5 Other sources of cancer data

Cancer mortality—multiple causes of death

The mortality data reported in the summary tables in this report relate to deaths where cancer was recorded as the underlying cause of death. However, a diagnosis of cancer can raise a person's risk of death from a number of associated causes and these deaths may not be coded as having cancer as their underlying cause. Since 1997, national deaths data in Australia have been compiled with multiple causes of deaths. Multiple causes of death include all causes and conditions recorded on the death certificate (that is, both underlying and associated). The following table lists the National Health Priority Area cancers and shows the number of underlying and associated causes appearing on death certificates for deaths registered in 1999. For example, in Australia in 1999 there were 35,053 deaths where the underlying cause was malignant cancer and 11,714 additional deaths where cancer was the associated cause reported on the death certificate.

Table 3: Number of persons dying with cancer from another cause of death, Australia, 1999 (year of registration)

Cancer	Underlying cause	Additional persons who died with this cancer	Total
All malignant cancers (C00–C97)	35,053	11,714	46,767
Colorectal cancer (C18–C21)	4,576	556	5,132
Lung (C33–C34)	6,803	466	7,269
Melanoma (C43)	990	131	1,121
Non-melanocytic skin cancer (C44)	381	152	533
Breast (C50)	2,527	504	3,031
Cervix (C53)	220	48	268
Prostate cancer (C61)	2,499	1,150	3,649
Non-Hodgkin's lymphoma (C82–C85, C96)	1,496	259	1,755

Sources: ABS 2000b; AIHW Mortality Database.

Survival following cancer diagnosis

Survival after a diagnosis of cancer is an important measure in assessing the broad impacts of prevention, of early detection methods such as screening, and of treatment. Relative survival is the method commonly used by population-based cancer registries to measure and assess survival. It is the ratio between what actually happened to a group of people with cancer and what would normally have occurred to them in the absence of cancer. This discussion will focus on the 5-year relative survival proportion. This is the relative survival over the first 5-years following a diagnosis of cancer. A relative survival of 100% indicates that the disease has made no difference to survival of the group over this period. A survival rate of less than 100% indicates that fewer members of the group survived for 5-years than would have been expected for similar people in the general population.

The average 5-year relative survival proportion for all registrable cancers diagnosed in Australia between 1992 and 1997 was 56.8% for males and 63.4% for females (Tables 4 and 5).

Table 4: Five-year relative survival ratios for all registrable cancers and selected individual cancer sites, diagnosis period, males, Australia

	Diagnosis period			
Cancer site	**1982–1986**	**1987–1991**	**1992–1997**	
Males		**(Per cent)**		
Testis	91.1	95.2	95.4	*
Melanoma	83.0	87.2	90.0	*
Thyroid	81.0	82.6	87.9	
Prostate	59.3	64.3	82.7	*
Hodgkin's lymphoma	74.1	79.1	82.6	*
Bladder	71.2	71.6	70.8	
Kidney	50.8	53.7	59.9	*
Colon	50.2	54.7	58.3	*
Rectum	48.7	51.2	56.6	*
Non-Hodgkin's lymphoma	49.6	51.1	54.6	*
Leukaemia	39.4	43.3	41.2	
Brain	24.8	24.3	23.8	
Stomach	19.2	21.6	22.6	*
Unknown primary	11.7	13.0	13.4	
Lung	9.3	10.7	11.0	*
Pancreas	4.2	4.4	5.4	
All registrable cancers	**43.8**	**48.1**	**56.8**	*

* Change between 1982–1986 and 1992–1997 is statistically significant at the 95% level.

Source: AIHW & AACR 2001.

The cancers with the highest relative survival in males were cancer of the testis (95.4%) and melanoma (90.0%) and in females were cancer of the thyroid (95.6%) and melanoma (94.6%). Cancers with the lowest relative survival in males were cancer of the pancreas (5.4%), and

cancer of the lung (11.0%) and in females were cancer of the pancreas (5.2%) and cancers of unknown primary site (11.5%).

Table 5: Five-year relative survival proportions for all registrable cancers and selected individual cancer sites and diagnosis period, females, Australia

	Diagnosis period		
Cancer site	**1982–1986**	**1987–1991**	**1992–1997**
Females		**(Per cent)**	
Thyroid	87.8	91.9	95.6 *
Melanoma	90.9	93.5	94.6 *
Hodgkin's lymphoma	73.8	79.9	84.4 *
Breast	72.3	77.8	84.0 *
Uterus	76.1	78.5	81.4 *
Cervix	69.6	72.0	74.6 *
Bladder	67.2	65.2	64.7
Rectum	52.3	56.0	60.6 *
Colon	51.3	54.7	58.7 *
Kidney	49.4	52.7	57.5 *
Non-Hodgkin's lymphoma	49.9	54.6	55.8 *
Leukaemia	39.4	44.2	43.2 *
Ovary	34.4	37.7	42.0 *
Stomach	21.1	21.8	24.8 *
Brain	24.1	25.3	23.8
Lung	11.8	11.9	14.0 *
Unknown primary	10.4	10.9	11.5
Pancreas	4.1	5.4	5.2
All registrable cancers	**55.3**	**59.1**	**63.4 ***

* Change between 1982–1986 and 1992–1997 is statistically significant at the 95% level.

Source: AIHW & AACR 2001.

Five-year relative survival for all registrable cancers increased between 1982–1986 and 1992–1997 on average from 43.8% to 56.8% for males and from 55.3% to 63.4% for females. Most individual cancer sites showed an increase in relative survival over this period. The largest increases for males were in cancer of the prostate (59.3% to 82.7%) and cancer of the kidney (50.8% to 59.9%) and for females were in cancer of the breast (72.3% to 84.0%) and Hodgkin's lymphoma (73.8% to 84.4%). Cancers of the brain and bladder showed small decreases in relative survival over this period for both males and females, but these decreases were not statistically significant.

For registrable cancers diagnosed in males during the period 1992–1997, relative survival in capital cities, other metropolitan areas and large rural centres was close to 57.5%. This was significantly above the proportions in other areas, which ranged from 55.2% for small rural centres to 51.9% for 'other remote' areas (Table 6).

There were no statistically significant differences in relative survival for females between metropolitan, rural and remote areas. Five-year relative survival was highest in large rural centres (64.2%) and lowest in 'other remote' areas (61.9%).

Table 6: All cancers 5-year relative survival proportions, geographic location and sex, Australia, 1992–1997

Location	Males	Females
	(Per cent)	
Capital cities	57.5	63.6
Other metropolitan	57.4	62.6
Large rural centres	57.6	64.2
Small rural centres	55.2	63.0
Other rural areas	54.7	62.2
Remote centres	52.7	63.0
Other remote areas	51.9	61.9

Source: AIHW & AACR 2001.

Better off Australians tend to have better cancer survival. Five-year relative survival for both males and females, according to their socioeconomic status as measured by the ABS Index of Relative Socioeconomic Disadvantage, increased from the lowest quintile (most disadvantaged) through to the highest (least disadvantaged). For males diagnosed during the period 1992–1997, relative survival was 51.9% for persons resident in the most disadvantaged areas of Australia, and 61.4% for residents of the most advantaged areas. For females, there was a lesser disparity, with a relative survival of 61.9% in the bottom quintile and 63.4% in the highest. This may be partly attributed to higher rates of breast cancer in women living in higher socioeconomic status areas (Table 7).

Table 7: All cancers 5-year relative survival proportions, socioeconomic status and sex, 1992–1997

Quintile of socioeconomic status	Males	Females
	(Per cent)	
1 (highest)	61.4	63.4
2	57.0	62.3
3	55.6	61.0
4	55.2	60.9
5 (lowest)	54.3	60.4

Source: AIHW & AACR 2001.

Risk factors

In the cancer context, a risk factor is any feature or exposure that represents a greater risk of developing cancer. Risk factors can be categorised as person-related, individual and physiological risk factors (for example, genetic predisposition, sex, age, high blood pressure, raised cholesterol levels), behavioural risk factors (for example, smoking, physical inactivity, high fat diet), environmental, socioeconomic factors, and community capacity factors. Some risk factors are modifiable through lifestyle changes. This chapter focuses on key modifiable risk factors for which data are available. These are discussed, and where data are available, trends in prevalence are shown.

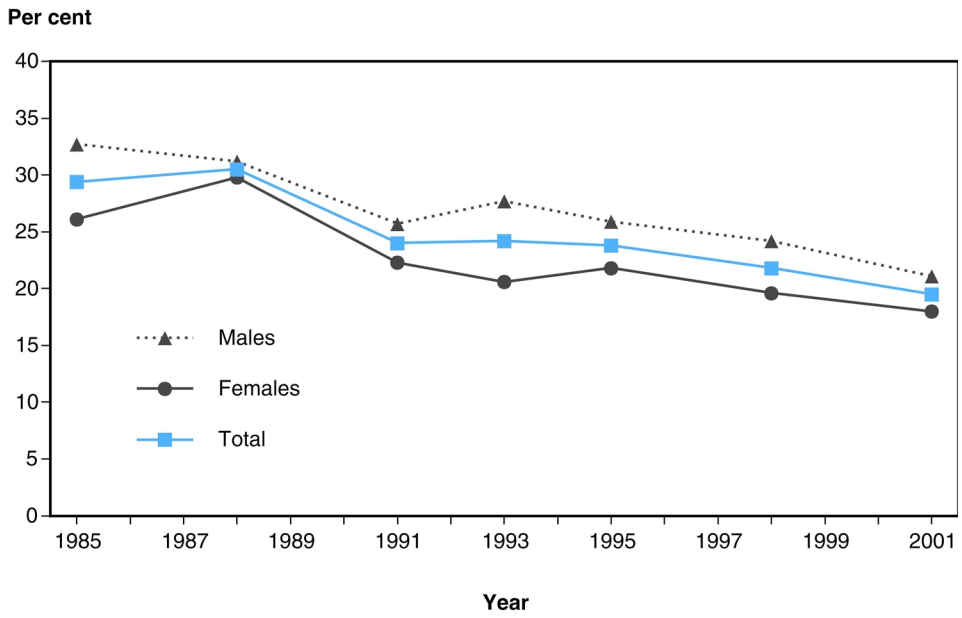
Significant modifiable behavioural risk factors that have been shown to cause cancers are tobacco smoking, poor diet, excessive sun exposure, alcohol abuse, physical inactivity and obesity. While these risk factors are the most significant, there are a range of other factors that are related to specific cancers but only contribute a small proportion of the overall explanation of cancer, for example, asbestos and mesothelioma. Some of these risk factors act independently to cause cancers but they can also work together to increase risk.

