Cancer incidence and mortality in Western Australia, 2004

A report of the Western Australian Cancer Registry

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Acknowledgments

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Summary

The Western Australian Cancer Registry has since 1981 provided population-based cancer data for use in the planning of health care services and the support of cancer-related research, at both State and Australia-wide levels. Most of this report is concerned with invasive tumours, or "cancers", using standardized reporting practices as used in other cancer registries in Australia and overseas. Sections 2 and 3 of this report deal primarily with cancer incidence and cancer-related mortality in Western Australian residents, who comprise approximately 10% of the Australian population. All statistics are based on the ICDO-3 coding system.

New cases of cancer, 2004
There were 9244 new cases of cancer recorded in Western Australians in 2004, 56% occurring in males. Age-standardized incidence rates were 370 per 100,000 males, and 274 per 100,000 females. The estimated lifetime risk of cancer to age 75 years was 1 in 3 for males, and 1 in 4 for females. These incidence rates and deaths are statistically similar to those reported for 2003.

Cancer-related deaths
Among Western Australian residents, there were 3273 deaths due to cancer in 2004, 56% among males. All-cancers mortality rates for 2004 were 121 deaths per 100,000 males and 82 per 100,000 females. The most common causes of cancer-related death in males were lung, colorectal and prostate cancers, while lung, breast and colorectal cancers were the most common in females.

Common cancers
The most common cancers in males in 2004 were prostate and colorectal cancers, melanoma of the skin, and lung cancer. Breast cancer predominated among females, followed by colorectal cancer, melanoma and lung cancer; these patterns have changed very little in recent years.

There were 56 children under the age of 15 years diagnosed with cancer in 2004 (ASR 16 per 100,000 in males, 14 per 100,000 in females). Cancer at this age is a rare disease and annual variation in numbers and types is considerable. Acute lymphoblastic leukaemia accounted for 27% of the childhood cancers, followed by tumours of the central nervous system (CNS) and neuroblastomas.

Malignant melanoma of the skin was - as in most years since 1982 - the most common cancer in both males and females in the 15-39 years age range. In persons over the age of 40 years, prostate and breast cancers, melanoma, colorectal and lung cancers, remain the most common incident cancers.

Based on data for 2004, one in 8 men would be expected to have a diagnosis of prostate cancer before the age of 75, and 1 in 11 women could be expected to develop breast cancer. One in 116 men could be expected to die from prostate cancer before age 75, and one in 62 women to die from breast cancer.

Historical trends and projections of incidence rates
Historical trends in incidence rates have been updated for all cancers combined, with projections to the year 2014. On the basis of recent years, a stable or slightly-declining cancer incidence is projected, for both males and females.

Age distribution of cancer cases

Cancer is most commonly a disease seen in older people, however patterns vary between cancer types, and changes over time may differ for different types of cancer. While lung cancer rates are decreasing among males of all ages, in females, rates are steady in the youngest ages but increasing in women over 70 years of age.

Cancer notification system and use of alternative data sources

Two projects undertaken within the WA Cancer Registry in the last 12 months have contributed to major sections of this report, dealing with the possible use of coded hospital information about cancers, to supplement the usual notification sources. It has been determined that such information cannot be relied upon without confirmation, and that data quality and relevance varies with cancer type. The recommendations arising from these investigations include the routine use of systematic follow-up which, where resources permit, would contribute significantly to the completeness and comparability of Western Australian cancer incidence data.

1 Overview and Methods

1.1 This Report

Overview of this report

This is the latest in this Registry's series of annual all-cancers incidence and mortality reports, and comprises a summary of Registry activities and topical issues, and details of cancer incidence and mortality for 2004. Sections concerning coding and other Registry practices and statistical methods include relevant material for recent years. This year, a major part of the report is devoted to issues concerning the possible use of coded hospital discharge records to complement actively-notified cancer cases.

The Western Australian Cancer Registry (WACR) is a population-based cancer registry that was established in 1981. Records are based on notification of cancers from pathologists, haematologists and radiation oncologists, and cancer information from death records. The Registry works to collect and disseminate reliable population-based cancer data to assist in the planning of services and in the prevention and treatment of cancer. The **WA Mesothelioma Register** is a separate database maintained within the WACR and reconciled frequently with "mainstream" WACR data. It incorporates specific information for mesothelioma cases, relating to occupational, residential and asbestos exposure history, and the presumed most significant asbestos exposure.

The WACR acts with the delegated authority of the Executive Director of Public Health with respect to the Health (Notification of Cancer) Regulations 1981. Last amended in 1996, these require the notification of *in situ* neoplasms and all non-melanoma skin cancers other than basal cell and squamous cell carcinomas, and all other invasive malignancies and benign CNS tumours (see Appendix 2E). Further changes are currently being sought in order to maintain the relevance of the registry's data collection. A Discussion Paper concerning proposed changes can be found on the Registry website at www.health.wa.gov.au/wacr/

1.2 General structure; how to find information

The major statistical sections are based on cancers diagnosed, and deaths due to cancer, in 2004. Data for the more common forms of cancer are presented under headings based on incidence, mortality and age, while data for common cancers in selected geographic areas are presented in Appendices 3D and 3E. Special topics in Sections 3 -5, may be based on data from other years as well. Detailed data for all types of cancers for 2004 are found in the tables of Appendices 3A and 3B. The layout of those tables follows the coding system summarized in Appendix 2F. Readers seeking detailed information for a particular cancer type which does not appear among the tables of more common cancers, should refer to Appendix 2H.

1.3 Interpretation of changes and differences

Western Australia is particularly polarized into metropolitan and rural areas, and there are likely to be some statistical biases due to the difficulties of transport and the location of services within the State. Throughout this report, an awareness is needed that assessing the importance of changes in cancer incidence and mortality is complex and depends on the underlying population sizes and their age structures. As in previous years, caution is required in assessing changes on the basis of single rate comparisons.

The Cancer Registry database is dynamic, and data are continually updated in the light of the most recent available information. Accordingly, numbers in this report for previous years may vary slightly from those in previous publications. Ongoing reconciliation processes result in some Western Australian cases being found to have been diagnosed elsewhere, or in earlier years, and case-counts necessarily rise and fall as new information arrives. As a guide, while total cancers for 2003 were quoted at 8653 in our previous report,[1] the total currently recorded for 2003 is 8812, an increase of 1.8% (the corresponding figure for 2002 data reported in the 2003 report was 2%, and is indicative of a general level of data evolution with time).

1.4 Statistical methods

Statistics from the Registry commonly fall into one of two major groups: **incidence** is reported for all malignancies except primary squamous cell and basal cell skin cancers (SCC and BCC), and **mortality** for all malignancies and certain other tumours or tumour-like conditions). The usual statistics calculated for both types of report are briefly discussed below; formulae and relevant details are in Appendix 2B.

Rates are calculated separately for males and females, expressed as events (diagnoses or deaths) per 100,000 person-years.
Age-specific rates (ASPR) are based on five-year age intervals and are calculated by dividing the numbers of cases by the population of the same sex and age group.
Age-standardized rates (ASR in Tables) are calculated by the direct method, as a summation of weighted age-specific rates. Tables now show the 95% confidence interval for ASRs, instead of standard deviation (SD). The 95% c.i. is approximately (ASR $\pm$ 1.96 * SD).
When a subset of age groups (e.g. 15-39 years) is considered, the term **age-adjusted rate** is used instead of ASR, as standardization has considered only some age groups, for both cases and population.

The **World Standard Population 1960** [2] remains in routine use for ASR calculation, as in most cancer registries worldwide. However in some tables a second ASR and 95% c.i. are shown, using the Australian (2001)[3] population standard, labelled "ASR2". These ASRs are usually quite different, and comparisons need to take note of which "standard" is being used.

Cumulative Incidence and Lifetime Risk are closely related. **Cumulative incidence** is an estimate of the proportion persons, up to a specific age, who have been affected by a particular condition at some time. In Registry reports, this is expressed as a percentage.
Lifetime risk (LR) estimates the probability of having cancer (incidence) or dying of it (mortality), up to a specific age. This is derived from the relevant cumulative incidence figures, and calculated for ages 0 to 74 years (see **Appendix 2B** for formulae).
In this report, LR is expressed as a "1 in *n*" chance of diagnosis or death. As indicated in relevant tables, a "-" is used to indicate a lack of data (no cases), and a "*" to indicate no data for cases under 75 years of age, or a "risk" smaller than 1 in 10,000.

Person years of life lost (PYLL) is an estimate of the number of years of life lost due to specific causes, calculated to age 75 years; an index of premature death (see Appendix 2B).

Rates and risks: It should be noted that incidence and mortality **rates** and lifetime **risks** may not be in proportion to one another because of differences in the age structures of populations.

2. Cancer in Western Australia, 2004

2.1 All cancers

2.1.1 Incidence

In 2004, there were 9244 new diagnoses of cancer in Western Australia, an apparent increase of 4.9% over a "current" figure for 2003 (8812 cases). There were 5185 cancers diagnosed in males (56%) and 4059 (44%) in females. Corresponding age-standardized incidence rates were 370 per 100,000 (males) and 274 per 100,000 (females), both similar to rates for 2003.

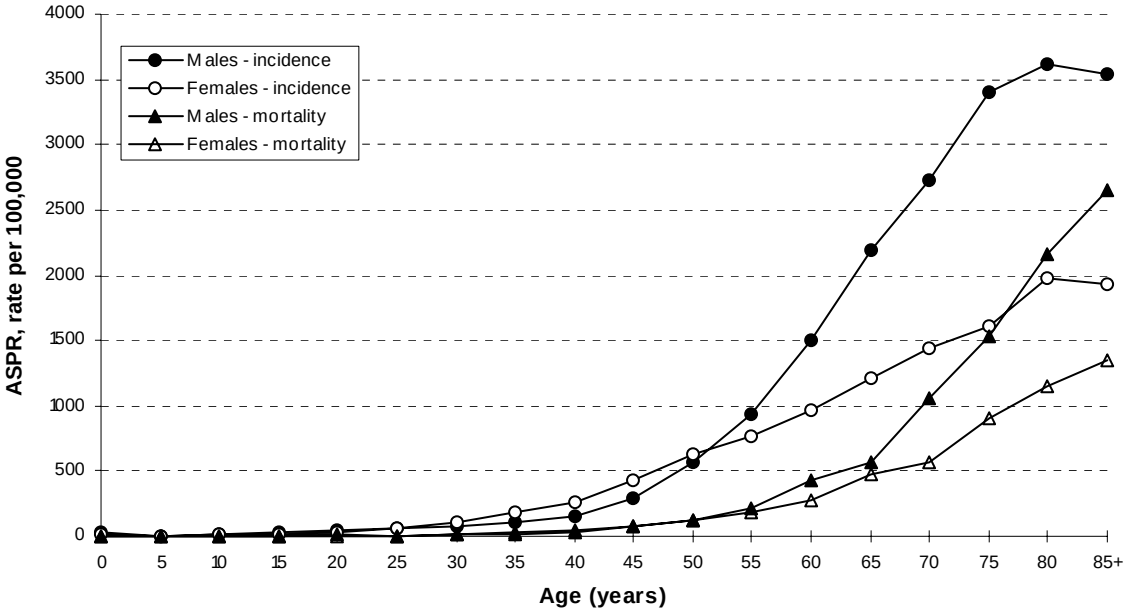
The estimated lifetime risk of cancer to age 75 years was 1 in 3 for males and 1 in 4 for females. The cumulative incidence of cancer - the proportion of persons in whom cancer had been diagnosed by age 75 years - was 43.7% for males, 30.7% for females, both slightly higher than in 2003

In 2004, rates for both sexes aged 15-34 years were similar, followed by a marked predominance of women between 35 and 54 years, and of males at older ages (Figure 1). Differences in the youngest age groups, indistinct on the linear-scale graph, are inconsistent.

Most of the excess cancer risk in females between ages 35 and 50 was due to ovarian and breast cancers, while prostate cancer and lung cancer were responsible for the high male/female rate ratio (approximately 2) at ages over 65 years.

The proportion of all cancers with a microscopic diagnosis was high (95% in males and 94% in females, stable over the last 5 years). Among the most common cancer types, liver cancer was the most often diagnosed by non-histological methods (52% in males and in females). Cancers of unknown primary site and pancreatic cancers were also commonly diagnosed by non-microscopic methods.

Figure 1. Age-specific all-cancers incidence and mortality rates, Western Australia, 2004.



In any year, the WA cancer statistics include a number of cases which began as "hospital data only" records and were confirmed as true cancer cases following attempts to obtain more information. The 2004 data reported here do include a higher than usual number of such cases, due to internal project work reported in Sections 4 and 5 of this report.

2.1.2 Mortality

Among Western Australian residents in 2004, there were 1831 deaths due to cancer in males and 1442 in females, both slightly lower than in 2003 (Table 1). Mortality ASRs were 121 deaths per 100,000 males and 82 per 100,000 females. The estimated lifetime risk of death due to cancer before age 75 years was 1 in 8 for males and 1 in 12 for females. These rates and risks are statistically similar to those for 2003.

These deaths include 29 cases due to non-melanocytic skin cancers of the types (squamous and basal cell carcinomas) that are not included in incidence data (18 males, 11 females; 28 SCCs and one BCC).

In 2004, there were 20 cancer-related deaths in persons not normally resident in Western Australia (12 Australian, 8 from overseas); these are not included in mortality statistics in this report.

Other 2004 deaths recorded by the Cancer Registry included:

Deaths due to benign tumours - none

Deaths due to "uncertain malignant potential" lymphohaematopoietic neoplasms - 1

Deaths due to "uncertain malignant potential" non-lymphohaematopoietic neoplasms - none

Deaths due to non-tumour-related causes among persons with a Registry tumour record - 763 males, 546 females (similar to 2003 numbers)

Deaths of unresolved cause among persons with a tumour record - 30 (19 males, 11 females).

Before the age of 75 years, a total of 12708 person-years of life were lost due to cancer among males and 10813 in females.

There was no significant change in the age-pattern of cancer mortality in 2004. Cancer death rates generally increased for both males and females from age 20 (Fig. 1), with low case numbers at earlier ages. All-cancers death rates among males were consistently higher than in females at ages greater than 55 years.

2.1.3 Mortality to incidence ratios

Except in situations where incidence and/or mortality are changing rapidly, or notification of cancer is incomplete, the ratio of mortality to incidence for a cancer gives a crude indication of its impact. The 2004 mortality/incidence (M/I) rate ratio for prostate cancer was 0.11, decreased since 2003, and the mortality/incidence ratio for breast cancer in females was slightly reduced at 0.17. However, lung cancer has a far higher impact, with 2004 M/I ratios of 0.82 in males and 0.76 in females. All-cancers mortality/incidence ratios for 2004 were higher for males than for females (0.33 and 0.30, both slightly lower than in 2003).

