aged between 55 and 74 years, began in three areas in 2002. Interim results in April 2004[9] show an uptake of about 45%, which is reasonable considering no general media publicity could be used. The positivity rates have been fairly high at 14.3% for men and 10.9% for women using the 'Inform' test, and 10.3% and 7.3% respectively using the 'Bayer Detect' test. In a period when 15 250 people were tested, 2023 consulted their GP about screening, 42% because of a positive test and many others because of symptoms or a strong family history of colorectal cancer.

Population screening for prostate cancer by PSA testing is not recommended by the government, cancer councils, the Urological Society of Australasia or The Royal Australian College of General Practitioners, as objective evidence of its effectiveness from randomised trials or other large studies is lacking.[10,11] Randomised trials are in progress in North America and Europe.

Despite this, the use of PSA testing in men aged 50–70 years is quite high.[12] General practitioners using PSA testing should be aware that around 30% of men with one test showing an elevated PSA will have a normal level if retested a few weeks later.[13]

## Summary of important points

- Overall, from 1995–2000 cancer mortality rates were decreasing in both men and women; cancer incidence fell in men and was stable in women.
- From 1990–2000, there was a 36% increase in the numbers of new cases of cancer. Three quarters of this was due to population growth and population aging.
- The commonest cancers after NMSCs are colorectal, breast, prostate, melanoma and lung cancer.
- The risk of developing cancer increases sharply with age.
- The overall survival rate at 5 years after diagnosis from cancer is about 60%, and is increasing.
- The direct health care costs of cancer were almost $2 billion per year in 1993–1994; forming 6% of total health care expenditure.
- General population screening of women aged 50–69 years for breast cancer, and aged 20–69 years for cervical cancer, is recommended. Pilot studies of screening for colorectal cancer are underway. Screening for other cancers including prostate cancer, is not recommended for the general population.

Conflict of interest: none declared.

## References


1. National Cancer Control Initiative. The primary care perspective on cancer: an introductory discussion. Melbourne: National Cancer Control Initiative, 2003.
2. Australian Institute of Health and Welfare, Australasian Association of Cancer Registries. Cancer in Australia 2000. AIHW cat. no. CAN 18. Canberra: AIHW (Cancer Series no. 23), 2003.
3. Australian Institute of Health and Welfare, Australasian Association of Cancer Registries. Cancer Survival in Australia, 2001. Part 1: National summary statistics. AIHW cat. no. CAN 13. Canberra: Australian Institute of Health and Welfare, 2001.
4. National Cancer Control Initiative. The 2002 national nonmelanoma skin cancer survey. Melbourne: National Cancer Control Initiative, 2003.
5. Brameld KJ, Holman CDJ, Threlfall TJ, Lawrence DM, de Klerk NH. Increasing 'active prevalence' of cancer in Western Australia and its implications for health services. Aust NZ J Public Health 2002;26:164–9.
6. Australian Bureau of Statistics. National Health Survey. Summary of results 2001. 4364.0. Canberra: Australian Bureau of Statistics, 2002.
7. Jong KE, Smith DP, Yu XQ, O'Connell DL, Goldstein D, Armstrong BK. Remoteness of residence and survival from cancer in New South Wales. Med J Aust 2004;180:618–22.
8. Mathers C, Penm R, Sanson-Fisher R, Campbell E. Health system costs of cancer in Australia 1993–94. Canberra: AIHW and the National Cancer Control Initiative, 1998.
9. Bowel Cancer Screening Pilot Program. Progress report April 2004.
10. Harris R, Lohr KN. Screening for prostate cancer: an update of the evidence for the US Preventive Services Task Force. Ann Intern Med 2002;137:917–29.
11. Frankel S, Smith GD, Donovan J, Neal D. Screening for prostate cancer. Lancet 2003;361:1122–8.
12. Smith D, Armstrong B, Saunders R. Patterns of prostate specific antigen testing in Australia in 1992 to 1996. An examination of Medicare data. Sydney: NSW Cancer Council, 1998.
13. Eastham JA, Riedel E, Scardino PT, et al. Variation of serum prostate specific antigen levels: an evaluation of year-to-year fluctuations. JAMA 2003;289:2695–700.


AFP

**Correspondence**
Email: afp@racgp.org.au