Not all cancers are the same and are affected by these risk factors in different ways. For example, tobacco smoking has been shown to have a very strong association with cancers of the respiratory system (for example, lung); however, it plays a smaller role in other cancers such as cancer of the cervix.

Tobacco smoking

Tobacco smoking is the single most preventable cause of cancer and cancer deaths. Direct smoking alone is estimated to be responsible for one-fifth of all cancer deaths in Australia and kills almost 7,000 Australians per year (AIHW 2002a). It is considered to be responsible for 90% of lung cancer deaths (Peto et al. 2000). As well as being the leading cause of lung cancer death in both men and women, smoking is linked to cancers of the larynx, oropharynx, renal (kidney) pelvis, oesophagus, anus, bladder, vulva, penis, renal parenchyma, pancreas and cervix (Cancer Council of Australia 2001; Ridolfo & Stevenson 2001; English et al. 1995).

In Australia, smoking rates have been declining since the 1950s, when it was estimated that around 70% of males and 30% of females smoked. Since 1985, smoking rates have continued to decline and, in 2001, fell below 20% for the first time (Figure 16).



Note: Includes people aged 14 years and over.

Source: AIHW 2002a.

Figure 16: Proportion of people who are daily smokers, 1985–2001

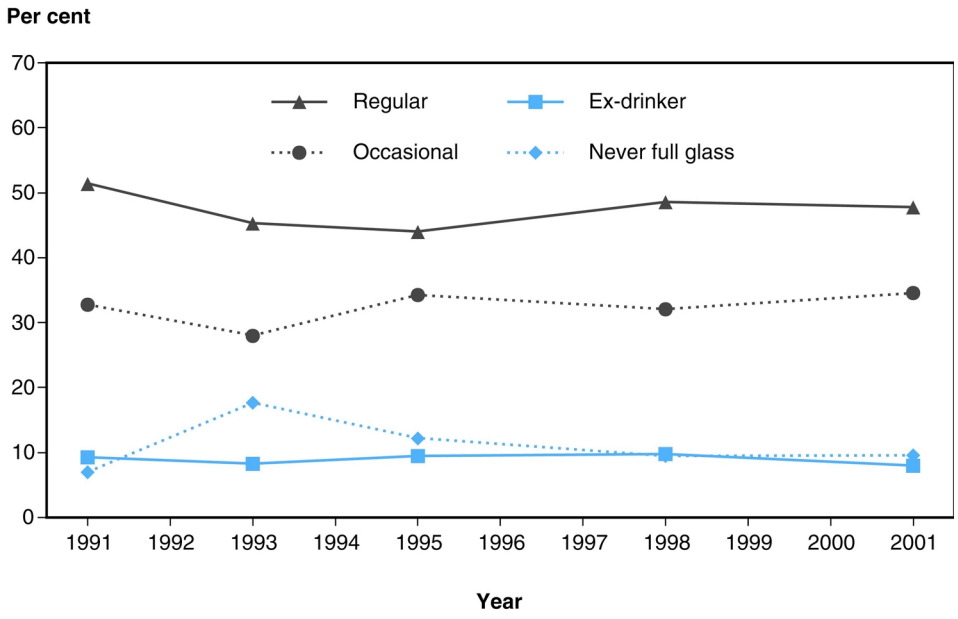
Nutrition

Evidence is building that a diet rich in fruit and vegetables, wholegrain cereals, starch and calcium while at the same time limiting the intake of fats, salt and sugar, may reduce the risk of developing cancers (AIHW 2002a). Cancers that have been linked to diet are those of the nasopharynx, stomach, liver, colon, rectum and breast (Cancer Council of Australia 2001). The decrease in deaths associated with colorectal cancer is largely attributed to improvements in diet such as consuming less fat, more cereals and vegetables and reduced alcohol consumption (AIHW 2000a).

Alcohol consumption

Alcohol consumption is known to be a contributing cause of cancers of the liver, laryngeal, oropharyngeal, oesophagus, and the female breast (Ridolfo & Stevenson 2001). It is estimated that 2,602 new cases of cancer and 1,199 deaths from cancer were directly attributable to alcohol consumption in 1999.

Australia's drinking pattern has remained largely unchanged over the last decade (Figure 17). In 2001, around 48% of the population aged 14 years and over consumed alcohol on at least one day per week. A further 35% consumed alcohol less than once per week, and the remaining 17% either no longer drank alcohol or had never consumed a full glass of alcohol.



Note: Includes people aged 14 years and over.

Source: Australia's Health 2002 from National Drug Strategy Household Survey.

Figure 17: Alcohol drinking status, 1991–2001

Screening

Breast, cervical and bowel cancers are three of a small group of cancers where there is evidence that illness and death can be reduced through population-based screening and effective follow-up treatment. National screening programs for breast cancer (via mammography) and cervical cancer (via Pap smears) have been implemented in Australia with the aim of achieving this reduction. These programs are called BreastScreen Australia and the National Cervical Screening Program. Pilot tests for a population-based screening program for bowel cancer are currently being developed, with pilot test screening expected to commence in late 2002.

BreastScreen Australia

The BreastScreen Australia program is jointly funded by the Commonwealth and State and Territory governments. It consists of a network of dedicated screening and assessment services throughout metropolitan, rural and remote areas of all Australian States and Territories. These services can be fixed or mobile and provide free biennial mammographic screening and follow-up of any suspicious lesions identified at screening to the point of diagnosis of breast cancer. The program is aimed specifically at women aged 50–69 years of age without symptoms, although women aged 40–49 years and 70 years and older may attend for screening. Women may attend without a doctor's referral.

Recruitment and reminder systems are used to promote screening and re-screening among women in the target group once every 2 years.

A comprehensive system of accreditation is used to ensure that all BreastScreen Australia services operate under a common set of standards. Each service is assessed on a regular basis by an independent team to ensure that the service provided complies with national standards.

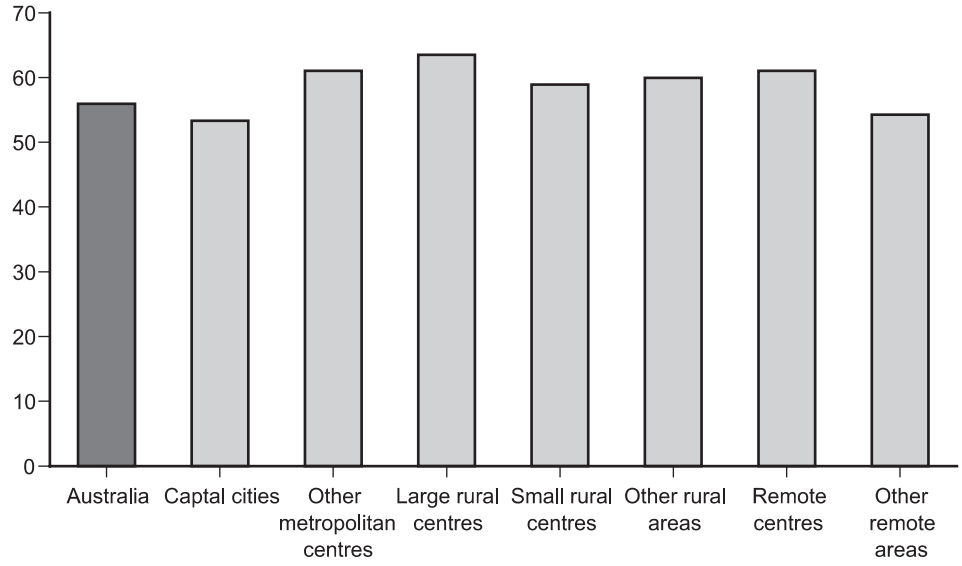
The proportion of women in the target age group who were screened under the BreastScreen Australia program in a 2-year period rose from 51.4% in the period 1996–1997 to 55.9% in the period 1998–1999 (Table 8).

Table 8: Number of women screened by BreastScreen Australia in each 2-year period, 1996–1999

	1996–1997	1997–1998	1998–1999
BreastScreen Australia			
Ages 40 years and over	1,240,885	1,367,759	1,452,263
Target population (ages 50–69 years)	844,607	921,283	975,258
Participation rate for target population (%)	51.4	54.3	55.9

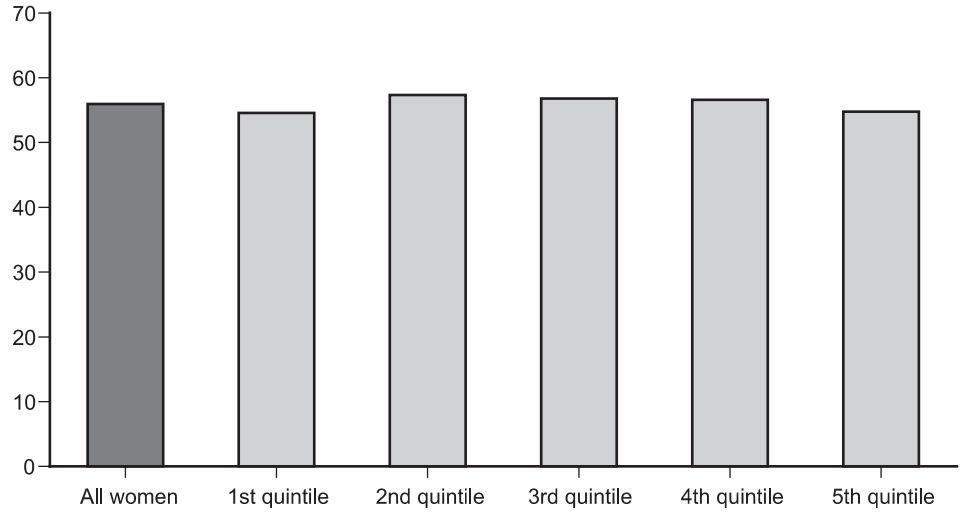
Note: Participation rates are age-standardised to the 1991 total Australian population.