2.2 Common cancers

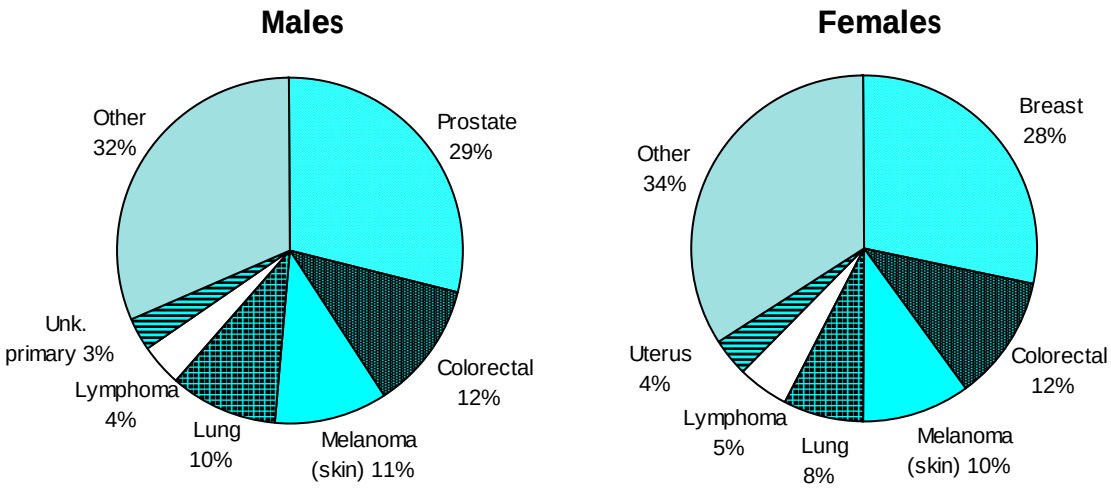
2.2.1 Incidence

In females, breast cancer was the most common incident cancer (1150 cases, 28% of all cancers in females; ASR 83 per 100,000). This was followed by colorectal cancer (12%), melanoma of the skin (10%) and lung cancer (8%). Incidence rates for these most-common cancers in females are unchanged over the last 5 years. There were an additional 182 newly-diagnosed cases of *in situ* breast carcinoma reported, reduced by 15% since 2003.

Most common cancers in males were prostate cancer (1501 cases; 29%), colorectal cancer (612 cases, 12%), melanoma (549 cases; 11%), and lung cancer (521 cases, 10%) (Table 1; Fig. 2). Melanoma incidence among males was reduced approximately 20% since 2003, but there was little change in females. For all the major cancers affecting both males and females, males had a higher incidence than females.

Lymphomas, collectively the next most common cancer in both sexes, accounted for 4-5% of cancers in males and in females, with ASRs of 15 and 13 per 100,000. Cancers of unknown primary site were recorded in 155 males (3% of all cancers, ASR 10) and 116 females (3%, ASR 6).

Figure 2. Cancer incidence, Western Australia, 2004: common cancers



Other common specific cancer types diagnosed included:

Leukaemias - 143 cases in men (ASR 10.9), 88 in women (ASR 6.3)
Bladder - 146 cases in men (ASR 9.8), 41 in women (ASR 1.8)
Kidney - 138 cases in men (ASR 10.4), 85 in women (ASR 5.3)
Stomach - 91 cases in men (ASR 6.0), 58 in women (ASR 2.8)

Other common cancer types in women were uterine cancer (149 cases, ASR 10.1), ovarian cancer (142 cases, ASR 9.9), and cervical cancer (85 cases, ASR 6.6).

2.2.2 Mortality

The most common causes of cancer-related death in males were lung cancer (24%), colorectal cancer (11%) and prostate cancer (11%) (Table 1; Fig. 3). Lung (17%), breast (15%) and colorectal cancer deaths (12%) were the most common in females. In 2000, lung cancer outranked breast cancer as a cause of death among women, however this appeared unusual at that time. In 2003, there were only 4 more deaths due to breast cancer than to lung cancer. While early detection may continue to prevent mortality due to breast cancer, lung cancer remains a significant problem in Western Australian women, returning to first position among causes of cancer death in women in 2004, with 27 more deaths due to lung cancer than breast cancer.

Other major causes of cancer-related mortality included tumours of unknown primary site and pancreas in both sexes, melanoma, lymphomas and stomach cancers in males, and ovarian cancer, brain cancers and lymphomas in females. With minor changes, these results for 2004 are consistent with the usual common causes of cancer-related death in recent years.

Figure 3. Cancer mortality, Western Australia, 2004: common cancers

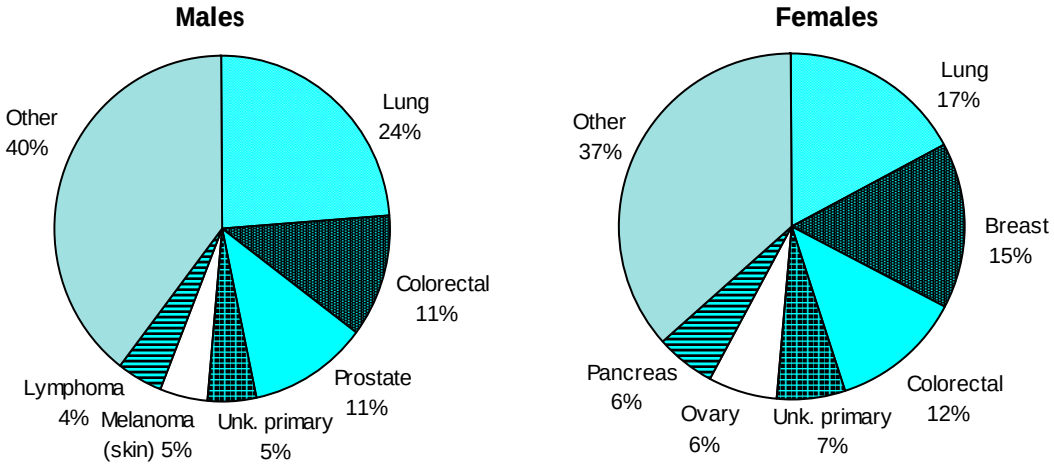


Table 1. Cancer incidence and mortality, Western Australia, 2004: leading types in males and females

Incidence

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**1501**	28.9	**107.4**	102-113	8
Colorectal	**612**	11.8	**42.3**	38.9-45.8	20
Colon	**364**	7.0	**24.9**	22.3-27.6	34
Rectum	**247**	4.8	**17.4**	15.1-19.6	50
Melanoma (skin)	**549**	10.6	**40.4**	37.0-43.9	23
Lung	**521**	10.0	**34.3**	31.2-37.3	25
Lymphoma	**206**	4.0	**14.7**	12.6-16.8	62
Lymphoma NOS	**9**	0.2	**0.5**	0.1-0.9	7006
Hodgkin lymphoma	**21**	0.4	**1.8**	1.0-2.6	540
NHL	**176**	3.4	**12.4**	10.5-14.3	71
Unknown primary	**155**	3.0	**10.1**	8.5-11.8	99
Bladder	**146**	2.8	**9.8**	8.1-11.4	86
Leukaemia	**143**	2.8	**10.9**	9.0-12.8	93
Leukaemia NOS	**1**	0.0	**0.0**	0 - 0.1	*
Lymphoid leukaemia	**86**	1.7	**6.9**	5.3-8.5	135
Myeloid leukaemia	**41**	0.8	**3.1**	2.1-4.1	361
Leukaemia, other	**15**	0.3	**0.9**	0.4-1.3	1721
Kidney	**138**	2.7	**10.4**	8.6-12.2	80
Lip	**101**	1.9	**7.4**	5.9-8.8	120
Oesophagus	**95**	1.8	**6.9**	5.5-8.3	116
Stomach	**91**	1.8	**6.0**	4.7-7.3	157
Pancreas	**80**	1.5	**5.5**	4.2-6.7	151
Testis	**80**	1.5	**7.5**	5.8-9.2	177
Brain	**73**	1.4	**6.1**	4.6-7.7	165
Skin (NMSC exc. SCC/BCC)	**61**	1.2	**4.2**	3.1-5.3	273
Mesothelioma	**60**	1.2	**4.0**	3.0-5.1	205
Myeloma	**59**	1.1	**4.1**	3.0-5.2	196
Liver	**54**	1.0	**3.8**	2.7-4.8	238
Myelodysplastic diseases	**53**	1.0	**3.1**	2.2-4.0	341
All cancers	**5185**	100.0	**370.1**	360-380	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**1150**	28.3	**82.6**	77.7-87.5	11
Colorectal	**477**	11.8	**29.2**	26.3-32.0	30
Colon	**334**	8.2	**19.7**	17.4-22.0	44
Rectum	**141**	3.5	**9.3**	7.7-10.9	89
Melanoma (skin)	**398**	9.8	**29.0**	26.0-31.9	34
Lung	**308**	7.6	**19.1**	16.8-21.4	41
Lymphoma	**192**	4.7	**13.3**	11.3-15.3	66
Lymphoma NOS	**9**	0.2	**0.7**	0.2-1.1	1169
Hodgkin lymphoma	**23**	0.6	**2.2**	1.3-3.1	485
NHL	**160**	3.9	**10.5**	8.8-12.2	82
Uterus	**149**	3.7	**10.1**	8.4-11.8	82
Ovary	**142**	3.5	**9.9**	8.1-11.6	88
Thyroid gland	**117**	2.9	**9.5**	7.8-11.3	100
Unknown primary	**116**	2.9	**6.2**	5.0-7.5	159
Pancreas	**105**	2.6	**6.1**	4.8-7.3	133
Leukaemia	**88**	2.2	**6.3**	4.8-7.9	162
Leukaemia NOS	**0**				
Lymphoid leukaemia	**42**	1.0	**3.4**	2.2-4.6	323
Myeloid leukaemia	**42**	1.0	**2.7**	1.8-3.6	346
Leukaemia, other	**4**	0.1	**0.2**	0 - 0.5	4827
Cervix	**85**	2.1	**6.6**	5.1-8.0	156
Kidney	**85**	2.1	**5.3**	4.1-6.6	173
Lip	**66**	1.6	**4.4**	3.3-5.6	186
Stomach	**58**	1.4	**2.8**	2.0-3.6	460
Myeloma	**50**	1.2	**2.7**	1.9-3.6	301
Brain	**49**	1.2	**3.8**	2.7-5.0	247
Bladder	**41**	1.0	**1.8**	1.2-2.5	570
Oesophagus	**37**	0.9	**2.0**	1.3-2.8	459
Myelodysplastic diseases	**35**	0.9	**1.7**	1.1-2.3	599
All cancers	**4059**	100.0	**274.0**	265-283	4

Mortality

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**438**	23.9	**28.2**	25.5-30.9	30
Colorectal	**208**	11.4	**14.1**	12.1-16.0	64
Colon	**129**	7.0	**8.7**	7.1-10.2	104
Rectum	**79**	4.3	**5.4**	4.1-6.6	163
Prostate	**206**	11.3	**12.1**	10.4-13.8	116
Unknown primary	**87**	4.8	**5.5**	4.3-6.7	199
Melanoma (skin)	**84**	4.6	**5.8**	4.5-7.1	206
Lymphoma	**82**	4.5	**5.4**	4.2-6.6	173
Lymphoma NOS	**2**	0.1	**0.1**	0 - 0.2	*
Hodgkin lymphoma	**11**	0.6	**0.8**	0.3-1.3	809
NHL	**69**	3.8	**4.5**	3.4-5.6	219
Pancreas	**80**	4.4	**5.3**	4.1-6.5	172
Stomach	**75**	4.1	**5.1**	3.9-6.3	171
Oesophagus	**64**	3.5	**4.3**	3.2-5.4	228
Bladder	**57**	3.1	**3.5**	2.6-4.5	334
Mesothelioma	**54**	2.9	**3.6**	2.6-4.6	212
Leukaemia	**54**	2.9	**3.9**	2.8-5.0	273
Leukaemia NOS	**1**	0.1	**0.0**	0 - 0.1	*
Lymphoid leukaemia	**20**	1.1	**1.5**	0.8-2.3	664
Myeloid leukaemia	**26**	1.4	**1.9**	1.2-2.7	497
Leukaemia, other	**7**	0.4	**0.4**	0.1-0.6	6948
Kidney	**48**	2.6	**3.4**	2.4-4.4	248
Brain	**48**	2.6	**3.5**	2.5-4.6	264
Liver	**46**	2.5	**3.2**	2.2-4.2	288
Myelodysplastic diseases	**29**	1.6	**1.6**	1.0-2.2	1093
Myeloma	**28**	1.5	**1.8**	1.1-2.5	378
Skin (not melanoma)	**23**	1.3	**1.5**	0.9-2.1	688
Gallbladder / bile ducts	**19**	1.0	**1.2**	0.6-1.7	910
Larynx	**18**	1.0	**1.1**	0.6-1.6	776
All cancer deaths	**1831**	100.0	**120.8**	115-127	8

Females

	Cases	%	ASR	95%c.i.	Risk
Lung	**250**	17.3	**14.6**	12.7-16.6	57
Breast	**223**	15.5	**14.1**	12.1-16.1	62
Colorectal	**175**	12.1	**9.1**	7.6-10.6	116
Colon	**126**	8.7	**6.4**	5.2-7.7	163
Rectum	**49**	3.4	**2.6**	1.8-3.4	404
Unknown primary	**95**	6.6	**4.6**	3.6-5.7	240
Ovary	**89**	6.2	**5.5**	4.3-6.7	156
Pancreas	**81**	5.6	**4.4**	3.3-5.4	192
Brain	**60**	4.2	**4.4**	3.2-5.6	199
Lymphoma	**57**	4.0	**3.3**	2.4-4.2	259
Lymphoma NOS	**4**	0.3	**0.3**	0 - 0.6	2979
Hodgkin lymphoma	**1**	0.1	**0.1**	0 - 0.2	5817
NHL	**52**	3.6	**2.9**	2.1-3.8	298
Leukaemia	**51**	3.5	**2.8**	2.0-3.7	360
Leukaemia NOS	**4**	0.3	**0.2**	0 - 0.5	3504
Lymphoid leukaemia	**15**	1.0	**0.8**	0.3-1.2	1344
Myeloid leukaemia	**31**	2.1	**1.8**	1.1-2.5	572
Leukaemia, other	**1**	0.1	**0.0**	0 - 0.1	*
Melanoma (skin)	**36**	2.5	**2.4**	1.6-3.3	357
Stomach	**35**	2.4	**1.7**	1.1-2.4	801
Kidney	**35**	2.4	**1.9**	1.2-2.7	454
Myeloma	**34**	2.4	**1.7**	1.1-2.4	537
Uterus	**31**	2.1	**1.6**	0.9-2.2	637
Oesophagus	**24**	1.7	**1.3**	0.8-1.9	606
Gallbladder / bile ducts	**22**	1.5	**1.1**	0.6-1.6	897
Cervix	**22**	1.5	**1.3**	0.7-1.9	840
Myelodysplastic diseases	**20**	1.4	**0.9**	0.4-1.3	1158
Bladder	**18**	1.2	**0.8**	0.4-1.2	1364
Liver	**17**	1.2	**0.8**	0.4-1.2	1364
Skin (not melanoma)	**13**	0.9	**0.5**	0.2-0.8	4597
All cancer deaths	**1442**	100.0	**82.5**	77.8-87.1	12

Notes: - no data; * no data <75 years or risk less than 1 in 10,000

(Refer to Statistical Methods, Section 1.4, for terms & abbreviations used)

2.3 Cancer in different age groups

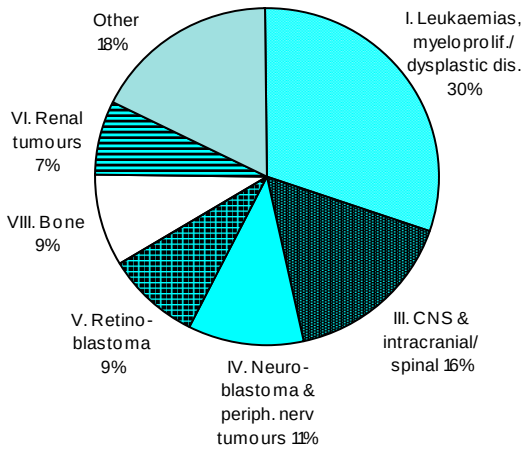
2.3.1 Cancer in children

In children under the age of 15 years, there were 56 cases of cancer diagnosed in 2004, 30 males and 26 females. The corresponding ASRs were 15.9 per 100,000 males, and 14.1 per 100,000 females, both lower than in 2003. (**Appendix 3C**). The estimated 0-14 years population in Western Australia in 2004 was 399,636 children (204,671 males and 194,965 females).