Source: AIHW analysis of BreastScreen Australia data.



Source: AIHW analysis of BreastScreen Australia data.

Figure 18: Participation of women aged 50–69 years in BreastScreen Australia by region, 1998–1999



Source: AIHW analysis of BreastScreen Australia data.

Figure 19: Participation of women aged 50–69 years in BreastScreen Australia by socioeconomic status, 1998–1999

Participation rates in 1998–1999 in non-capital city metropolitan areas, large and small rural centres, other rural areas and remote centres were all statistically significantly higher than the rates for capital cities and other remote areas (Figure 18). These higher rates reflect policies aimed at encouraging participation in country areas, for example, through the use of mobile mammography units. There was no consistent pattern in participation rates by relative socioeconomic disadvantage, with no statistically significant difference in participation between the most and the least disadvantaged groups (AIHW 2002a).

National Cervical Screening Program

Screening to detect abnormalities of the cervix has been available for Australian women since the 1960s. Until the early 1990s this screening was largely unstructured, with no agreement on the screening target group or the best interval between screens. Since then it has become progressively more organised and in 1995 the program became known as the National Cervical Screening Program.

Unlike breast screening, cervical screening in Australia does not operate through a separate dedicated screening and assessment service. Instead, screening services are provided as part of mainstream health services, with approximately 80% of Pap smears performed by general practitioners. Cervical screening is funded mainly by Medicare (61%) with the remainder funded by Commonwealth government contributions through special purpose payments to State and Territory governments (23%) and these governments' own revenue sources (16%).

The National Cervical Screening Program has both national and State and Territory components. Although policy is usually decided at a national level, coordination of screening activity mainly happens at a State and Territory level.

Cervical cytology registries operate in all States and Territories. The major functions of the registries are to:

- remind women to attend for screening
- ensure the follow-up of women with abnormal Pap smears
- provide cervical screening histories to laboratories and clinicians to aid reporting and management
- monitor the effects of initiatives to improve participation by women in screening.

The current Australian recommendation is for all women who have been sexually active at any stage in their lives to have a Pap smear every 2 years until they reach the age of 70 years. Screening may cease at the age of 70 for women who have had two normal Pap smears within the last 5 years. Women over 70 years who have never had a Pap smear or who request a Pap smear are also screened. However, for reporting purposes the target group is taken to be all women aged between 20 and 69 years who have not had a hysterectomy.

The proportion of women in the target age group who were screened under the National Cervical Cancer Screening Program in a 2-year period rose from 62.3% in the period 1996–1997 to 64.8% in the period 1998–1999 (Table 9).

Table 9: Number of women screened by the National Cervical Screening Program in each 2-year period, 1996–1999

	1996–1997	1997–1998	1998–1999
National Cervical Screening Program			
Ages 20 years and over	2,630,235	2,721,650	2,777,324
Target population (ages 20–69 years)	2,563,108	2,653,504	2,716,364
Participation rate for target population (%)	62.3	63.9	64.8

Notes

1. Participation rates are age standardised to the 1991 total Australian population.
2. The Queensland Health Pap Smear registry only commenced in February 1999. Hence the data presented here for cervical screening exclude screening in Queensland.

Source: AIHW analysis of State and Territory Cervical Cytology Registry data.

Hospital inpatients with cancer

The Australian Institute of Health and Welfare (AIHW) National Hospital Morbidity Database (NHMD) contains diagnosis and treatment information for inpatients in almost all public and private hospitals in Australia from 1993–94 to 2000–01. AIHW publishes detailed statistics on these in June each year for inpatient separations for the previous financial year. The most recent report is for 2000–01 (AIHW 2002).

The NHMD contains a wealth of data and many variables, with many interrelationships. This chapter presents summary data for admitted patients for whom one of the National Health Priority Area cancers was their principal diagnosis in 2000–01.

Principal diagnosis

The principal diagnosis is defined as the diagnosis established, after study, to be chiefly responsible for occasioning the admitted patient's episode of care in hospital. Principal diagnoses for 2000–01 were classified, coded and reported to the National Hospital Morbidity database by all States and Territories using the second edition of the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (ICD-10-AM)* (NCCH 2000).

Same-day patients

In 2000–01, 85% of separations where the patient underwent chemotherapy administration were on a same-day basis. Reporting average length of stay (ALOS) based upon all patient separations may be biased if same-day patients are included; therefore the ALOS has been reported excluding same-day stays.

In the financial year 2000–01 there were 306,536 hospital separations where cancer was recorded as the principal diagnosis. This represents 5.0% of all separations in that year.

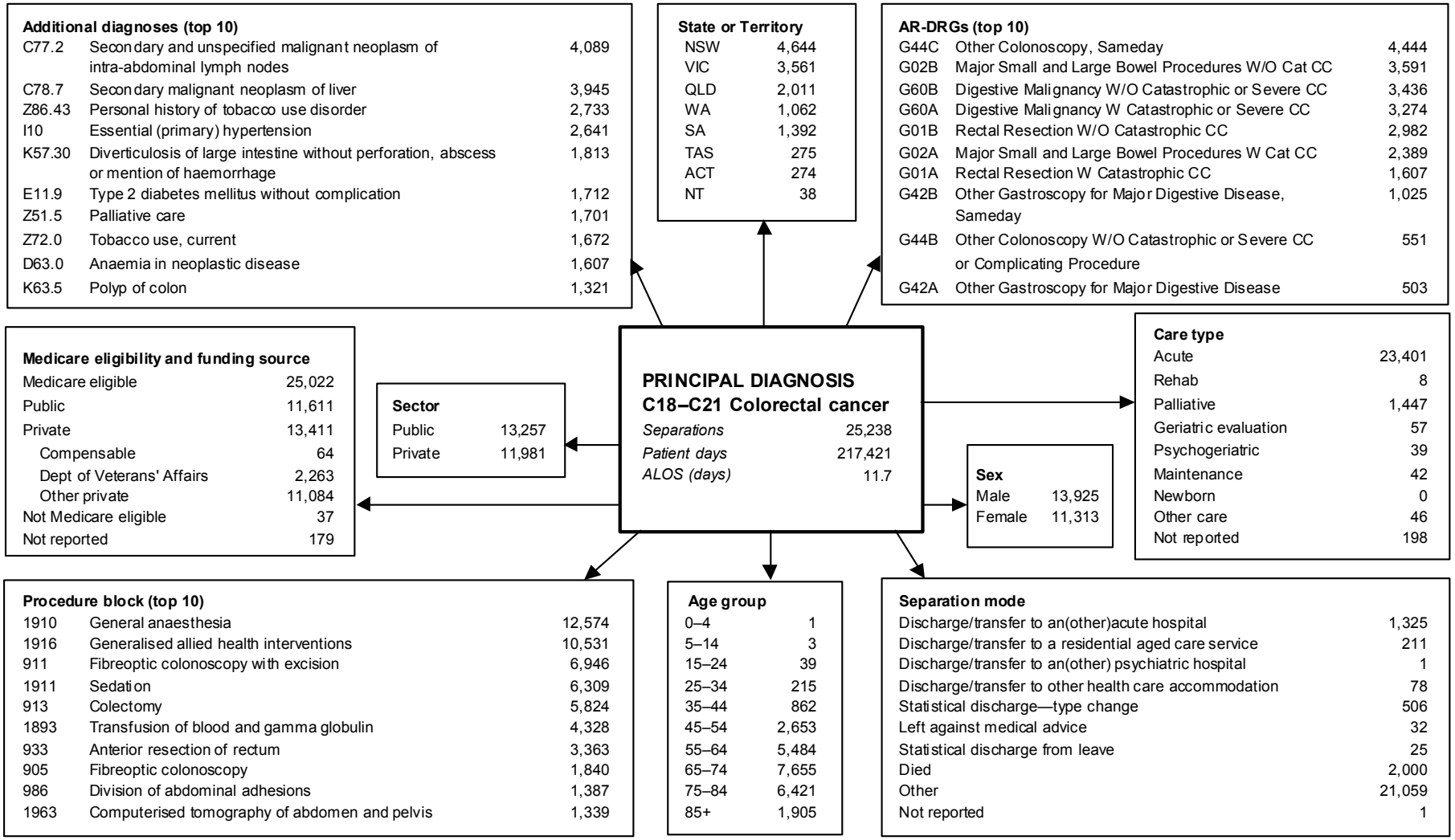
Interrelationships for diagnoses of National Health Priority Area cancers

Colorectal cancer—ICD-10-AM C18–C21

Figure 20 presents the interrelationships with various data elements where the principal diagnosis was colorectal cancer. Colorectal cancer includes *Malignant neoplasm of colon* (C18), *Malignant neoplasm of rectosigmoid junction* (C19), *Malignant neoplasm of rectum* (C20) and *Malignant neoplasm of anus and anal canal* (C21).

There were 25,238 separations where colorectal cancer was recorded as the principal diagnosis. Of these, 7,360 (29%) were same-day patients. For non-same-day patients, the average length of stay was 11.7 days. Other key points from the figure are:

- 53% of separations were in the public sector.
- 46% of separations were for public patients.
- 55% of separations were for males.
- The 65–74 years age group had the largest number of separations (30%).
- The majority of patients (93%) had acute care and 6% had palliative care.
- A large proportion of patients (83%) had a separation mode of *Other*, indicating that these patients went home after separation from hospital, whereas 8% had a separation mode of *Died*.
- The most common diagnosis in addition to a principal diagnosis of colorectal cancer was *Secondary and unspecified malignant neoplasm of intra-abdominal lymph nodes* (C77.2).
- The most common surgical procedure performed was *Fibreoptic Colonoscopy with excision* (Block 911).
- The most commonly reported AR-DRG was *Other Colonoscopy, Sameday* (AR-DRG G44C).



Note: Main abbreviations: ALOS—average length of stay, W—with, W/O—without, Cat—catastrophic, CC—complication or comorbidity. ALOS excludes same-day patients.

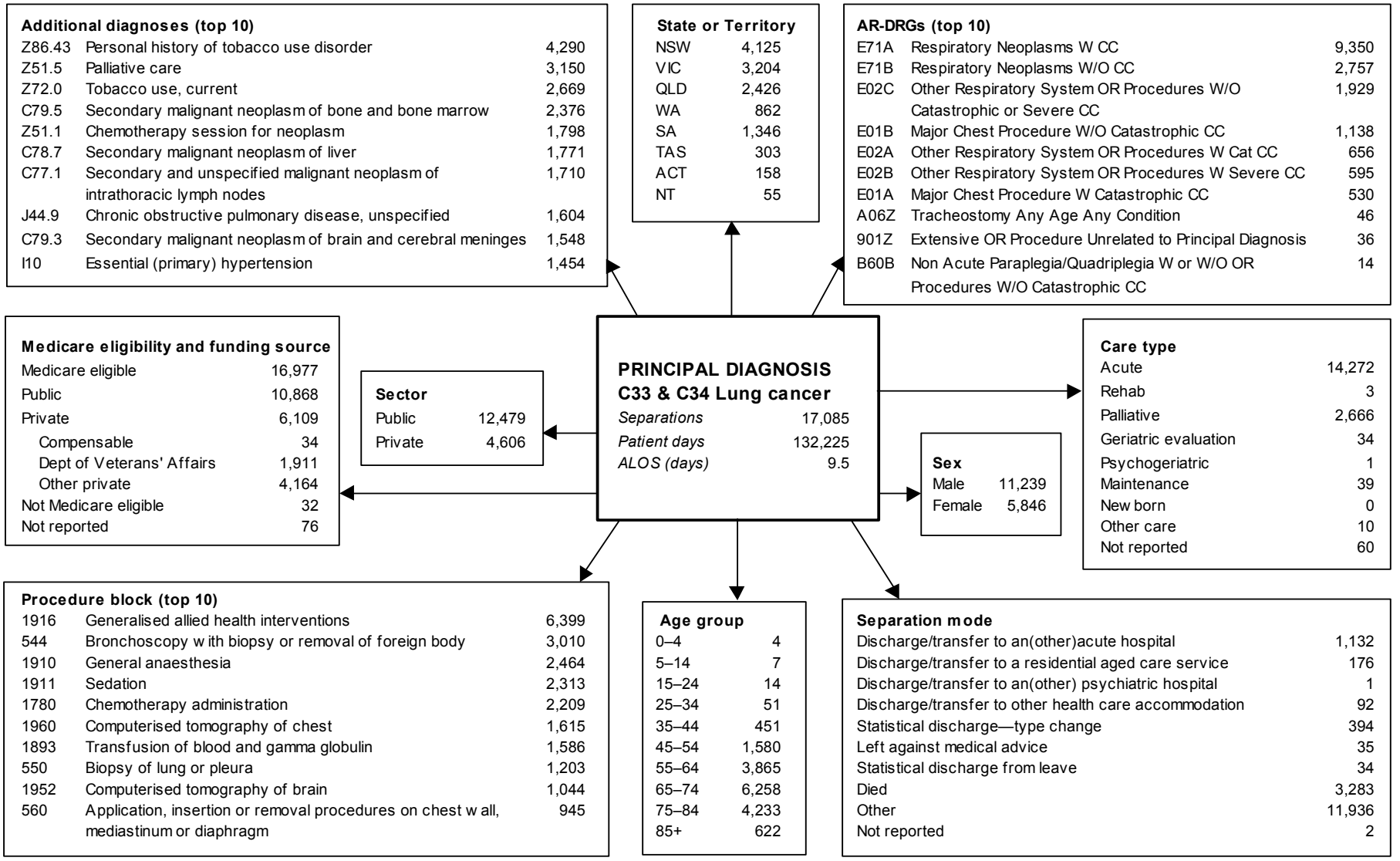
Figure 20: Inpatients with a principal diagnosis of colorectal cancer, all hospitals, Australia, 2000–2001

Lung cancer—ICD-10-AM C33 & C34

Figure 21 presents the interrelationships with various data elements where the principal diagnosis was lung cancer. Lung cancer includes *Malignant neoplasm of trachea* (C33) and *Malignant neoplasm of bronchus and lung* (C34).

There were 17,085 separations where lung cancer was recorded as the principal diagnosis. Of these, 3,475 (20%) were same-day patients. For non-same-day patients, the average length of stay was 9.5 days. Other key points from the figure are:

- 73% of separations were in the public sector.
- 64% of separations were for public patients.
- 66% of separations were for males.
- The 65–74 years age group had the largest number of separations (37%).
- The majority of patients (84%) had acute care and 16% had palliative care.
- A large proportion of patients (70%) had a separation mode of *Other*, indicating that these patients went home after separation from hospital, whereas 19% had a separation mode of *Died*.
- The most common diagnosis in addition to a principal diagnosis of lung cancer was *Personal history of tobacco use disorder* (Z86.43).
- The most common surgical procedure performed was *Bronchoscopy with biopsy or removal of foreign body* (Block 544).
- The most commonly reported AR-DRG was *Respiratory neoplasms with complication or comorbidity* (AR-DRG E71A).



Note: Main abbreviations: ALOS—average length of stay, W—with, W/O—without, Cat—catastrophic, CC—complication or comorbidity, OR—operating room. ALOS excludes same-day patients.

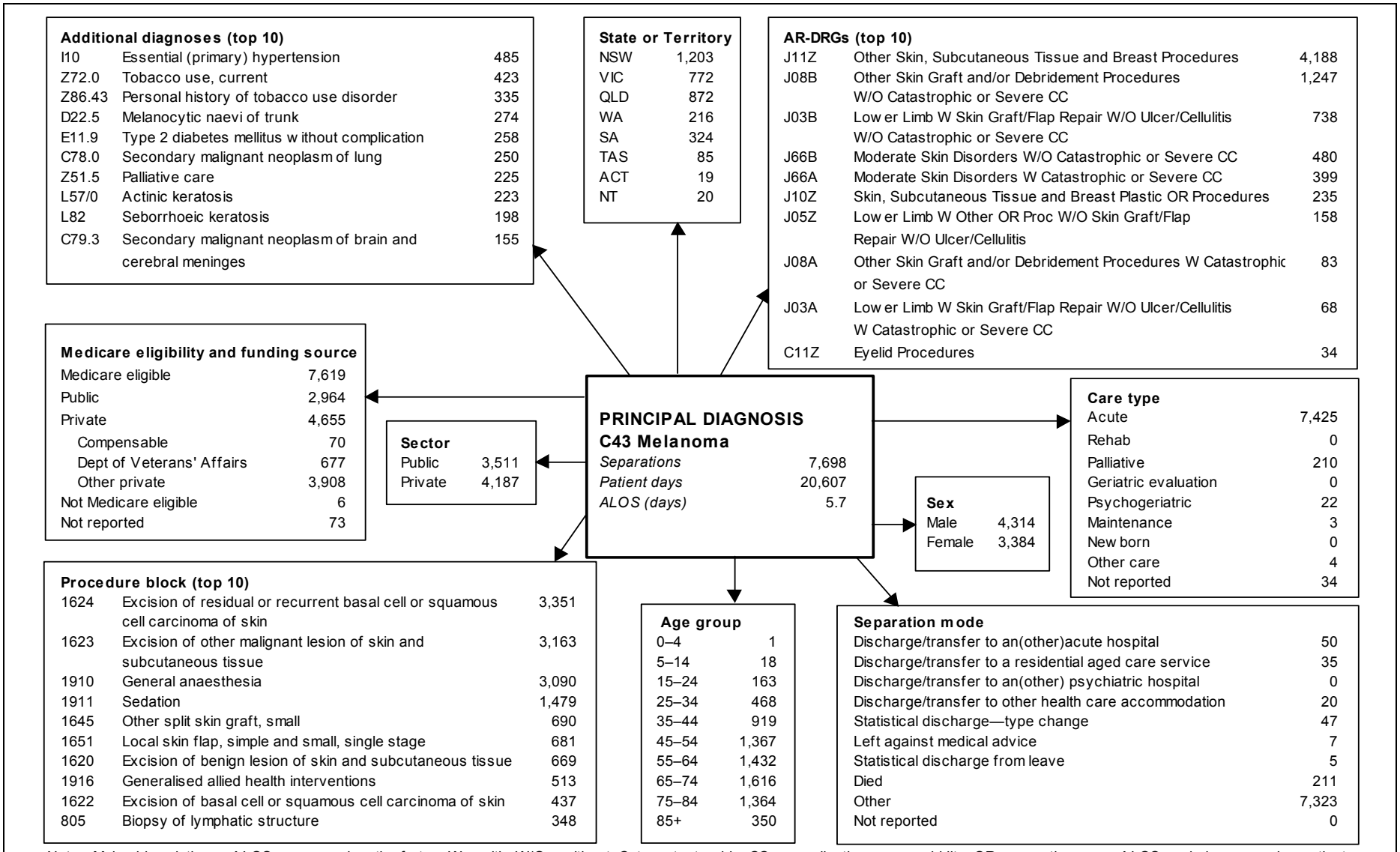
Figure 21: Inpatients with a principal diagnosis of lung cancer, all hospitals, Australia, 2000–2001

Melanoma skin cancer—ICD-10-AM C43

Figure 22 presents the interrelationships with various data elements where the principal diagnosis was melanoma. Melanoma skin cancer includes M*alignant melanoma of skin* (C43).

There were 7,698 separations where melanoma was recorded as the principal diagnosis. Of these, 4,935 (64%) were same-day patients. For non-same-day patients, the average length of stay was 5.7 days. Other key points from the figure are:

- 46% of separations were in the public sector.
- 39% of separations were for public patients.
- 56% of separations were for males.
- The 65–74 years age group had the largest number of separations (21%).
- The majority of patients (96%) had acute care and 3% had palliative care.
- A large proportion of patients (95%) had a separation mode of *Other*, indicating that these patients went home after separation from hospital, whereas 3% had a separation mode of *Died*.
- The most common diagnosis in addition to a principal diagnosis of melanoma was *Essential (primary) hypertension* (I10).
- The most common surgical procedures performed were excisions (Blocks 1624 and 1623).
- The most commonly reported AR-DRG was *Other Skin, Subcutaneous Tissue and Breast Procedures* (AR-DRG J11Z).