Diagnoses are routinely coded and reported using ICD-O 3rd edition,[4] but are also tabulated using the WHO-sponsored International Classification of Childhood Cancer, into 12 major diagnostic groups based primarily on tumour morphology; these are shown in **Appendix 3C**. This report uses the 3rd revision of this classification.

The most common tumours diagnosed in children in 2004 are shown in Figure 4. The leukaemias accounted for 30% of all diagnoses. Primary central nervous system tumours were the second most common group with 9 cases (5 males, 4 females). The most common individual tumour type was acute lymphoblastic leukaemia, with 15 children newly diagnosed (8 males, 7 females). There were no melanoma cases reported in Western Australian children in 2004.

Figure 4. Cancer in children under 15 years of age, Western Australia, 2004: most common types.



There were 15 cancer-related deaths (10 males, 5 females) in children in 2004, more than in 2003 but the same number as in 2002. Age-adjusted death rates were 4.8 per 100,000 in males and 2.4 per 100,000 in females. The estimated risk of death due to cancer before the age of 15 was 1 in 1369 for males, and 1 in 2657 for females.

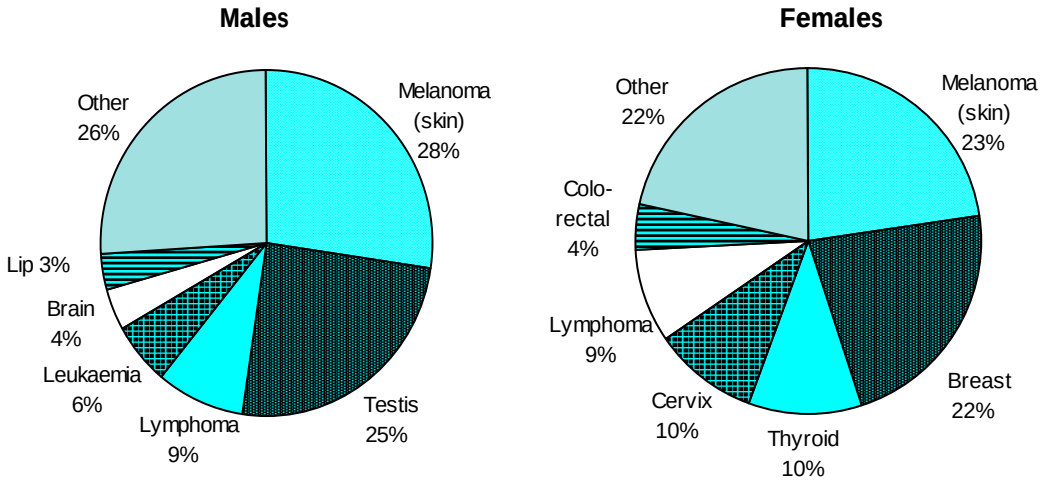
Time trends in childhood cancer incidence

Over the period 1995 to 2004, the all-cancers incidence rate did not change significantly for males or for females under 15 years of age. In males, the annual incidence rate ratio was 1.025 (95% confidence interval 0.985 - 1.067, p = 0.219). In females the annual rate ratio was 0.998 (0.957 - 1.041, p = 0.918).

2.3.2 Cancer in the 15-39 years age range

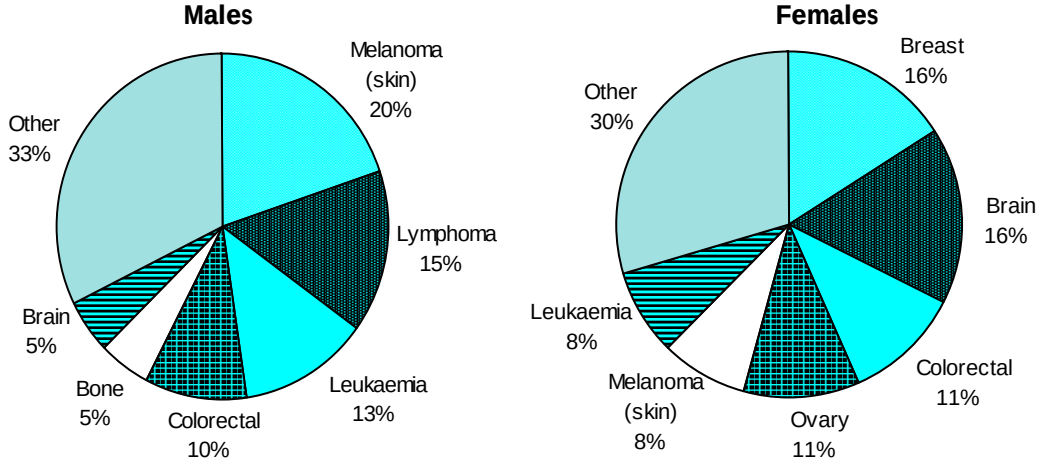
Incidence: In the 15 to 39 years age range, there were 537 cancer diagnoses in 2004 (240 males, ASR 62, 297 females, ASR 74) (Table 2). Melanoma of the skin was most common in both sexes (66 males, 68 females). Second-ranked cancers were testicular cancer in males (59 cases, 25% of all cancers) and breast cancer in females (66 cases, 22% of all cancers) (Fig. 5). Thyroid and cervical cancers were the next most common in females, with lymphoma (21 cases) and leukaemia (14 cases) following next in males. There has been little or no change in this pattern of most common cancer types in this age range in recent years.

Figure 5. Cancer incidence, Western Australia, 2004: common cancers in the 15 to 39 years age group



Mortality: Among persons aged 15 to 39 years, there were 77 cancer-related deaths in 2004, 40 in males and 37 in females (Table 3). Among males, melanoma, lymphoma and leukaemia were the leading causes of cancer-related death in this age group (Fig. 6). In females, breast and brain cancers were the leading causes of cancer death (each responsible for 6 deaths and 16% of all cancer deaths in females), followed by colorectal and ovarian cancer deaths (4 of each). As cancer-related death in this age group is relatively uncommon, these 'rankings' remain very variable from year to year.

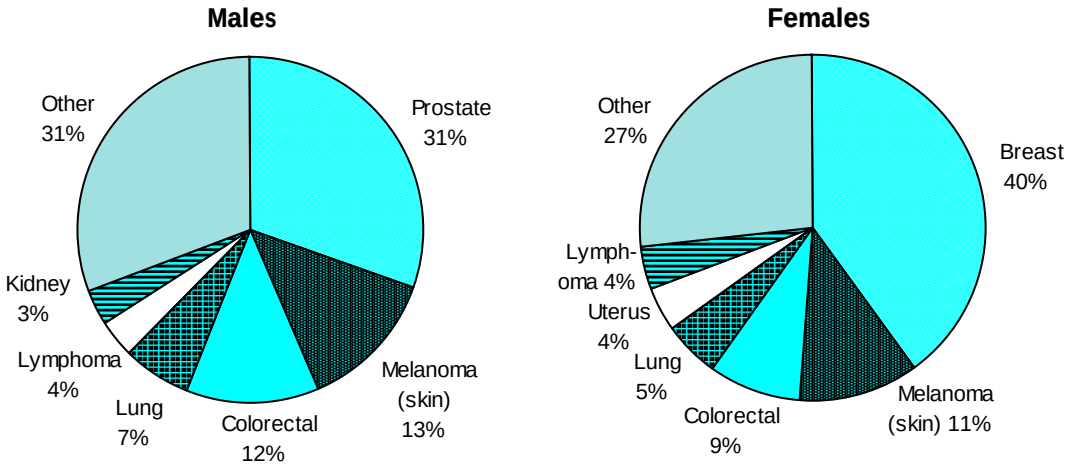
Figure 6. Cancer mortality, Western Australia, 2004: common cancers in the 15 to 39 years age group



2.3.3 Cancer in the 40-64 years age range

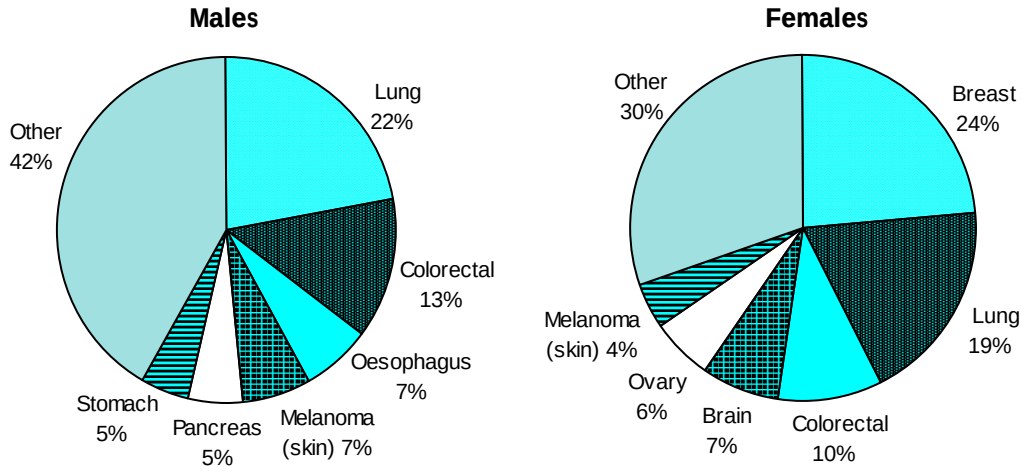
Incidence: In the age range 40 to 64 years, breast cancer continued to dominate reported incident cancers (709 cases, 40% of all female cancers in this age group, little-changed in the last 3 years) (Table 2; Fig. 7). The risk of cancer occurring in this age range was 1 in 6 for males, and 1 in 7 for females. More cancers occurred in males (52 %) than in females, with prostate cancer (31%), melanoma (13%) and colorectal cancer (12%) being the most common. In females, melanoma (11%) and colorectal cancer (9%) were the most common after breast cancer.

Figure 7. Cancer incidence, Western Australia, 2004: common cancers in the 40 to 64 years age group



Mortality: In 2004, in the age range 40 to 64 years, lung cancer was, as in 2002 and 2003, the most common cause of cancer-related death in males (106 deaths, age-adjusted rate of 33 per 100,000 males; little change since 2001) (Table 3; Figure 8). Other leading causes of death in males were colorectal cancer (62 deaths), oesophageal cancer (31 deaths) and melanoma (31 deaths). Major causes among females were breast cancer (91 deaths), lung cancer (72 deaths) and colorectal cancer (37 deaths). Cancers of unknown primary site were less common among causes of death in this age range, than in recent years.

Figure 8. Cancer mortality, Western Australia, 2004: common cancers in the 40 to 64 years age group

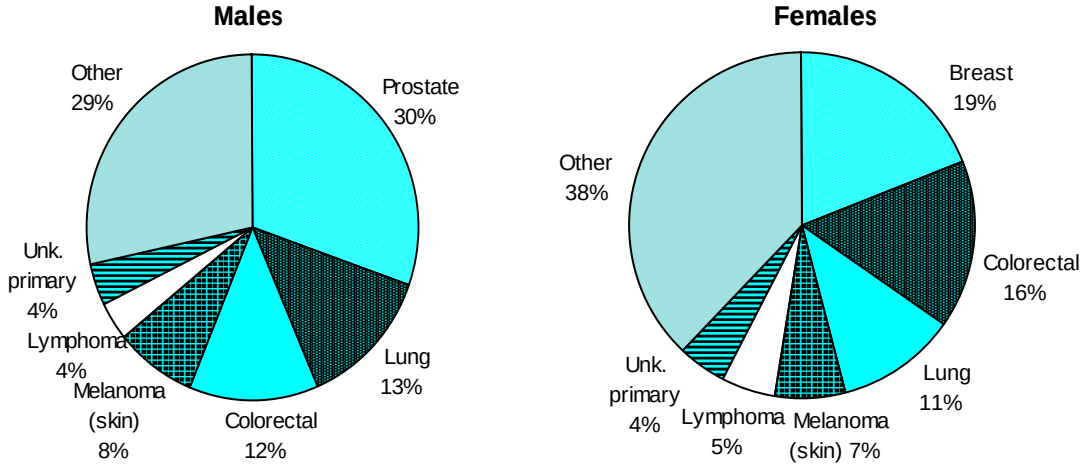


2.3.4 Cancer in persons aged 65 and over

Incidence: Over the age of 65 years, prostate cancer (907 cases) outnumbered any other specific cancer type in either sex (Table 2; Fig. 9) and accounted for 30% of diagnoses in males. Although rates have fluctuated markedly the last 20 years, rates have been increasing in recent years. Among females, breast cancer predominated (375 cases, 19%).

Other common cancer types in this age range were colorectal cancer (12% in males, 16% in females) and lung cancer (13%, 11%). These proportions have been relatively stable over recent years. Melanoma of the skin was the fourth most common cancer type in males (8%) and in females (7%). Lymphomas were the fifth most common grouping in both sexes.

Figure 9. Cancer incidence, Western Australia, 2004: common cancers in the 65 years & over age group



Mortality: Over the age of 65 years, lung cancer was, as in recent years, the most common cause of cancer-related death in both sexes. Among males, lung cancer caused 331 deaths, at an age-adjusted rate 283 per 100,000; 25% of cancer-related deaths. Among females, it was responsible for 177 deaths at 124 per 100,000, 17% of all cancer deaths. Colorectal cancer ranked third in males (142 deaths, 11%) and second in females (134 deaths, 13%). Deaths due to prostate cancer ranked second in males (185 deaths, 14%). Breast cancer was the third most common cause of cancer-related death in females (126 deaths, 12%). Cancers of unknown primary site were a major cause of death in this age range (147 deaths), being the fourth most common cause of cancer-related death in both sexes (Figure 10).

Figure 10. Cancer mortality, Western Australia, 2004: common cancers in the 65 years & over age group

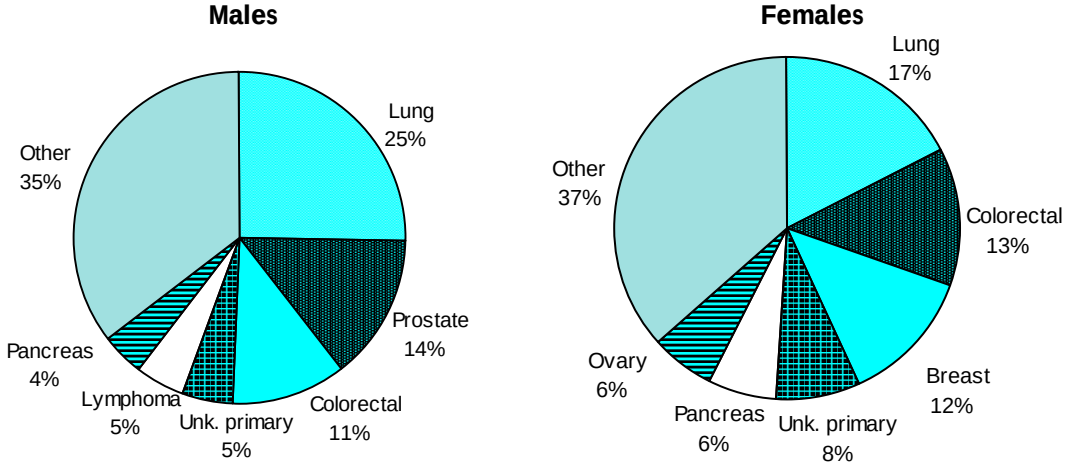


Table 2. Cancer incidence, Western Australia, 2004: leading types by sex and age group (ASR: age-adjusted rate)

15 to 39 years

Males	Cases	%	ASR	95%c.i.	Risk
Melanoma (skin)	**66**	27.5	**16.2**	12.2-20.2	221
Testis	**59**	24.6	**15.9**	11.8-20.0	244
Lymphoma	**21**	8.8	**5.5**	3.1-7.8	690
Lymphoma NOS	**1**	0.4	**0.3**	0 - 0.9	*
Hodgkin lymphoma	**9**	3.8	**2.4**	0.8-3.9	1603
NHL	**11**	4.6	**2.8**	1.1-4.5	1328
Leukaemia	**14**	5.8	**3.8**	1.8-5.8	1046
Leukaemia NOS	**0**				
Lymphoid leukaemia	**3**	1.3	**0.8**	0 - 1.8	4879
Myeloid leukaemia	**11**	4.6	**2.9**	1.2-4.7	1332
Leukaemia, other	**0**				
Brain	**9**	3.8	**2.6**	0.9-4.3	1625
Lip	**8**	3.3	**1.9**	0.6-3.3	1846
Thyroid gland	**8**	3.3	**2.3**	0.7-4.0	1761
Colorectal	**6**	2.5	**1.4**	0.3-2.5	2433
All cancers	**240**	100.0	**61.9**	53.9-69.9	61

Females	Cases	%	ASR	95%c.i.	Risk
Melanoma (skin)	**68**	22.9	**17.0**	12.9-21.1	211
Breast	**66**	22.2	**15.1**	11.5-18.8	221
Thyroid gland	**31**	10.4	**8.1**	5.2-11.1	457
Cervix	**29**	9.8	**7.1**	4.5-9.7	495
Lymphoma	**26**	8.8	**7.2**	4.4-10.1	543
Lymphoma NOS	**1**	0.3	**0.2**	0 - 0.7	*
Hodgkin lymphoma	**14**	4.7	**4.1**	1.9-6.3	997
NHL	**11**	3.7	**2.9**	1.2-4.7	1298
Colorectal	**13**	4.4	**3.4**	1.5-5.2	1096
Colon	**10**	3.4	**2.6**	1.0-4.2	1429
Rectum	**3**	1.0	**0.8**	0 - 1.7	4704
Ovary	**11**	3.7	**3.0**	1.2-4.7	1272
Lip	**7**	2.4	**1.9**	0.5-3.3	1995
All cancers	**297**	100.0	**74.5**	65.8-83.1	49

40 to 64 years

Males	Cases	%	ASR	95%c.i.	Risk
Prostate	**593**	30.6	**185.9**	171-201	19
Melanoma (skin)	**250**	12.9	**78.6**	68.8-88.4	47
Colorectal	**238**	12.3	**74.9**	65.4-84.5	48
Colon	**127**	6.6	**39.8**	32.8-46.8	89
Rectum	**111**	5.7	**35.1**	28.5-41.7	102
Lung	**126**	6.5	**40.3**	33.2-47.4	85
Lymphoma	**70**	3.6	**21.7**	16.6-26.8	175
Lymphoma NOS	**1**	0.1	**0.3**	0 - 1.0	*
Hodgkin lymphoma	**9**	0.5	**2.9**	1.0-4.8	1399
NHL	**60**	3.1	**18.5**	13.8-23.2	203
Kidney	**61**	3.1	**19.8**	14.8-24.8	179
Lip	**52**	2.7	**16.1**	11.7-20.5	237
Leukaemia	**42**	2.2	**13.0**	9.1-17.0	275
All cancers	**1937**	100.0	**609.7**	582-637	6

Females	Cases	%	ASR	95%c.i.	Risk
Breast	**709**	39.9	**223.9**	207-240	18
Melanoma (skin)	**198**	11.1	**62.8**	54.0-71.6	61
Colorectal	**157**	8.8	**51.0**	43.0-59.1	70
Colon	**95**	5.3	**30.8**	24.5-37.0	114
Rectum	**60**	3.4	**19.6**	14.6-24.6	184
Lung	**90**	5.1	**29.1**	23.1-35.2	122
Uterus	**76**	4.3	**23.9**	18.5-29.3	150
Lymphoma	**69**	3.9	**22.2**	17.0-27.5	167
Lymphoma NOS	**3**	0.2	**1.1**	0 - 2.3	3324
Hodgkin lymphoma	**2**	0.1	**0.6**	0 - 1.5	6427
NHL	**64**	3.6	**20.6**	15.5-25.6	181
Ovary	**66**	3.7	**21.1**	16.0-26.2	174
Thyroid gland	**65**	3.7	**20.4**	15.4-25.4	197
Cervix	**37**	2.1	**11.8**	8.0-15.6	340
Kidney	**29**	1.6	**9.4**	5.9-12.8	398
All cancers	**1778**	100.0	**566.8**	540-593	7

65 years and over

Males	Cases	%	ASR	95%c.i.	Risk
Prostate	**907**	30.4	**869.8**	811-928	12
Lung	**393**	13.2	**342.8**	308-378	35
Colorectal	**368**	12.4	**329.7**	295-365	35
Colon	**236**	7.9	**212.8**	185-241	54
Rectum	**131**	4.4	**116.3**	95.5-137	99
Melanoma (skin)	**233**	7.8	**211.4**	183-240	56
Lymphoma	**113**	3.8	**100.3**	81.0-120	113
Lymphoma NOS	**7**	0.2	**4.2**	1.1-7.3	*
Hodgkin lymphoma	**3**	0.1	**3.3**	0 - 7.1	1946
NHL	**103**	3.5	**92.8**	74.1-111	119
Unknown primary	**111**	3.7	**93.9**	75.7-112	160
Bladder	**110**	3.7	**96.3**	77.6-115	121
Leukaemia	**78**	2.6	**69.3**	53.3-85.3	182
Leukaemia NOS	**1**	0.0	**0.7**	0 - 2.0	*
All cancers	**2979**	100.0	**2713.8**	2614-2814	5

Females	Cases	%	ASR	95%c.i.	Risk
Breast	**375**	19.2	**300.4**	267-334	33
Colorectal	**307**	15.7	**216.9**	190-244	53
Colon	**229**	11.7	**158.0**	135-181	76
Rectum	**78**	4.0	**58.9**	44.6-73.3	178
Lung	**216**	11.0	**166.7**	143-191	62
Melanoma (skin)	**132**	6.7	**99.5**	80.9-118	114
Lymphoma	**96**	4.9	**70.8**	55.3-86.3	139
Lymphoma NOS	**5**	0.3	**4.3**	0.4-8.3	2056
Hodgkin lymphoma	**6**	0.3	**5.5**	0.9-10.1	1205
NHL	**85**	4.3	**61.0**	46.7-75.3	169
Unknown primary	**85**	4.3	**52.0**	39.7-64.3	287
Pancreas	**77**	3.9	**53.2**	40.0-66.4	211
Uterus	**70**	3.6	**56.1**	41.9-70.4	186
Ovary	**65**	3.3	**49.8**	36.6-63.1	206
All cancers	**1958**	100.0	**1434.4**	1365-1504	8

Notes: - no data; * no data <75 years or risk less than 1 in 10,000

Table 3. Cancer mortality, Western Australia, 2004: leading types by sex and age group (ASR: age-adjusted rate)

15 to 39 years

Males	Deaths	%	ASR	95%c.i.	Risk
Melanoma (skin)	**8**	20.0	**2.2**	0.6-3.7	1809
Lymphoma	**6**	15.0	**1.6**	0.3-2.9	2459
Lymphoma NOS	**0**				-
Hodgkin lymphoma	**2**	5.0	**0.4**	0 - 1.0	7451
NHL	**4**	10.0	**1.2**	0.0-2.3	3671
Leukaemia	**5**	12.5	**1.4**	0.2-2.6	2890
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**2**	5.0	**0.5**	0 - 1.3	7088
Myeloid leukaemia	**3**	7.5	**0.8**	0 - 1.8	4879
Leukaemia, other	**0**				-
Colorectal	**4**	10.0	**0.9**	0.0-1.7	3708
Colon	**2**	5.0	**0.4**	0 - 1.0	7381
Rectum	**2**	5.0	**0.4**	0 - 1.0	7451
Bone	**2**	5.0	**0.5**	0 - 1.3	7430
Brain	**2**	5.0	**0.4**	0 - 1.0	7381
All cancer deaths	**40**	100.0	**10.3**	7.1-13.6	364

Females	Deaths	%	ASR	95%c.i.	Risk
Breast	**6**	16.2	**1.3**	0.3-2.4	2444
Brain	**6**	16.2	**1.7**	0.3-3.0	2338
Colorectal	**4**	10.8	**0.9**	0.0-1.8	3665
Colon	**2**	5.4	**0.4**	0 - 1.1	7330
Rectum	**2**	5.4	**0.4**	0 - 1.1	7330
Ovary	**4**	10.8	**1.0**	0.0-2.0	3563
Melanoma (skin)	**3**	8.1	**0.8**	0 - 1.7	4704
Leukaemia	**3**	8.1	**0.8**	0 - 1.7	4825
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**1**	2.7	**0.2**	0 - 0.7	*
Myeloid leukaemia	**2**	5.4	**0.6**	0 - 1.4	7191
Leukaemia, other	**0**				-
Stomach	**2**	5.4	**0.4**	0 - 1.1	7332
Cervix	**2**	5.4	**0.6**	0 - 1.4	7191
Unknown primary	**2**	5.4	**0.7**	0 - 1.6	6802
All cancer deaths	**37**	100.0	**9.3**	6.3-12.4	388

40 to 64 years

Males	Deaths	%	ASR	95%c.i.	Risk
Lung	**106**	22.3	**33.3**	26.9-39.6	103
Colorectal	**62**	13.0	**20.2**	15.1-25.3	170
Colon	**30**	6.3	**10.0**	6.4-13.6	344
Rectum	**32**	6.7	**10.2**	6.6-13.7	335
Oesophagus	**31**	6.5	**9.8**	6.3-13.3	354
Melanoma (skin)	**31**	6.5	**9.7**	6.3-13.2	381
Pancreas	**25**	5.3	**8.0**	4.8-11.2	440
Stomach	**22**	4.6	**7.5**	4.3-10.6	447
Prostate	**21**	4.4	**7.0**	4.0-10.1	467
Kidney	**21**	4.4	**6.9**	3.9-9.9	510
Brain	**21**	4.4	**6.5**	3.7-9.3	610
Unknown primary	**19**	4.0	**5.9**	3.2-8.5	628
Liver	**17**	3.6	**5.5**	2.9-8.1	647
Mesothelioma	**17**	3.6	**5.4**	2.8-8.0	641
Lymphoma	**15**	3.2	**4.8**	2.3-7.2	775
All cancer deaths	**476**	100.0	**151.8**	138-166	24

Females	Deaths	%	ASR	95%c.i.	Risk
Breast	**91**	23.7	**29.2**	23.2-35.3	128
Lung	**72**	18.8	**23.4**	18.0-28.9	148
Colorectal	**37**	9.6	**11.9**	8.0-15.8	308
Colon	**27**	7.0	**8.7**	5.4-12.0	413
Rectum	**10**	2.6	**3.2**	1.2-5.2	1211
Brain	**28**	7.3	**8.8**	5.5-12.0	420
Ovary	**23**	6.0	**7.7**	4.5-10.8	457
Melanoma (skin)	**16**	4.2	**5.3**	2.7-7.9	705
Pancreas	**15**	3.9	**4.8**	2.4-7.3	716
Unknown primary	**14**	3.6	**4.7**	2.2-7.2	763
Lymphoma	**14**	3.6	**4.4**	2.1-6.7	897
Lymphoma NOS	**2**	0.5	**0.7**	0 - 1.6	5181
Hodgkin lymphoma	**0**				-
NHL	**12**	3.1	**3.7**	1.6-5.8	1085
Cervix	**9**	2.3	**2.8**	0.9-4.6	1356
Kidney	**8**	2.1	**2.6**	0.8-4.4	1364
All cancer deaths	**384**	100.0	**124.0**	112-136	30

65 years and over

Males	Deaths	%	ASR	95%c.i.	Risk
Lung	**331**	25.4	**283.0**	251-315	43
Prostate	**185**	14.2	**147.8**	126-170	155
Colorectal	**142**	10.9	**124.2**	103-145	104
Colon	**97**	7.4	**86.0**	68.2-104	151
Rectum	**45**	3.4	**38.2**	26.5-49.8	329
Unknown primary	**68**	5.2	**57.7**	43.4-71.9	292
Lymphoma	**61**	4.7	**51.7**	38.2-65.2	244
Lymphoma NOS	**2**	0.2	**1.4**	0 - 3.5	*
Hodgkin lymphoma	**7**	0.5	**6.6**	1.6-11.6	1081
NHL	**52**	4.0	**43.6**	31.3-56.0	314
Pancreas	**55**	4.2	**47.1**	34.2-60.0	282
Stomach	**52**	4.0	**44.6**	32.0-57.2	282
Bladder	**49**	3.8	**40.9**	29.1-52.7	447
Melanoma (skin)	**45**	3.4	**36.4**	25.4-47.4	594
Leukaemia	**38**	2.9	**32.3**	21.6-43.0	427
All cancer deaths	**1305**	100.0	**1107.3**	1045-1169	13

Females	Deaths	%	ASR	95%c.i.	Risk
Lung	**177**	17.4	**123.9**	104-144	93
Colorectal	**134**	13.2	**82.5**	66.9-98.1	196
Colon	**97**	9.5	**58.6**	45.6-71.6	278
Rectum	**37**	3.6	**23.9**	15.3-32.5	661
Breast	**126**	12.4	**90.2**	72.7-108	126
Unknown primary	**79**	7.8	**45.9**	34.7-57.1	368
Pancreas	**66**	6.5	**45.2**	33.2-57.2	261
Ovary	**62**	6.1	**46.0**	33.3-58.7	254
Lymphoma	**42**	4.1	**30.0**	20.0-40.0	372
Lymphoma NOS	**2**	0.2	**1.8**	0 - 4.4	7007
Hodgkin lymphoma	**1**	0.1	**1.0**	0 - 2.9	5817
NHL	**39**	3.8	**27.2**	17.8-36.6	422
Leukaemia	**40**	3.9	**26.5**	17.4-35.6	539
All cancer deaths	**1016**	100.0	**675.5**	630-722	20

Notes: - no data; * no data <75 years or risk less than 1 in 10,000

3. Cancer in Western Australia: special topics

3.1 Death Certificate Only cancers

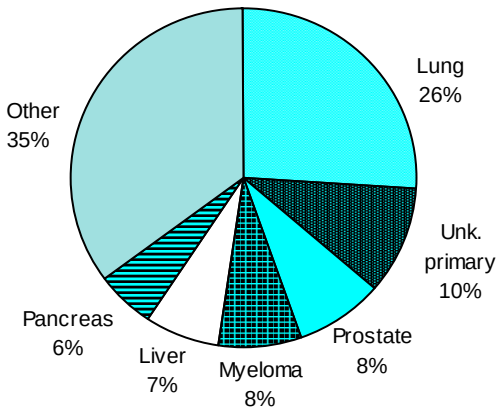
"Death certificate only" (DCO) cancers are those for which no information other than a death certificate is available to the WACR. Having a low proportion of DCO cases is widely regarded as an important index of data quality in a Cancer Registry. In Western Australia, there were 17 DCO cancers recorded for 2004, representing only 0.2% of all cancers (as in 2003).

The Registry continues to use computerized hospital discharge data to eliminate some letter-based enquiries, where the data are in agreement. There were 87 such "DC and HMDS" cases (0.9%) recorded for 2004 on the basis of a death certificate and a coded hospital discharge record alone, with the date of diagnosis taken from the hospital discharge date.