Note: Main abbreviations: ALOS—average length of stay, W—with, W/O—without, Cat—catastrophic, CC—complication or comorbidity, OR—operating room. ALOS excludes same-day patients.

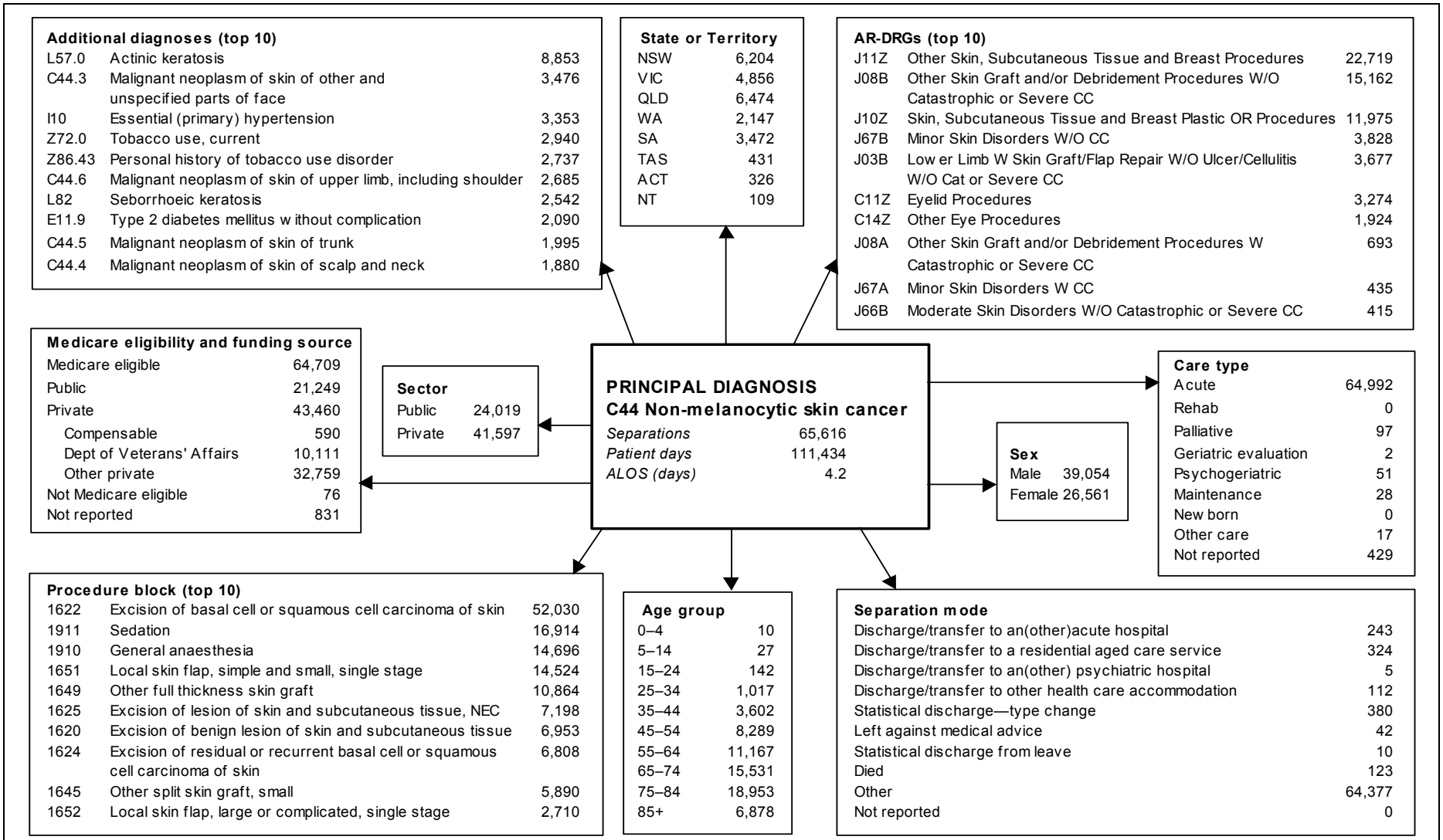
Figure 22: Inpatients with a principal diagnosis of melanoma, all hospitals, Australia, 2000–2001

Non-melanocytic skin cancer—ICD-10-AM C44

Figure 23 presents the interrelationships with various data elements where the principal diagnosis was non-melanocytic skin cancer (NMSC). NMSC includes *Other malignant neoplasms of skin* (C44).

There were 65,616 separations where non-melanocytic skin cancer was recorded as the principal diagnosis. Of these, 51,395 (78%) were same-day patients. For non-same-day patients, the average length of stay was 4.2 days. Other key points from the figure are:

- 37% of separations were in the public sector.
- 32% of separations were for public patients.
- 61% of separations were for males.
- The 75–84 years age group had the largest number of separations (34%).
- The majority of patients (99%) had acute care and less than 1% had palliative care.
- A large proportion of patients (98%) had a separation mode of *Other*, indicating that these patients went home after separation from hospital, whereas less than 1% had a separation mode of *Died*.
- The most common diagnosis in addition to a principal diagnosis of NMSC was *Actinic keratosis* (L57.0).
- The most common procedure performed was *Excision of basal cell or squamous cell carcinoma of skin* (Block 1622).
- The most commonly reported AR-DRG was *Other Skin, Subcutaneous Tissue and Breast Procedures* (AR-DRG J11Z).



Note: Main abbreviations: ALOS—average length of stay, W—w ith, W/O—w ithout, Cat—catastrophic, CC—complication or comorbidity, OR—operating room, NEC—not elsew here classified. ALOS excludes same-day patients. One person w as of unknow n sex.

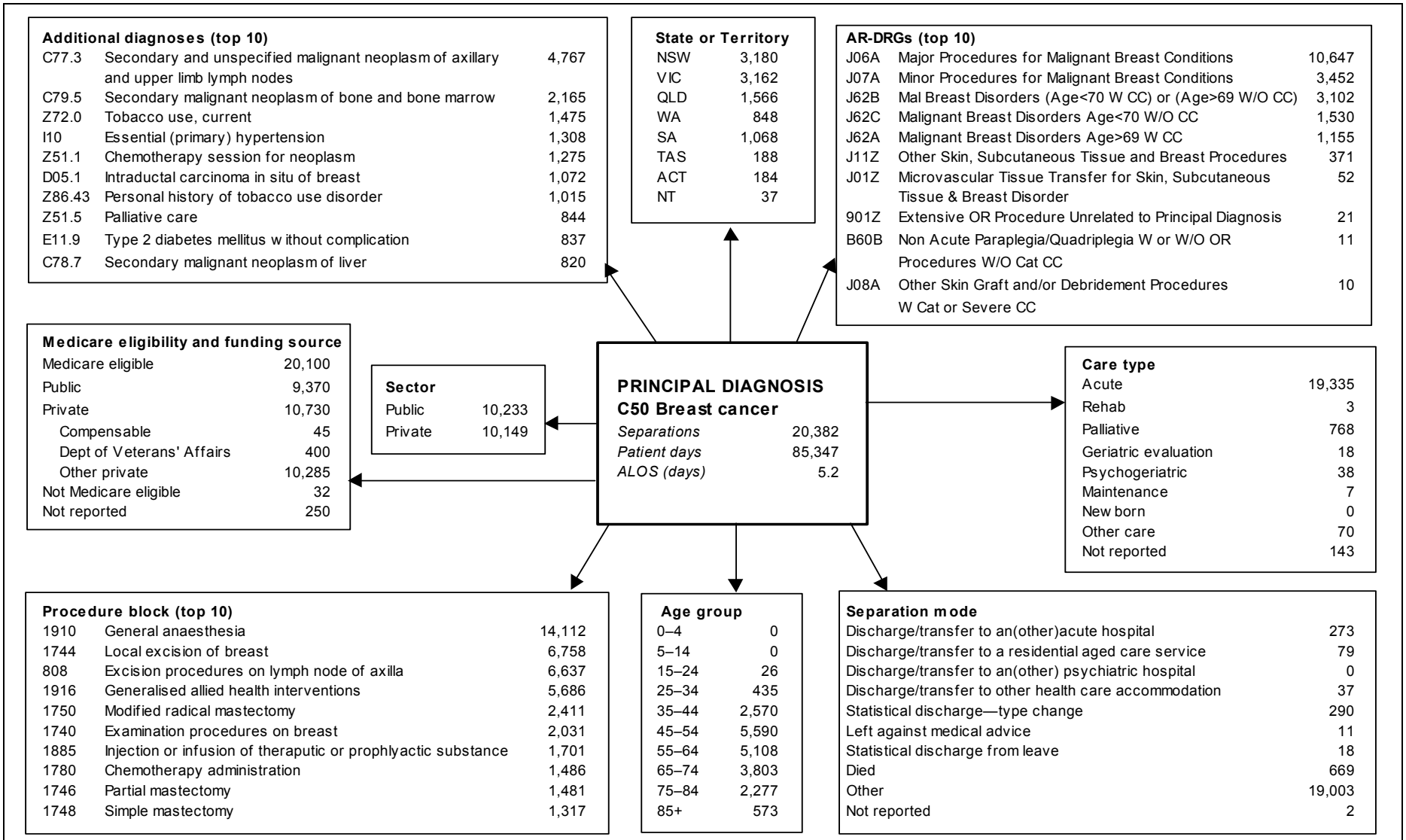
Figure 23: Inpatients with a principal diagnosis of non-melanocytic skin cancer, all hospitals, Australia, 2000–2001

Breast cancer—ICD-10-AM C50

Figure 24 presents the interrelationships with various data elements where the principal diagnosis was breast cancer. Breast cancer includes *Malignant neoplasm of breast* (C50). The analysis of breast cancer was restricted to females only.