These cases were less common than for 2003, reflecting a combination of better response to routine enquiries, and continuing active monitoring of the electronic pathology notification systems. Most common types were cancers of the lung (23 cases), cancers of unknown primary site (9), myeloma and prostate (7 each) and liver cancer (6). These are shown as "DC & HMDS" cases in Fig. 11 below.

As the discharge data lack a true diagnosis date or address at diagnosis, and basis of diagnosis, these data are treated as being less reliable than those sourced from clinical notes and pathology reports. However, the process appears cost-effective in improving timeliness. As noted in our recent reports, an audit was needed - and has been conducted during 2005 (see Section 5).

Figure 11. "DC & HMDS" cancers, 2004: common types



3.2 Revised projections of cancer incidence

3.2.1 Need for projections

There have been many influences which combine to make projections of cancer case numbers and rates somewhat unreliable, as discussed in previous reports. However, such projections are often requested for health service planning reasons, and are presented here as the best available basis for prediction of future need for medical services. These do not take into account unknown changes in risk factors or diagnostic practices, and can be adversely affected by past events, and should be used with some caution.

3.2.2 Methods

Using an exponentially-weighted moving average method as described in *Cancer incidence and mortality in Western Australia 2002*,[5] updated projections for "All cancers" have been revised and are presented here in Table 4. Time trend assessment has been conducted using Poisson regression for the calculation of a rate ratio and 95% confidence interval.

3.2.3 Time trends 1995-2004

The incidence rates for all cancers combined have increased during the period 1995-2004 by an average of 0.12% per year for males, and by 0.31% per year for females. Neither of these represents a statistically-significant trend. Accordingly, when examining the increasing projected case numbers in Table 4, one should be aware that the bulk of the increase is due to population growth, and not to any increase in the risk of being diagnosed as having cancer.

3.2.4 Newest projections: "all cancers"

Males: On the basis of recent years, a decline in cancer incidence is projected, from an ASR of 370 cases per 100,000 in 2004, to 365 per 100,000 by 2009 (Table 4). However, excessive numbers of prostate cancers marked the beginning of this time period, and data for the most recent years suggest that increases in rates will occur again.

Females: On the basis of recent years, incidence in females is expected to remain constant, changing only from an ASR of 274 per 100,000 to 273 per 100,000 by 2009 (Table 4).

These projections have been relatively stable in recent years, but have been far more variable for males than for females. In the Registry's last published report, the total cancer case estimates for 2008 were 5280 (males) and 4391 (females). One year later, the current estimates for 2008 are 5721 (males) and 4410 (females), increases of 8% and 0.4% respectively. Reliance on any mathematical procedure (in isolation from knowledge of changes in medical practice) is risky, and it is likely that the stability of male cancer projections is still being affected by the apparent doubling (and then halving) of prostate cancer incidence in the early 1990s.

Table 4. Cancer incidence, Western Australia, 1982-2004, and projections to 2014: all cancers

	MALES				FEMALES			
Year	**Cases**	95% c.i.	**ASR**	95% c.i.	**Cases**	95% c.i.	**ASR**	95% c.i.
1982	**2066**		**296**	283-309	**1832**		**240**	229-251
1983	**2079**		**285**	273-298	**1836**		**233**	222-244
1984	**2134**		**284**	272-296	**1851**		**225**	215-236
1985	**2431**		**315**	303-328	**2091**		**245**	234-256
1986	**2492**		**308**	296-320	**2152**		**244**	233-254
1987	**2638**		**316**	304-328	**2255**		**246**	235-256
1988	**2691**		**315**	303-327	**2403**		**251**	241-262
1989	**2713**		**307**	295-319	**2476**		**254**	243-264
1990	**2842**		**312**	300-323	**2483**		**250**	240-260
1991	**3069**		**325**	313-336	**2627**		**254**	244-264
1992	**3223**		**333**	321-344	**2778**		**262**	252-272
1993	**3675**		**369**	357-381	**2819**		**260**	250-270
1994	**4258**		**420**	407-432	**2950**		**267**	256-277
1995	**4099**		**397**	384-409	**3242**		**286**	275-296
1996	**3923**		**365**	354-377	**3058**		**259**	250-269
1997	**3579**		**321**	310-331	**3129**		**258**	248-267
1998	**3666**		**317**	307-328	**3191**		**253**	244-263
1999	**4210**		**353**	342-363	**3412**		**263**	254-273
2000	**4193**		**341**	330-351	**3428**		**259**	250-269
2001	**4285**		**337**	327-347	**3644**		**263**	254-272
2002	**4796**		**365**	355-376	**3905**		**277**	268-286
2003	**4876**		**360**	349-370	**3936**		**272**	263-281
2004	**5185**		**370**	360-380	**4059**		**274**	265-283
2005	**5097**	5026-5168	**353**	343-363	**4034**	3945-4123	**267**	258-275
2006	**5297**	5225-5369	**356**	346-366	**4155**	4064-4247	**268**	259-277
2007	**5509**	5435-5582	**359**	349-369	**4282**	4189-4375	**270**	261-278
2008	**5721**	5647-5796	**362**	352-372	**4410**	4315-4504	**271**	263-280
2009	**5944**	5868-6020	**365**	356-375	**4541**	4445-4637	**273**	264-281
2014	**7185**	7102-7268	**380**	371-389	**5263**	5160-5367	**280**	272-288

Trend 1995-2004: Increase by 0.12% per year (not significant)

Trend 1995-2004: Increase by 0.31% per year (not significant)

3.3 Impact of coding scheme changes on cancer data: update

As stated in our report for 2002,[5] for consistency with the ICD-O coding system, several conditions are now tabulated as "cancers", including polycythaemia rubra vera, refractory anaemias and myelodysplastic syndromes. The reporting of persons with leukaemia, with a prior diagnosis of one of these new "cancers", may be problematic for Registries without access to historical records.

Reporting rules promoted by the International Association of Cancer Registries (IACR) have been discussed but may not yet have been implemented Australia-wide. In WACR databases, some aspects of the current IACR rules have been implemented. At the time of writing, in addition to the 231 leukaemias reported for 2004 (Table 1) there were 40 further leukaemias not "counted" due to a prior myelodysplasia or similar condition, which is reported separately (although it may be in an earlier year).

One change remaining to be implemented, is a full adherence to the "multiple primary" tumour reporting rules for the ICDO-3 coding system. This is anticipated for the Registry's next report, and for other State and Territory registries and in "Cancer in Australia" publications in due course.

In summary, changes due to the revised system are expected to include:

- Lip, gum and mouth C00 - C06 (excluding tongue, C01/C02) to be treated as one site
- Parotid / major salivary glands C07 / C08 to be treated as separate sites
- Pharynx C09 - C14 (excluding Nasopharynx C11) to be treated as one site
- Vulva / vagina C51 / C52 once again to be treated as separate sites
- Ovary / Uterine adnexa C56 / C57 once again to be treated as separate sites
- Male genital C60 - C63 to be treated as separate sites (including prostate C61 and testis C62, as previously)
- Bladder and other urinary tract C65 - C68 to be treated as one "site"; ending the special treatment of "Bladder" (C67) in this regard
- Recognition of the validity of reporting both a Hodgkin lymphoma and non-Hodgkin lymphoma in the same person.

A further change anticipated is the adoption of the practice of the International Agency for Research on Cancer (IARC) in disregarding basal-cell carcinomas of the lip, treating them as (non-reportable) carcinomas of the skin of the lip.

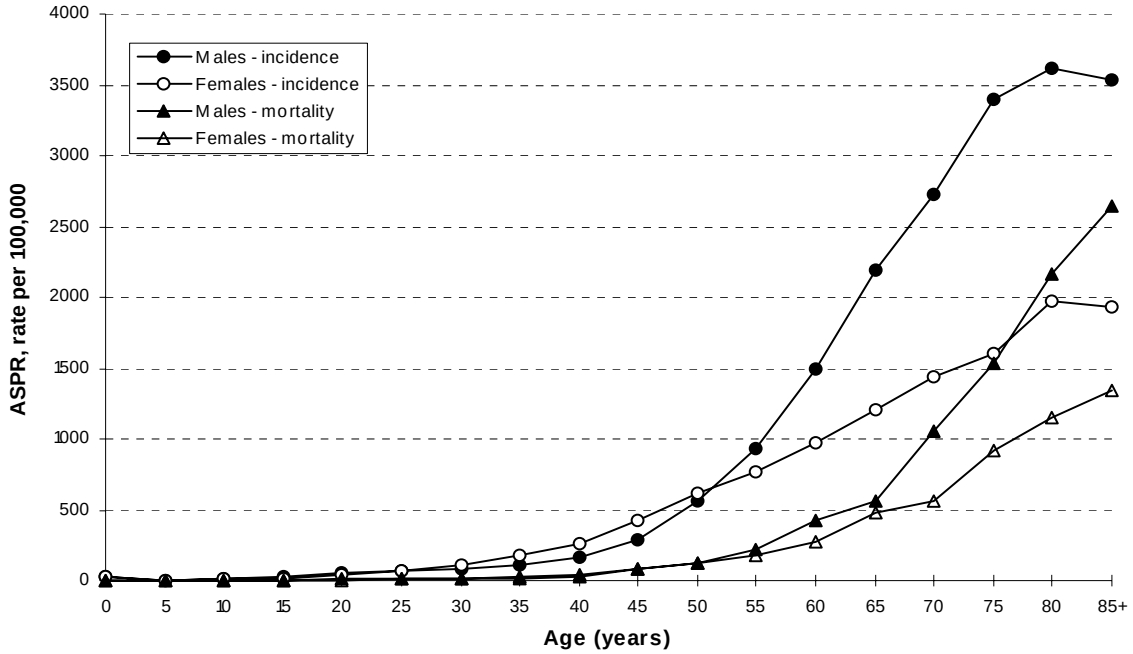
3.4 Cancer incidence and mortality: age distributions

Cancer is widely regarded as a disease which most often affects older people and this is supported by Figure 12. However there are well-known exceptions, notably testicular cancer in men, thyroid cancer in women, and primary bone cancers in both. Other variations are less well-known. In this section of the report, we present graphs to illustrate the variation in cancer incidence and mortality with age for the most common incident cancers, and for other cancers of common interest. These data are presented with minimal comment, as a discussion of possible reasons for the different patterns seen for different cancer types is beyond the scope of this report.

All cancers combined

Male all-cancers incidence and mortality rates generally exceed those in females after the age of 50 years; the higher rates in younger women are primarily due to breast cancer.

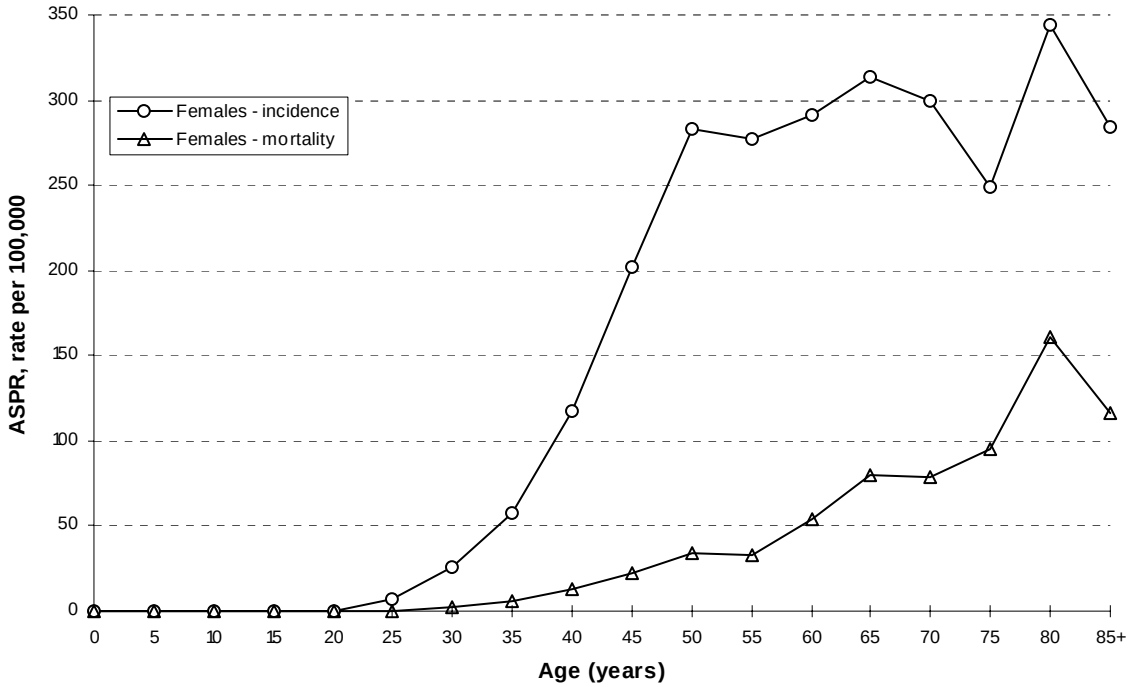
Figure 12. Age-specific all-cancers incidence and mortality rates, Western Australia, 2004.



Breast cancer

Women aged 50-69 years are actively targeted by BreastScreen WA's mammography screening service, and one of the measures of success is the early detection of small tumours.[5,6] It appears likely that the drop in incidence in the 70-79 age range is associated with the end of active screening, and is followed by a later rise with an associated increase in mortality (Fig. 13).

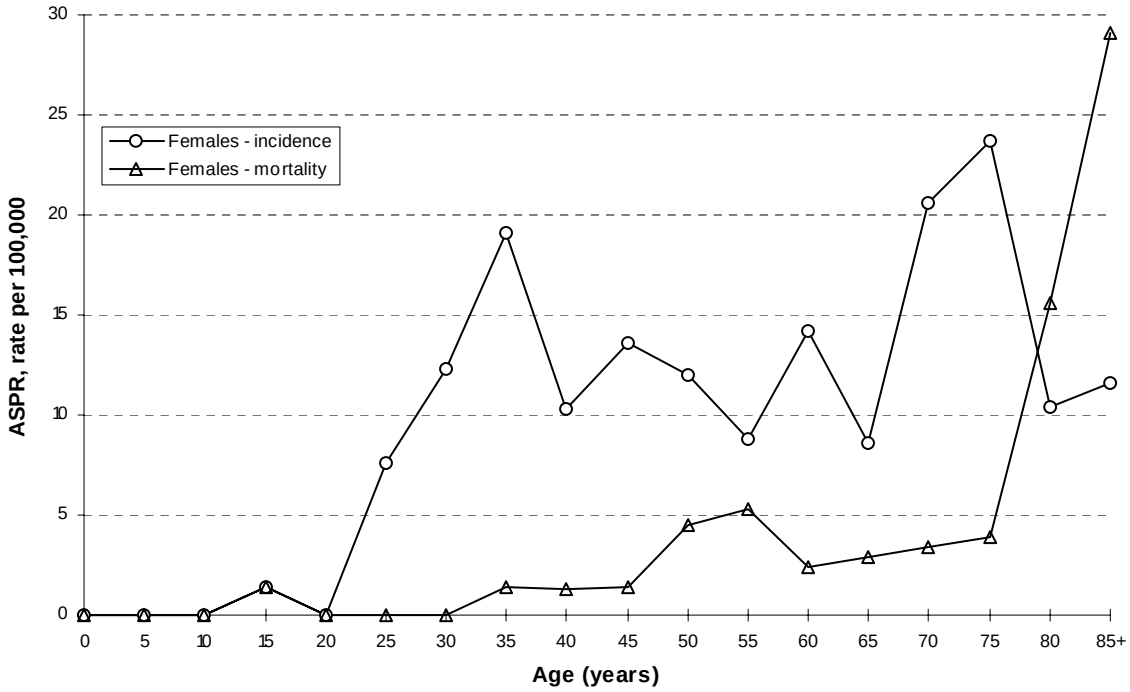
Figure 13. Age-specific breast cancer incidence and mortality rates, Western Australia, 2004.