There were 20,382 separations where breast cancer was recorded as the principal diagnosis. Of these, 4,804 (24%) were same-day patients. For non-same-day patients, the average length of stay was 5.2 days. Other key points from the figure are:

- 50% of separations were in the public sector.
- 46% of separations were for public patients.
- The 45–54 years age group had the largest number of separations (27%).
- The majority of patients (95%) had acute care and 4% had palliative care.
- A large proportion of patients (93%) had a separation mode of *Other*, indicating that these patients went home after separation from hospital, whereas 3% had a separation mode of *Died*.
- The most common diagnosis in addition to a principal diagnosis of breast cancer was *Secondary and unspecified malignant neoplasm of axillary and upper limb lymph nodes* (C77.3).
- The most common surgical procedure performed was *Local excision of breast* (Block 1744).
- The most commonly reported AR-DRG was *Major Procedures for Malignant Breast Conditions* (AR-DRG J06A).



Note: Main abbreviations: ALOS—average length of stay (excludes same-day), W—w ith, W/O—w ithout, Cat—catastrophic, CC—complication or comorbidity, Mal—malignant, OR—operating room.

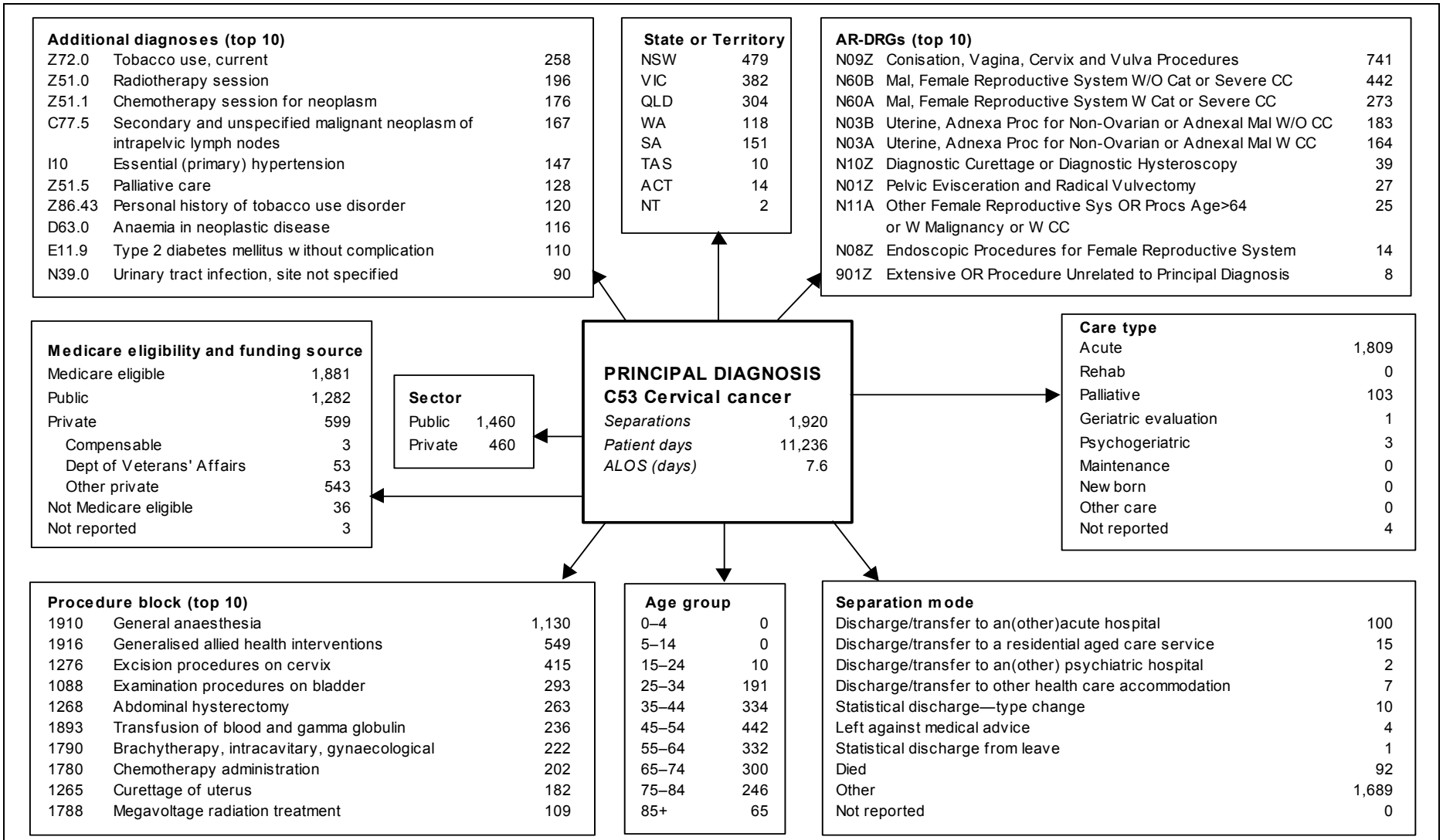
Figure 24: Inpatients with a principal diagnosis of breast cancer, all hospitals, Australia, 2000–2001

Cancer of the cervix—ICD-10-AM C53

Figure 25 presents the interrelationships with various data elements where the principal diagnosis was cancer of the cervix. Cervical cancer includes *Malignant neoplasm of cervix uteri* (C53).

There were 1,920 separations where cervical cancer was recorded as the principal diagnosis. Of these, 516 (27%) were same-day patients. For non-same-day patients, the average length of stay was 7.6 days. Other key points from the figure are:

- 76% of separations were in the public sector.
- 67% of separations were for public patients.
- The 45–54 years age group had the largest number of separations (23%).
- The majority of patients (94%) had acute care and 5% had palliative care.
- A large proportion of patients (88%) had a separation mode of *Other*, indicating that these patients went home after separation from hospital, whereas 5% had a separation mode of *Died*.
- The most common diagnosis in addition to a principal diagnosis of cancer of the cervix was *Tobacco use, current* (Z72.0).
- The most common surgical procedure performed was *Excision procedures on cervix* (Block 1276).
- The most commonly reported AR-DRG was *Conisation, Vagina, Cervix and Vulva Procedures* (AR-DRG N09Z).



Note: Main abbreviations: ALOS—average length of stay, W—with, W/O—without, Cat—catastrophic, CC—complication or comorbidity, Proc—procedure, Mal—malignancy, OR—operating room. ALOS excludes same-day patients.

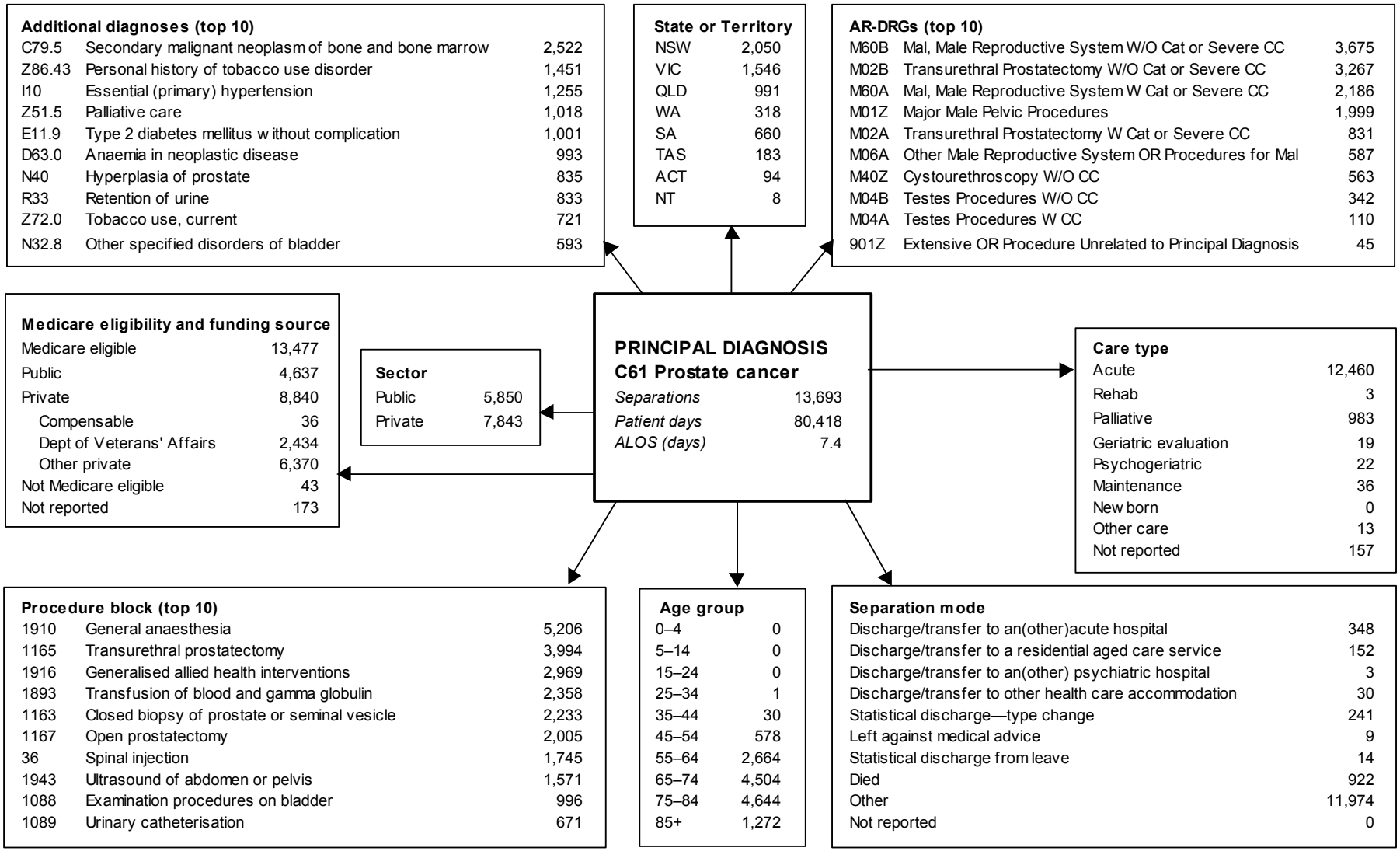
Figure 25: Inpatients with a principal diagnosis of cervical cancer, all hospitals, Australia, 2000–2001

Prostate cancer—ICD-10-AM C61

Figure 26 presents the interrelationships with various data elements where the principal diagnosis was prostate cancer. Prostate cancer includes *Malignant neoplasm of prostate* (C61).