Cervical cancer

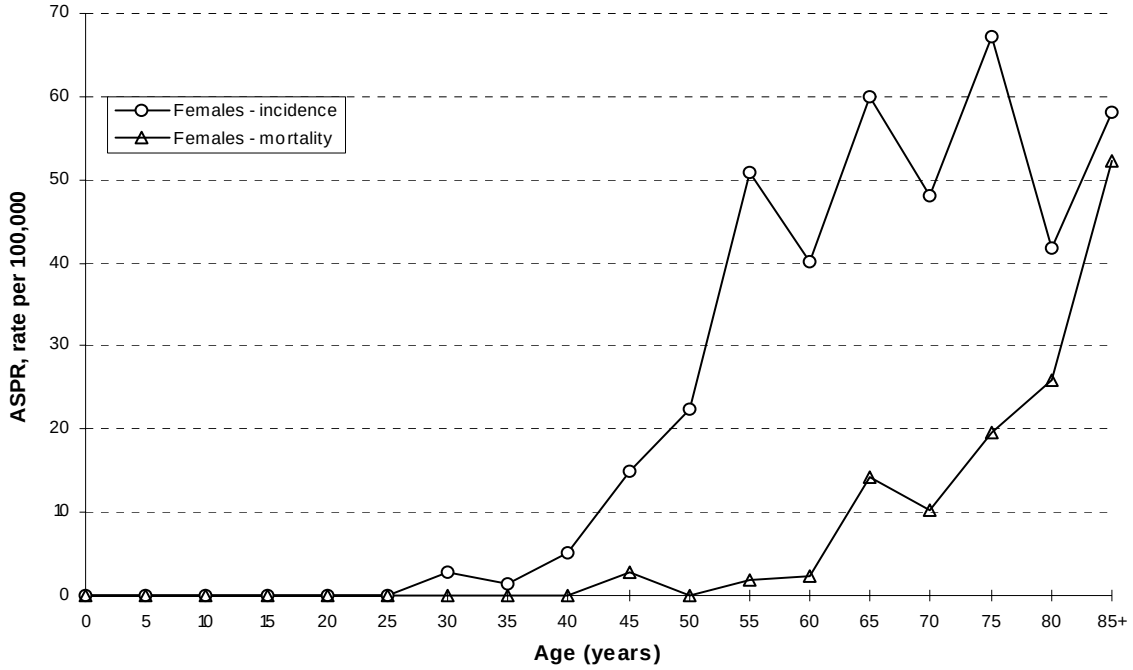
Pap-smear detected cervical cancers are likely to be diagnosed at a relatively early stage of the disease, and this condition has a low mortality / incidence rate ratio except in women aged over 75.

Figure 14. Age-specific cervical cancer incidence and mortality rates, Western Australia, 2004.



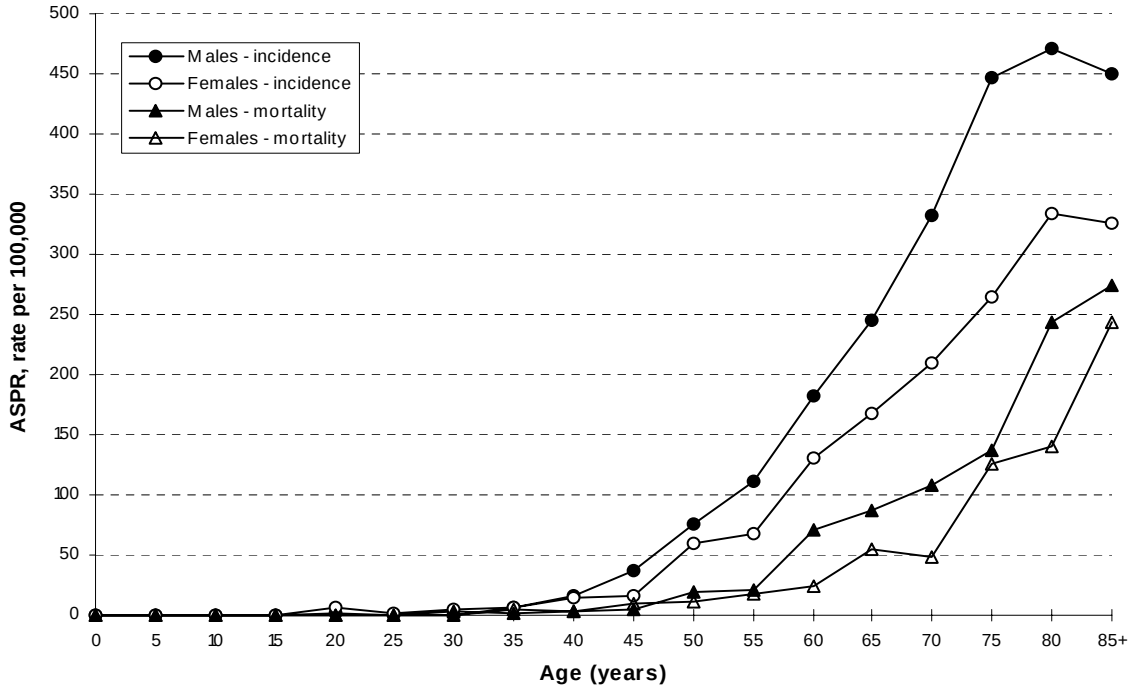
Uterine cancer

Figure 15. Age-specific uterine cancer incidence and mortality rates, Western Australia, 2004.



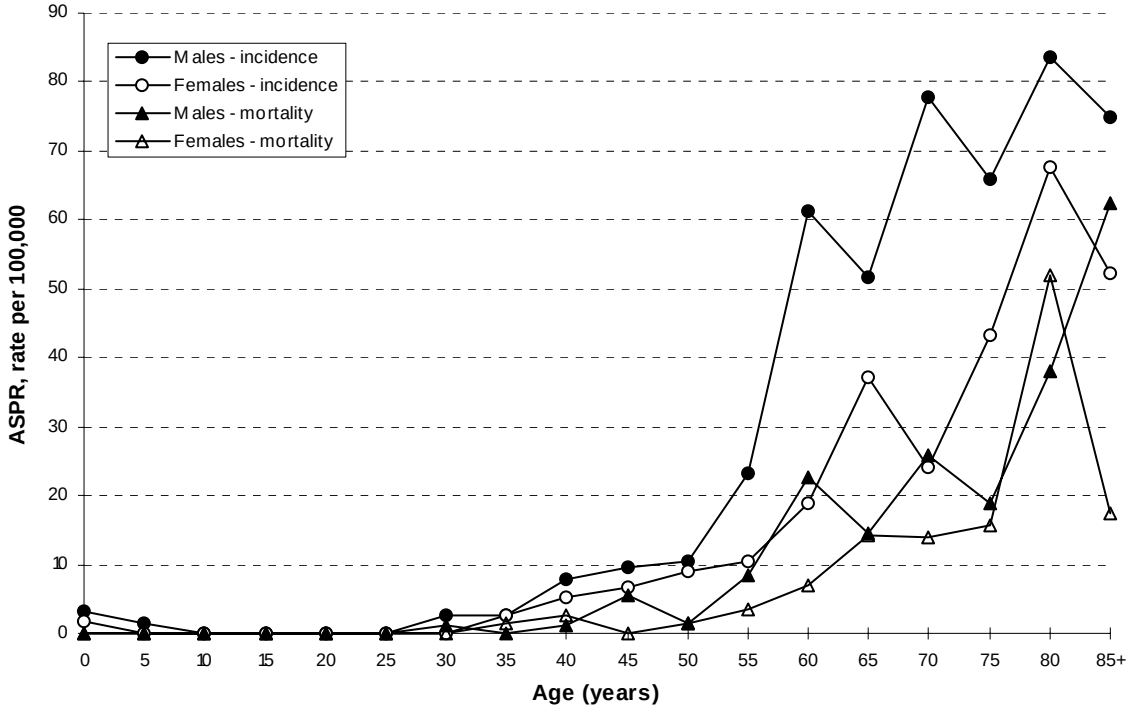
Colorectal cancer

Figure 16. Age-specific colorectal cancer incidence and mortality rates, Western Australia, 2004.



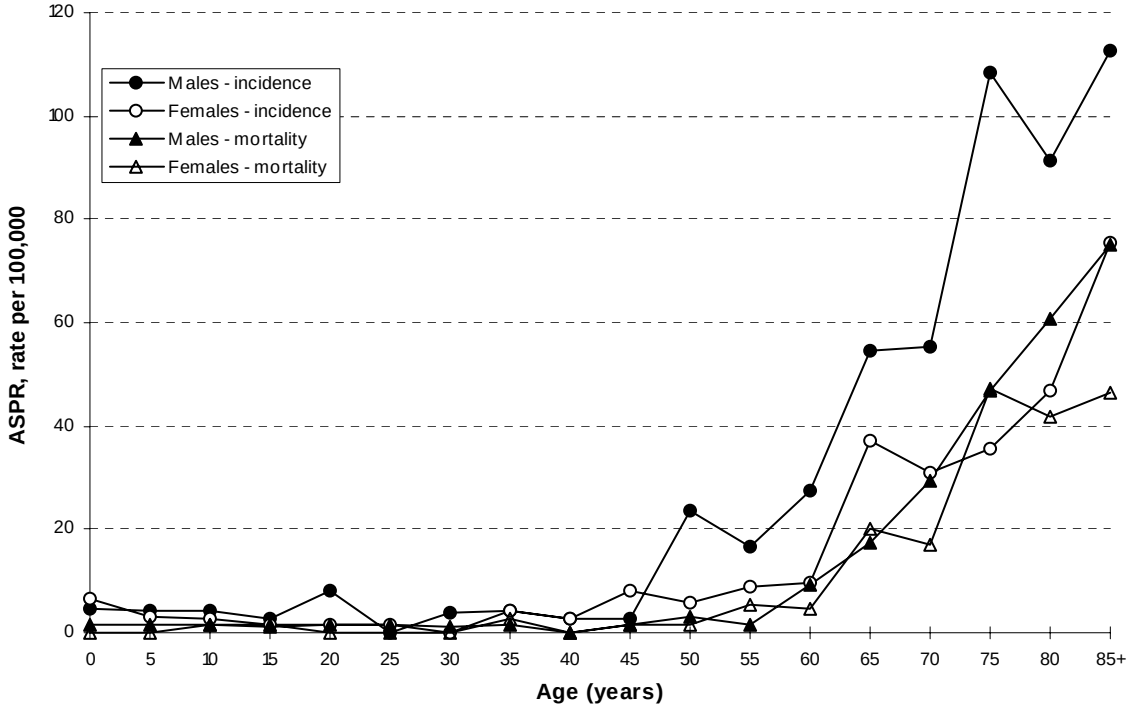
Kidney cancer

Figure 17. Age-specific kidney cancer incidence and mortality rates, Western Australia, 2004.



Leukaemia (all types combined)

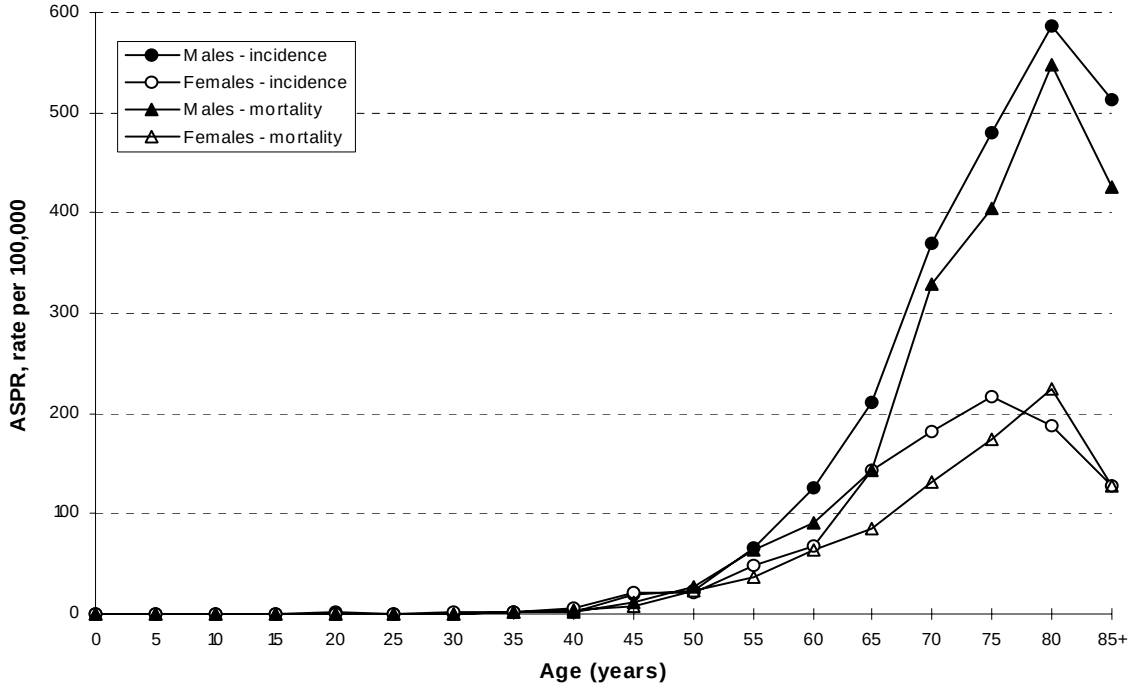
Figure 18. Age-specific leukaemia incidence and mortality rates, Western Australia, 2004.



Lung cancer

Lung cancer is more usually fatal than many other cancer types in males and females, and incidence and mortality lines are not widely separated.

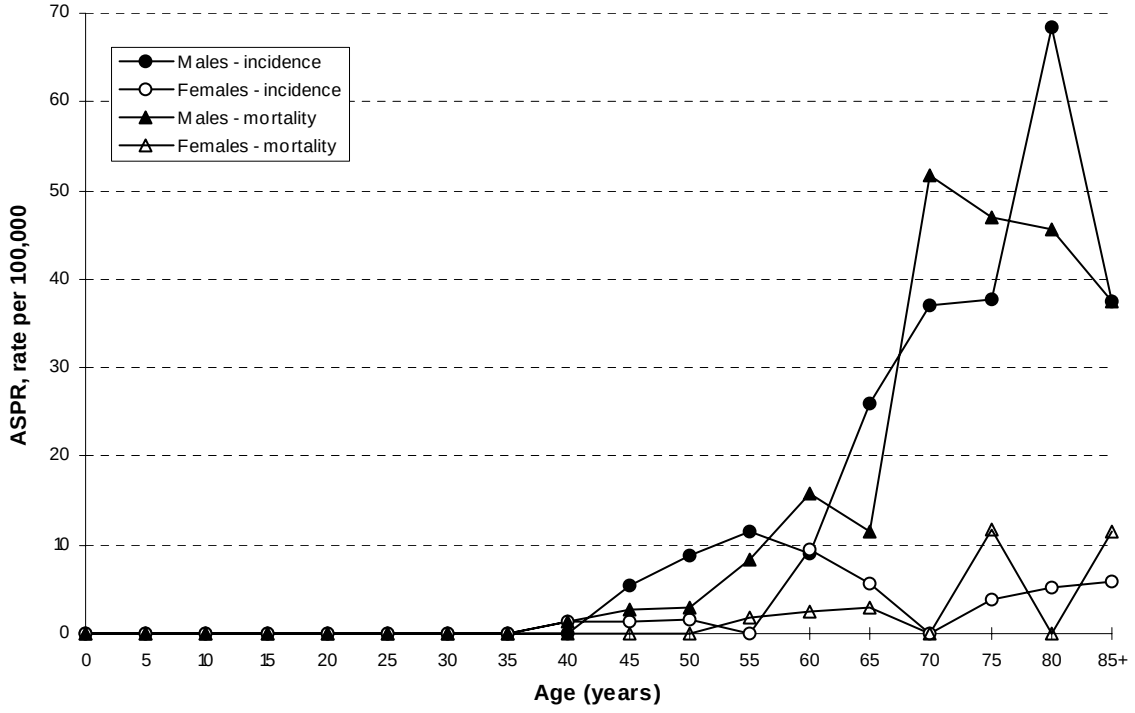
Figure 19. Age-specific lung cancer incidence and mortality rates, Western Australia, 2004.