There were 13,693 separations where prostate cancer was recorded as the principal diagnosis. Of these, 3,203 (23%) were same-day patients. For non-same-day patients, the average length of stay was 7.4 days. Other key points from the figure are:

- 43% of separations were in the public sector.
- 34% of separations were for public patients.
- The 75–84 years age group had the largest number of separations (34%).
- The majority of patients (91%) had acute care and 7% had palliative care.
- A large proportion of patients (87%) had a separation mode of *Other*, indicating that these patients went home after separation from hospital, whereas 7% had a separation mode of *Died*.
- The most common diagnosis in addition to a principal diagnosis of prostate cancer was *Secondary malignant neoplasm of bone and bone marrow* (C79.5).
- The most common surgical procedure performed was *Transurethral prostatectomy* (Block 1165).
- The most commonly reported AR-DRG was *Malignancy, Male Reproductive System Without Catastrophic or Severe Complication or Comorbidity* (AR-DRG M60B).



Note: Main abbreviations: ALOS—average length of stay (excludes same-day), W—with, W/O—without, Cat—catastrophic, CC—complication or comorbidity, Mal—malignancy, OR—operating room.

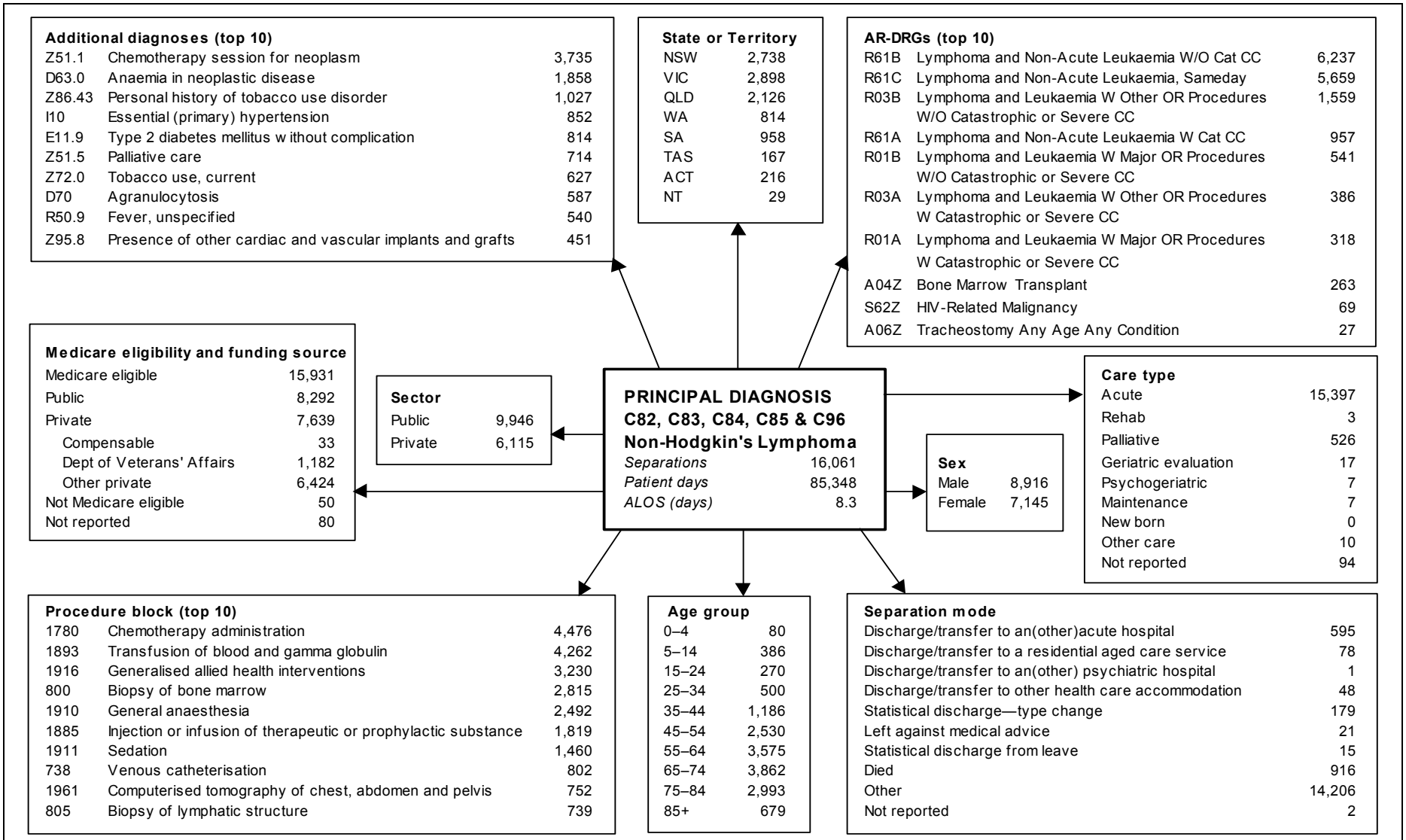
Figure 26: Inpatients with a principal diagnosis of prostate cancer, all hospitals, Australia, 2000–2001

Non-Hodgkin's lymphoma—ICD-10-AM C82–C85 & C96

Figure 27 presents the interrelationships with various data elements where the principal diagnosis is non-Hodgkin's lymphoma. Non-Hodgkin's lymphoma includes *Follicular (nodular) non-Hodgkin's lymphoma* (C82), *Diffuse non-Hodgkin's lymphoma* (C83), *Peripheral and cutaneous T-cell lymphomas* (C84), *Other and unspecified types of non-Hodgkin's lymphoma* (C85) and *Other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue* (C96).

There were 16,061 separations where non-Hodgkin's lymphoma was recorded as the principal diagnosis. Of these, 6,507 (41%) were same-day patients. For non-same-day patients, the average length of stay was 8.3 days. Other key points from the figure are:

- 62% of separations were in the public sector.
- 52% of separations were for public patients.
- 56% of separations were for males.
- The 65–74 years age group had the largest number of separations (24%).
- The majority of patients (96%) had acute care and 3% had palliative care.
- A large proportion of patients (88%) had a separation mode of *Other*, indicating that these patients went home after separation from hospital, whereas 6% had a separation mode of *Died*.
- The most common diagnosis in addition to a principal diagnosis of non-Hodgkin's lymphoma was *Chemotherapy session for neoplasm* (Z51.1).
- The most common procedures performed were *Chemotherapy administration* (Block 1780), *Transfusion of blood and gamma globulin* (Block 1893) and *Biopsy of bone marrow* (Block 800).
- The most commonly reported AR-DRG was *Lymphoma and Non-Acute Leukaemia without Catastrophic Complication or Comorbidity* (AR-DRG R61B).



Note: Main abbreviations: ALOS—average length of stay, W—w ith, W/O—w ithout, Cat—catastrophic, CC—complication or comorbidity, OR—operating room. ALOS excludes same-day patients.

Figure 27: Inpatients with a principal diagnosis of non-Hodgkin's lymphoma, all hospitals, Australia, 2000–2001

All priority cancers

Each of the eight priority cancers analysed included the following in their top ten additional diagnoses:

- I10—Essential (primary) hypertension
- Z72.0—Tobacco use, current
- Z86.43—Personal history of tobacco use disorder

All priority cancers with the exception of lung cancer included E11.9—Type 2 diabetes mellitus without complication amongst the top ten additional diagnoses, and all with the exception of non-melanocytic skin cancer included Z51.5—Palliative care.

Each of the priority cancers analysed included 1910—General anaesthesia amongst the top ten procedures. All priority cancers with the exception of non-melanocytic skin cancer included 1916—Generalised allied health interventions amongst the top ten procedures.

Non-melanocytic skin cancer was the principal diagnosis associated with the greatest number of separations. This cancer had the largest proportion of same-day patients.

Colorectal cancer was the principal diagnosis associated with the longest average length of stay for non-same-day patients.

Cancer workforce

The Australian Institute of Health and Welfare publishes health workforce statistics from three main sources:

- national collections in conjunction with State and Territory health authorities for the registered health occupations;
- Medicare provider statistics tabulated by the Commonwealth Department of Health and Ageing; and
- the 5-yearly population census conducted by the Australian Bureau of Statistics.

Health workforce statistics are also collected in surveys and censuses by professional bodies, and in a number of other private regular and ad hoc data collections.

The cancer workforce comprises:

- a diagnostic workforce, including members of the workforce for the national screening programs;
- a medical treatment workforce of medical and nursing professionals;
- a palliative and hospice care workforce;
- a paid and voluntary patient support workforce including counsellors and cancer support organisations; and
- a public health workforce including cancer registries, the State and Territory cancer councils, other health promotion groups, Commonwealth, State and local government cancer control units, and research bodies.

Data on these are limited, incomplete and generally not up to date. They include the following.

Medical workforce

Almost all medical practitioners in Australia treat some persons with cancer. Several medical specialties have a high proportion of patients with cancer. The 1995 and 1998 national figures for these are seen in Table 10.

In its 2001 review of the specialist medical and haematological oncology workforce in Australia, the Australian Medical Workforce Advisory Committee (AMWAC) reported that there were 337 medical and haematological oncologists in 2000, and there was both a shortage of these oncologists and a maldistribution of the existing workforce (AMWAC 2001a).

In its 2001 review of the specialist radiology workforce, AMWAC reported that there were 1,148 specialist radiologists in 2000, and that this workforce was also undersupplied (AMWAC 2001b).

AMWAC also reviewed the specialist radiation oncology workforce in 1998 and found shortages in that workforce (AMWAC 1998). In each case AMWAC recommended increases in training numbers to address the shortage and ongoing annual growth in demand for cancer services.