Mesothelioma

Mesothelioma is usually a fatal disease, and incidence and mortality lines are close and often overlap.

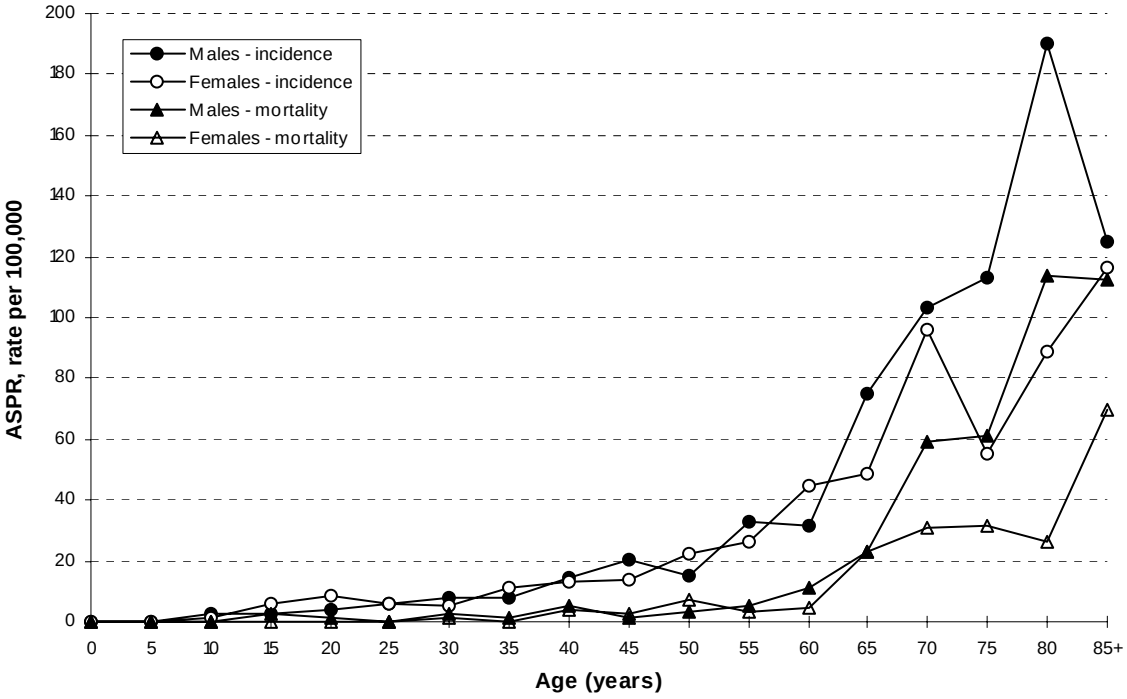
Figure 20. Age-specific mesothelioma incidence and mortality rates, Western Australia, 2004.



Lymphoma (all types combined)

Lymphoma in both males and females is, more often than many cancer types, diagnosed in people under 50 years of age. It does occur in childhood, and incidence increases gradually with age.

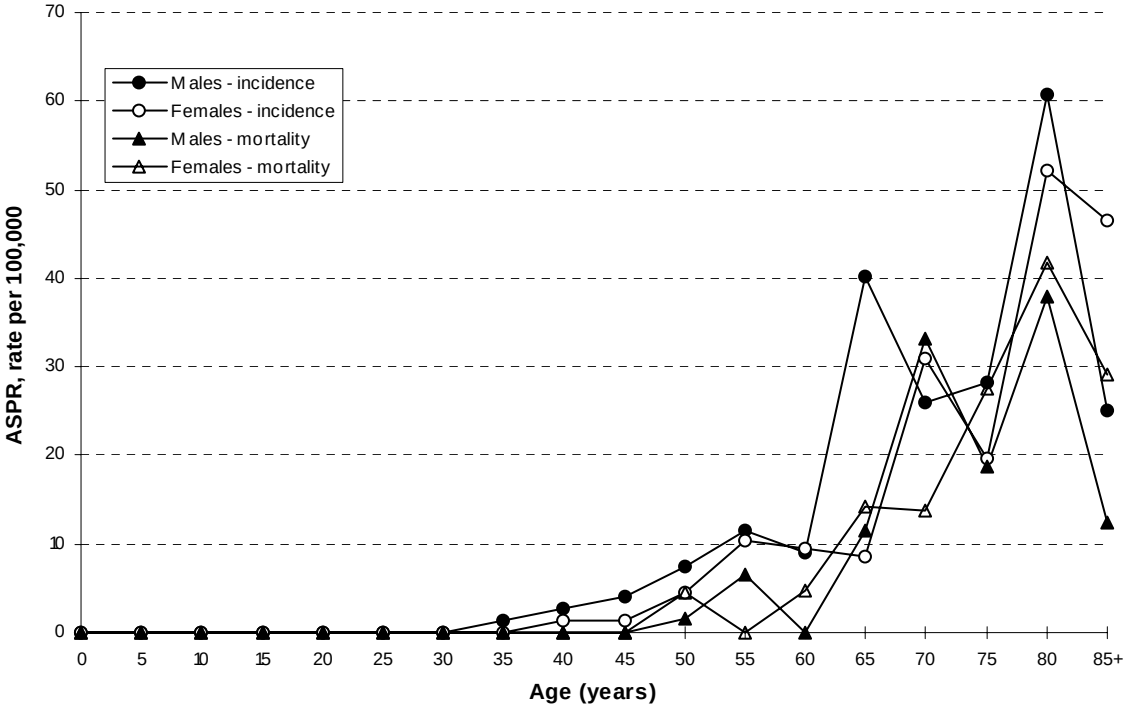
Figure 21. Age-specific lymphoma incidence and mortality rates, Western Australia, 2004.



Myeloma

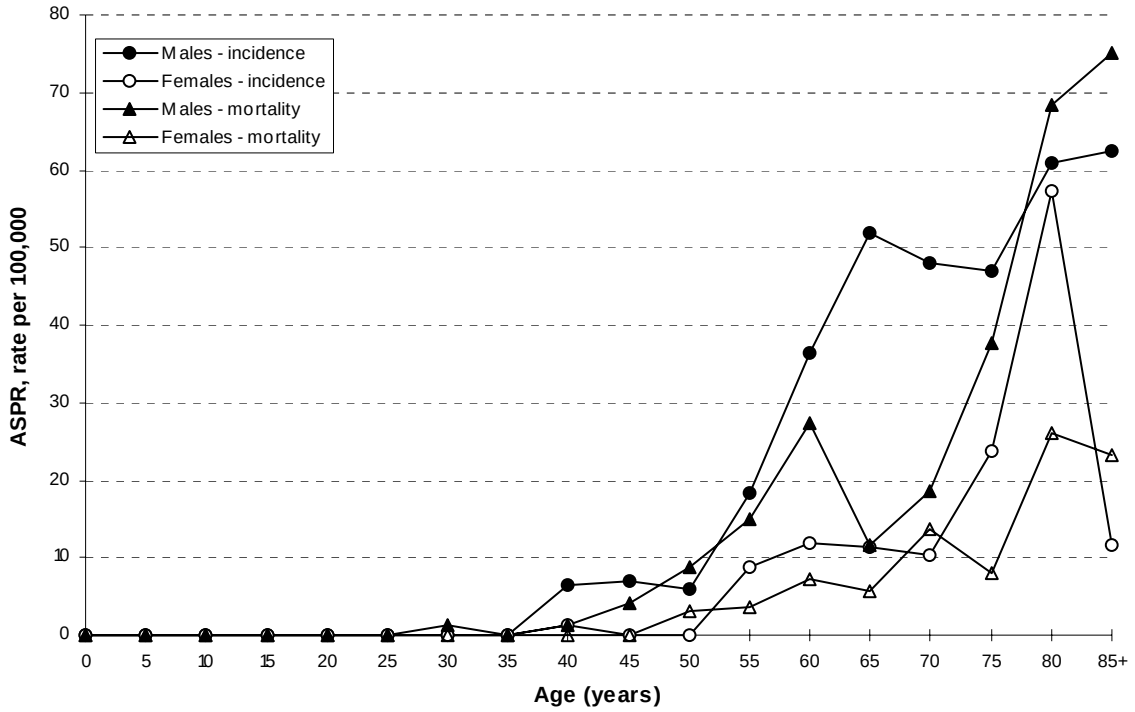
Myeloma is predominantly a disease of older people. Incidence and mortality rates for males are often similar to those seen among females, which is unusual.

Figure 22. Age-specific myeloma incidence and mortality rates, Western Australia, 2004.



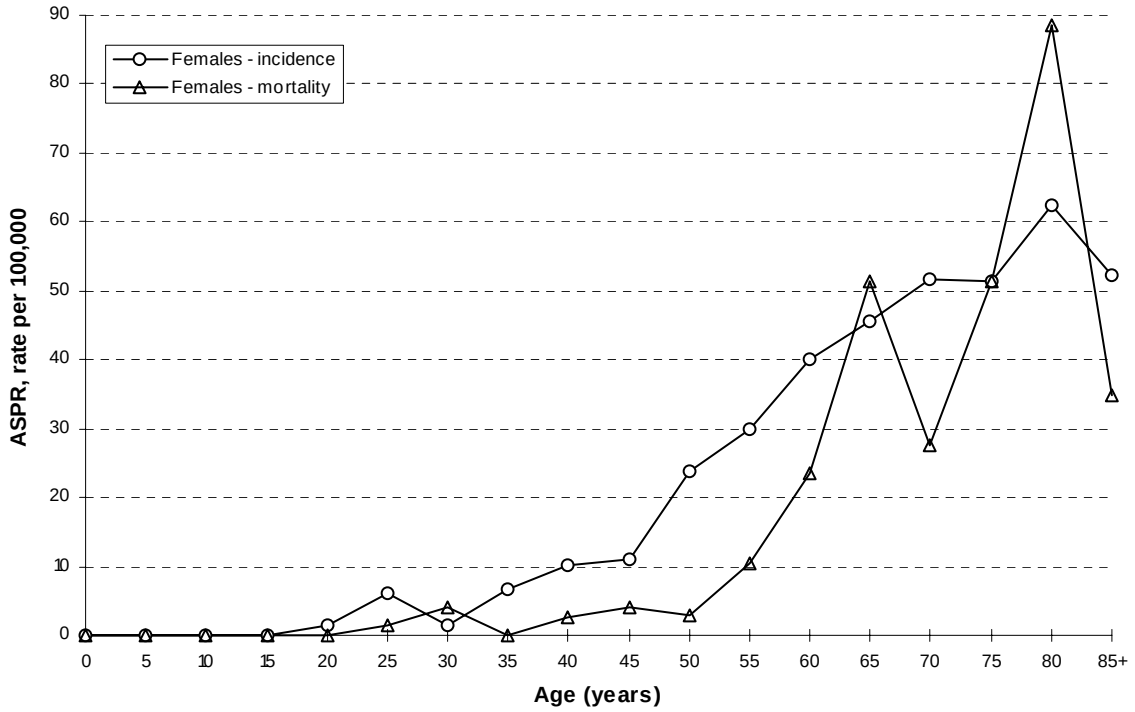
Oesophageal cancer

Figure 23. Age-specific oesophageal cancer incidence and mortality rates, Western Australia, 2004.



Ovarian cancer

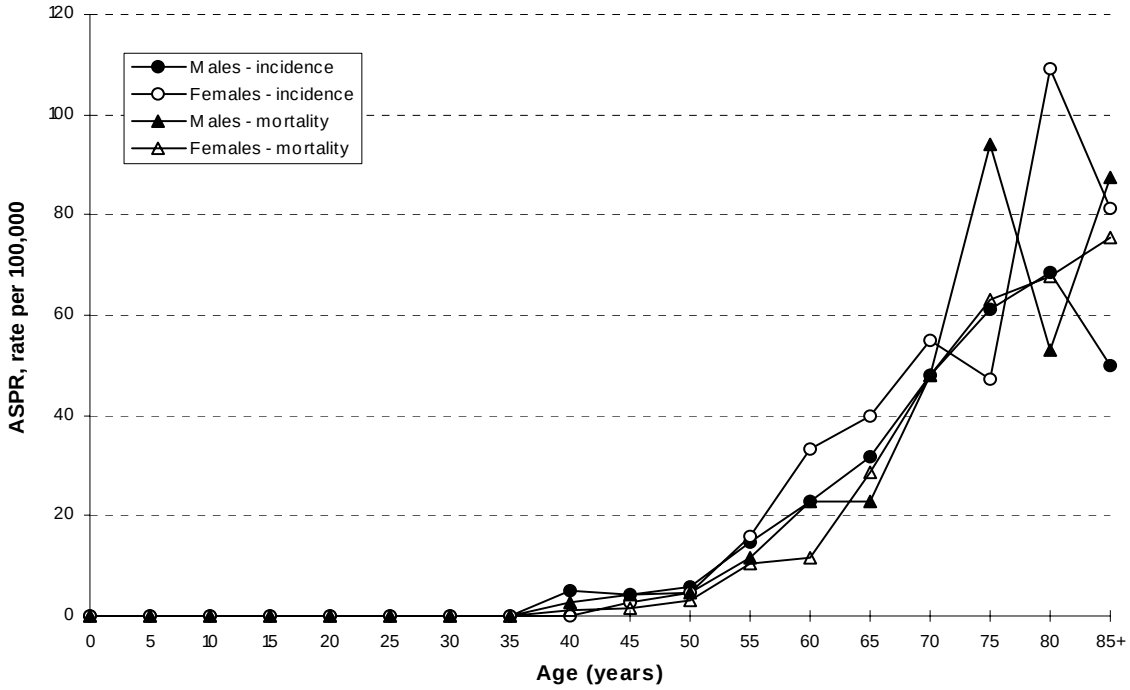
Figure 24. Age-specific ovarian cancer incidence and mortality rates, Western Australia, 2004.