Table 10: Medical specialties with a high proportion of patients with cancer, 1995 and 1998

Medical specialty	1995	1998
	Number of practising specialists	
Medical oncology	154	167
Radiation oncology	127	152
Clinical haematology	133	135
Haematology	66	61
Nuclear medicine	129	141
Total	**609**	**656**

Source: AIHW: *Medical Labour Force 1995*, *Medical Labour Force 1998*.

Nursing workforce

In 1997, there were 2,412 registered nurses and 273 enrolled nurses working in oncology as their main field of nursing practice. There were also 813 registered nurses and 244 enrolled nurses employed in hospices (AIHW: *Nursing Labour Force 1999*).

Medical imaging workforce

At the 1996 census there were 4,719 medical diagnostic radiographers, 701 radiation therapists, 400 nuclear medicine technologists and 704 sonographers employed in Australia (Australian Bureau of Statistics).

General practice and cancer patients

The continuous national study of general practice activity in Australia, known as the BEACH (Bettering the Evaluation and Care of Health) program, provides insight into the patients and problems managed in general practice and the ways in which GPs manage the problems. In BEACH, a random sample of about 1,000 GPs provides details of around 100,000 GP–patient encounters each year. The study is conducted by the General Practice Statistics and Classification Unit (GPSCU—an AIHW collaborating unit within the Family Medicine Research Centre, University of Sydney). The data tables in this section have been prepared by the GPSCU and there are further detailed GPSCU analyses of BEACH data in reports on both the AIHW web site and the GPSCU web site www.fmrc.org.au/beach.htm.

This section represents a summary of the data collected in the first four years of the study, between April 1998 and March 2002. It provides information about those problems that the GP labelled as any type of cancer. These data are drawn from 4,013 GPs and represent a database of 401,300 encounters. The participating GPs were randomly selected from the Health Insurance Commission list of active GPs (those who provided more than 375 GP services in the previous quarter). Each GP completed a paper encounter record for each of 100 encounters. Data elements included:

- date of encounter
- service item number/form of payment/indirect encounters (for example, telephone consultations)
- patient age and sex and other socio-demographics
- patient's reasons for encounter (up to three)
- diagnoses/problems managed (up to four)
- status of each problem to the patient (new/old)
- medications prescribed (up to four per problem)
- other treatments provided (up to two per problem)
- referral, pathology tests and imaging ordered.

Cancers were managed at a rate of 18.8 per 1,000 GP–patient encounters. Extrapolated to the total GP–patient encounters in any one year across the country, these data suggest there are about two million encounters in general practice in which a cancer is managed. Table 11 presents the top ten types of cancer reported by GPs in these encounters. These ten types of cancer together accounted for around 78% of the GP–patient contacts with a cancer. The top three types—basal and squamous cell carcinoma and prostate cancer—accounted for around 51% of cancers managed. All skin cancers (both melanoma and non-melanocytic skin cancers) together accounted for around 46% of cancers managed at these encounters.

Table 12 summarises details of the GPs' management of cancer. GPs prescribed, advised or supplied medications at a rate of 31 medications per 100 problems. The majority of these were prescribed (29.0 per 100 cancer contacts), with the remainder being medication supplied by the GP (1.4 per 100) or over-the-counter medication advised by the GP (0.6 per 100).

GPs provided other treatments at a rate of 40.0 per 100 contacts with a cancer. These comprised both clinical treatments (at a rate of 16.9 per 100 contacts) and procedural treatments (23.8 per 100 contacts).

The GP referred the patient to another health professional or treatment service at a rate of 20.0 per 100 contacts with cancer. The majority of these referrals were to a specialist (18.5 per 100 cancer contacts). Other referrals were to an allied health service (2.6 per 100) or to a hospital or emergency department (1.0 per 100).

Pathology tests were ordered at a rate of 26.5 tests (or groups of tests) per 100 contacts with cancer and imaging tests were ordered at a rate of 4.5 per 100 contacts.

Table 13 summarises the types of medication prescribed for problems involving a cancer. The most common medication type (opioids) accounted for nearly a quarter (24.8%) of these prescriptions. The top ten types of medication together accounted for around 70% of these prescriptions.

Table 14 summarises the types of other treatments provided by GPs for problems involving a malignancy. Treatments involving removal of tissue comprised 40.6% of treatments performed by GPs for cancer. The top ten treatments together accounted for 97.8% of treatments performed by GPs for cancer.

Table 15 summarises referrals by GPs to another health professional or treatment service for problems involving a cancer. More than half (58.9%) of these referrals were to a dermatologist, surgeon or plastic surgeon. The top ten referral types accounted for 86.0% of all referrals for cancers.

Table 11: Top 10 types of cancer managed at GP–patient encounters

Type of cancer	Number	Estimated national number of contacts per year	Rate per 1,000 encounters	Percentage of total cancer contacts
Basal cell carcinoma	1,956	511,800	4.9	25.9
Squamous cell carcinoma	1,002	262,200	2.5	13.3
Prostate cancer	916	239,700	2.3	12.1
Breast cancer (female)	650	170,100	1.6	8.6
Lung cancer	347	90,800	0.9	4.6
Melanoma	293	76,700	0.7	3.9
Other skin cancer	233	61,000	0.6	3.1
Large bowel cancer	218	57,000	0.5	2.9
Colon cancer	176	46,100	0.4	2.3
Lymphoma	133	34,800	0.3	1.8
All cancers	7,560	1,978,800	18.8	100.0

Table 12: GPs′ management of cancer

		Rate per 100 cancer contacts	
	Number	Rate	95% confidence interval
Medications			
All medications	2,345	31.0	29.3–32.8
Prescribed medications	2,191	29.0	27.3–30.7
Advised over-the-counter medications	45	0.6	0.4–0.7
Medications supplied by GP	109	1.4	1.2–1.6
Other treatments given			
All treatments	3,081	40.8	38.7–42.8
Clinical treatments	1,280	16.9	15.8–18.0
Procedural treatments	1,801	23.8	22.4–25.3
Referrals			
All referrals	1,515	20.0	13.6–26.5
Referrals to a hospital	78	1.0	0.0–23.5
Referrals to a specialist	1,396	18.5	11.6–25.3
Referrals to allied health services	196	2.6	0.0–11.7
Referrals to an emergency department	2	0.0	n/a
Pathology tests ordered	2,000	26.5	23.1–29.8
Imaging tests ordered	338	4.5	0.5–8.5

Table 13: Top ten medications prescribed by GPs for management of cancer

		Per cent of all prescriptions		Rate per 100 cancer contacts	
ATC[(a)] class of medication	Number	Per cent	95% confidence interval	Rate	95% confidence interval
Opioids	543	24.8	21.3–28.3	7.2	3.1–11.2
Hormones and related agents	250	11.4	6.3–16.5	3.3	0.0–6.6
Other analgesics and antipyretics	200	9.1	4.1–14.1	2.7	0.0–7.0
Hormone antagonists and related agents	177	8.1	2.7–13.5	2.3	0.0–6.8
Corticosteroids for systemic use, plain	86	3.9	0.0–9.7	1.1	0.0–6.6
Propulsives	84	3.8	0.0–10.1	1.1	0.0–8.0
Hypnotics and sedatives	63	2.9	0.0–10.1	0.8	0.0–6.8
Antipsychotics	42	1.9	0.0–8.1	0.6	0.0–7.1
Antiandrogens	40	1.8	0.0–11.8	0.5	0.0–8.3
Anxiolytics	37	1.7	0.0–11.0	0.5	0.0–8.9
All classes	2,191	100.0	n/a	29.0	25.3–32.7

(a) Anatomical Therapeutic Chemical classification index, WHO Collaborating Centre for Drug Statistics Methodology.

Table 14: Top ten treatments used by GPs for management of cancer

Treatment	Number	Per cent of all other treatments		Rate per 100 cancer contacts	
		Rate	95% confidence interval	Rate	95% confidence interval
Excision/removal tissue/Biopsy/Destruction/Debridement/Cauterisation	1,313	42.6	39.4–45.8	17.4	14.1–20.6
Therapeutic counselling/Listening	595	19.3	14.8–23.8	7.9	4.1–11.6
Observation/Health education/advice	550	17.9	14–21.7	7.3	4.6–10
Repair/Fixation-suture/Cast/Prosthetic device (Apply/remove)	252	8.2	3.1–13.3	3.3	0.0–7.0
Administrative procedure	83	2.7	0–11.5	1.1	0.0–6.7
Local injection/Infiltration	71	2.3	0–12.1	0.9	0.0–8.4
Dressing/Pressure/Compression/Tamponade	58	1.9	0–12.4	0.8	0.0–7.9
Clarification/Discussion of patient's reason(s) for encounter(s)/demand	42	1.4	0–9.9	0.6	0.0–6.3
Other therapeutic procedures/Surgery not elsewhere specified	28	0.9	0–22.7	0.4	0.0–12.6
Physical medicine/Rehabilitation	21	0.7	0–23.7	0.3	0.0–13.1
All treatments	3,081	100.0	n/a	40.8	38.2–43.3

Table 15: Top ten referrals made by GPs in management of cancer

Service or specialist type referred to	Number	Per cent of total referrals		Rate per 100 cancer contacts	
		Rate	95% confidence interval	Rate	95% confidence interval
Dermatologist	366	24.0	17.6–30.4	4.8	0.5–9.1
Surgeon	334	21.9	15.8–28.0	4.4	1.5–7.3
Plastic surgeon	193	12.7	2.7–22.6	2.6	0.0–7.0
Oncologist	96	6.3	0.0–17.3	1.3	0.0–5.9
Urologist	80	5.3	0.0–19.4	1.1	0.0–7.5
Hospital	78	5.1	0.0–18.3	1.0	0.0–7.6
Specialist	64	4.2	0.0–17.9	0.9	0.0–6.2
Health professional not elsewhere specified	33	2.2	0.0–27.0	0.4	0.0–10.1
Gastroenterologist	30	2.0	0.0–21.3	0.4	0.0–12.7
Palliative care	29	1.9	0.0–25.1	0.4	0.0–8.8
All referrals	1,515	100.0	n/a	20.0	18.3–21.8