Pancreatic cancer

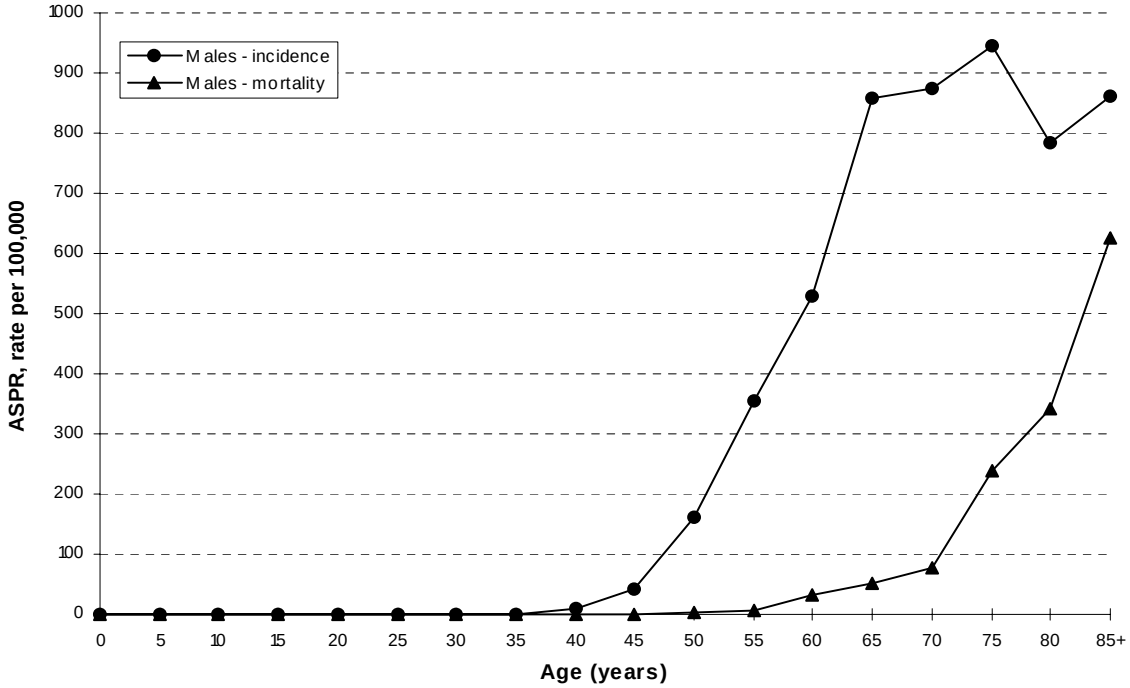
Both incidence and mortality rates for pancreatic cancer among males are unusually similar to those seen among females; female incidence is often higher than incidence in males at the same age.

Figure 25. Age-specific pancreatic cancer incidence and mortality rates, Western Australia, 2004.



Prostate cancer

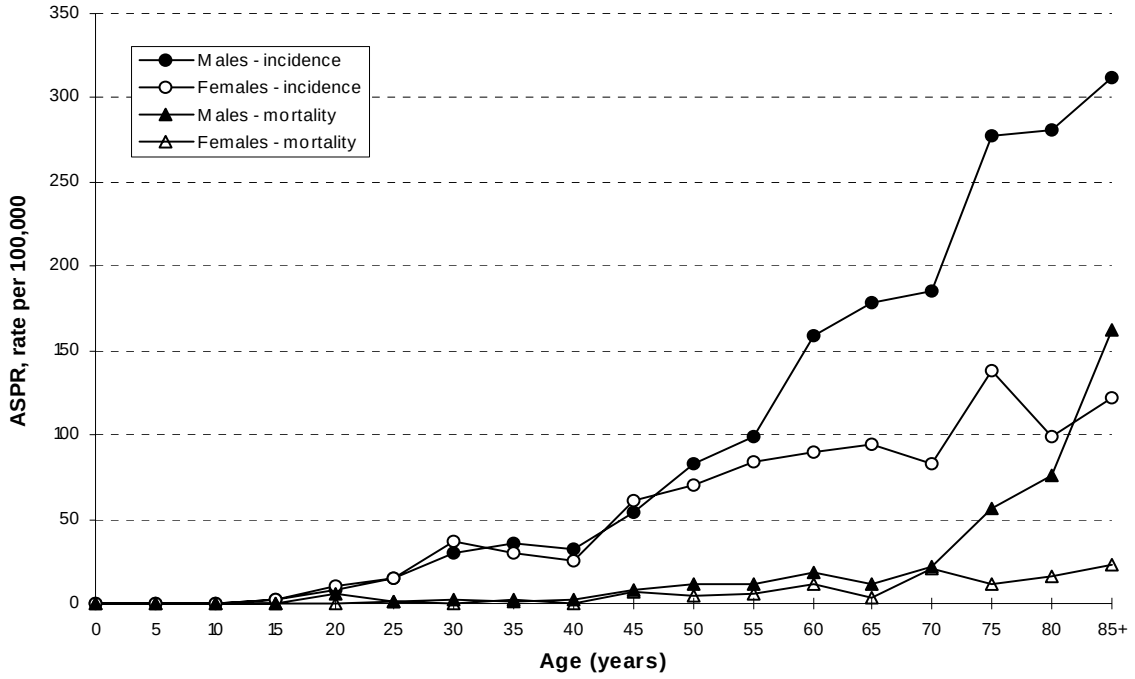
Figure 26. Age-specific prostate cancer incidence and mortality rates, Western Australia, 2004.



Melanoma

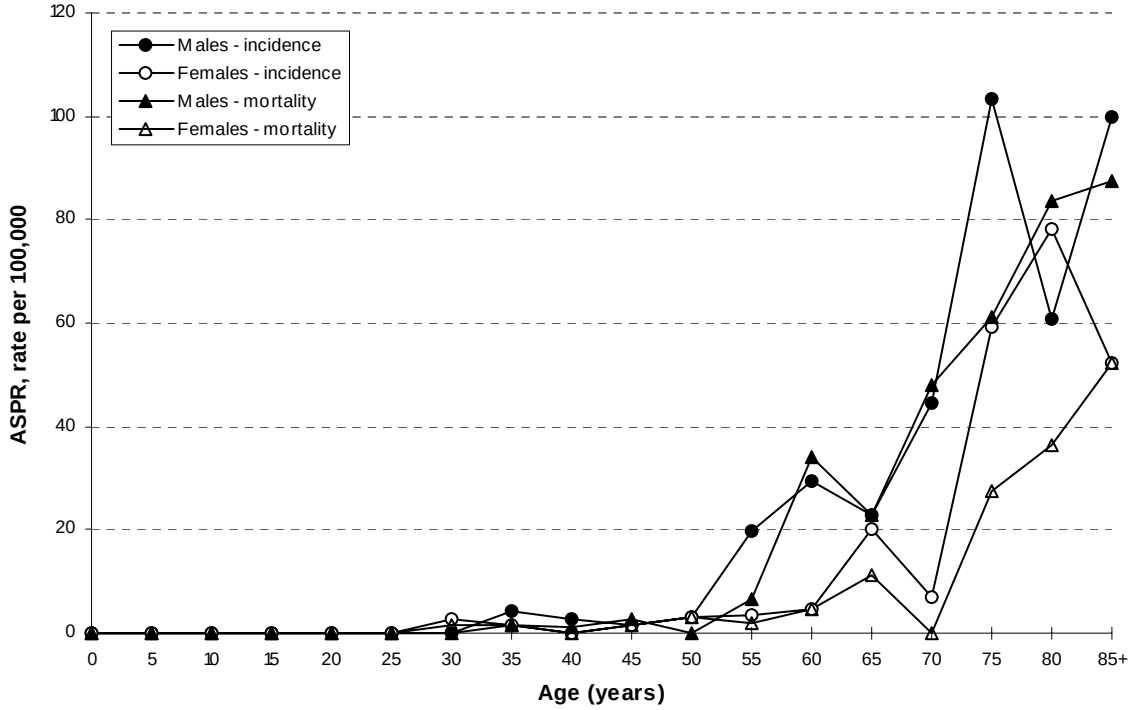
Skin melanoma incidence rates are similar in males and females until the 40-49 age range, with male rates up to double female rates in the oldest age groups.

Figure 27. Age-specific melanoma incidence and mortality rates, Western Australia, 2004.



Stomach cancer

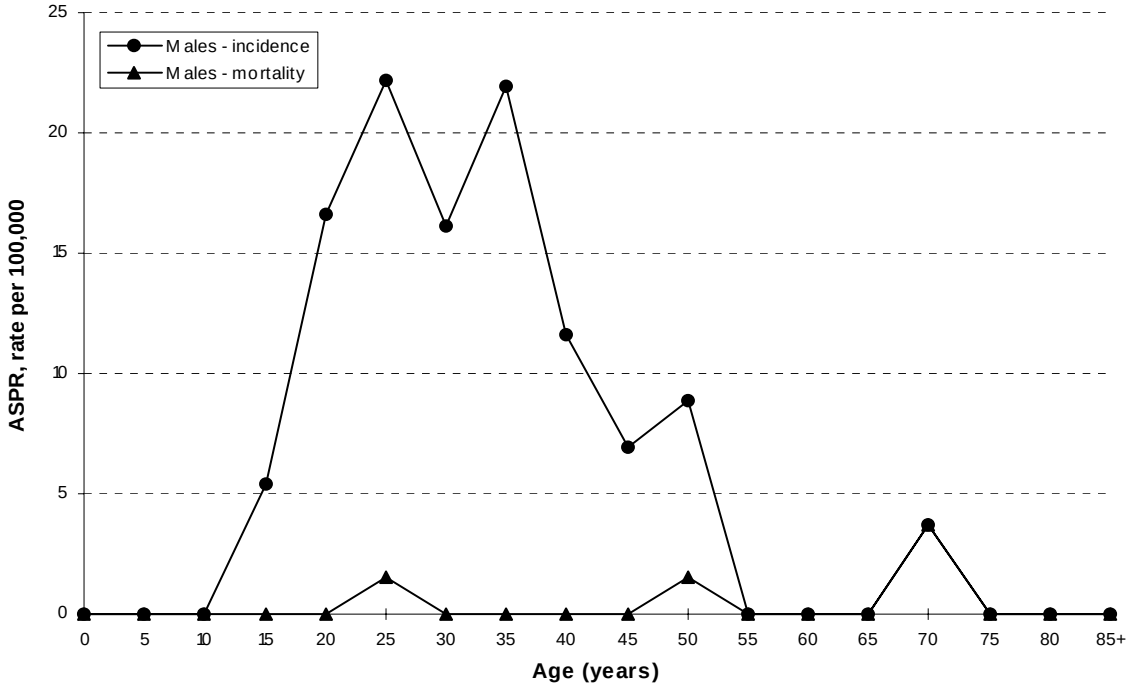
Figure 28. Age-specific stomach cancer incidence and mortality rates, Western Australia, 2004.



Testicular cancer

Testicular cancer is predominantly a disease of men under the age of 45 years, and survival is better than for most other forms of cancer.

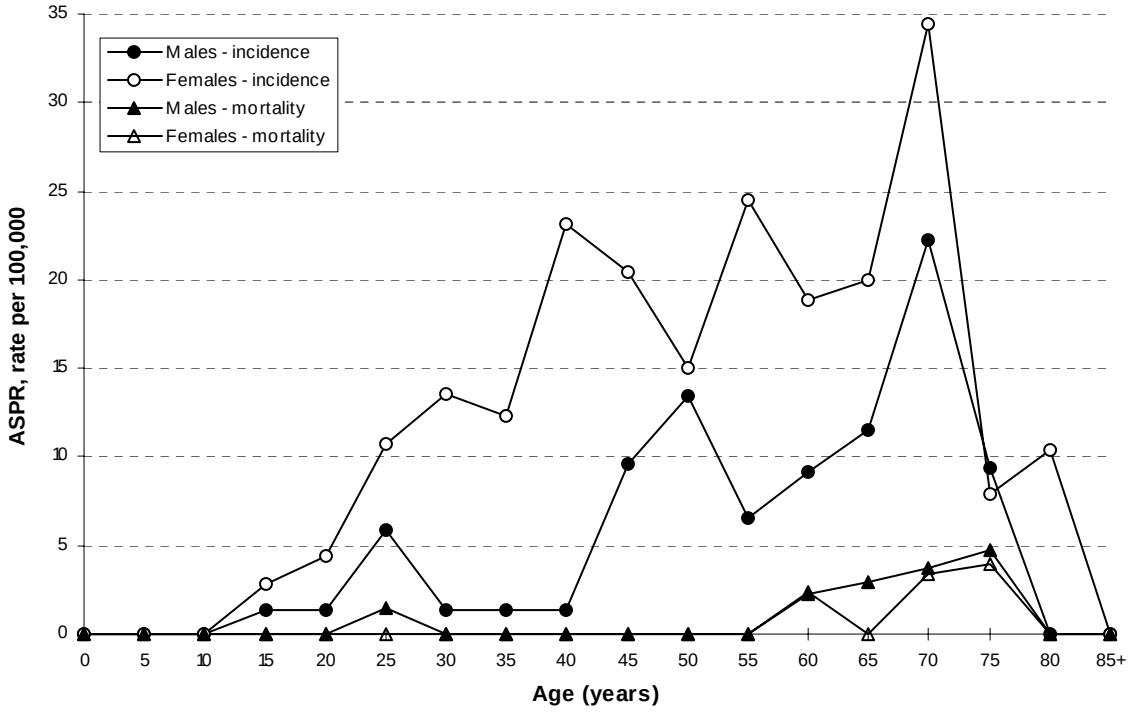
Figure 29. Age-specific testicular cancer incidence and mortality rates, Western Australia, 2004.



Thyroid cancer

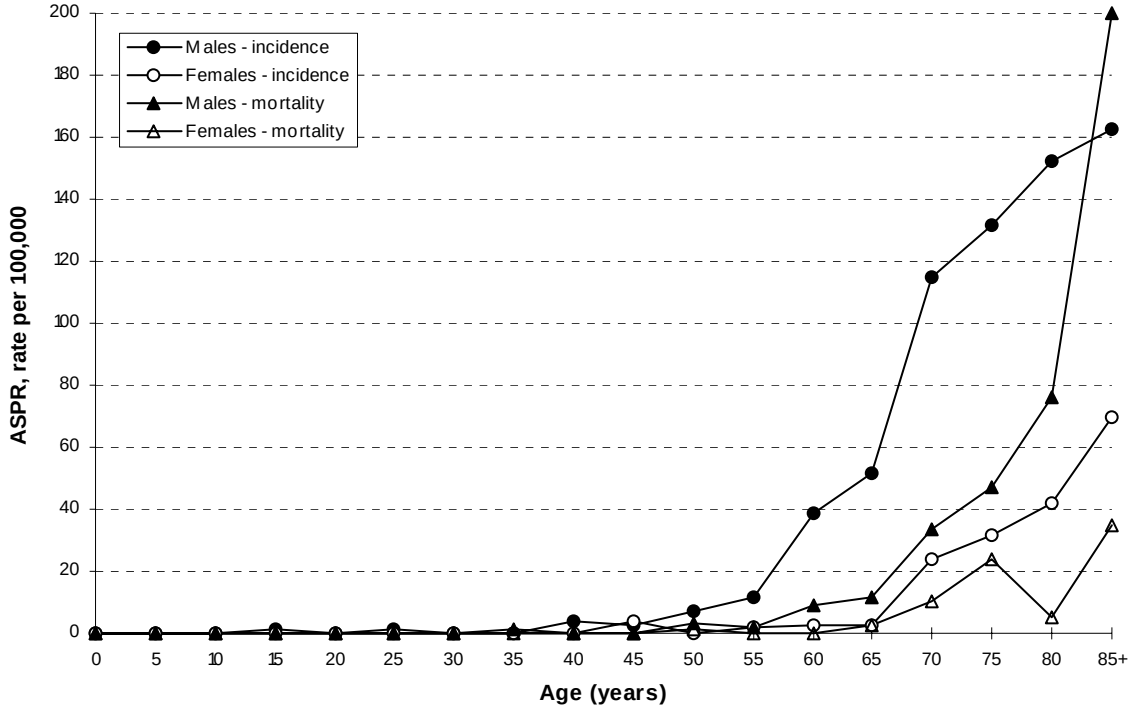
Thyroid cancer is more common among women then men throughout life, but male and female mortality rates are similar.

Figure 30. Age-specific thyroid cancer incidence and mortality rates, Western Australia, 2004.



Bladder cancer

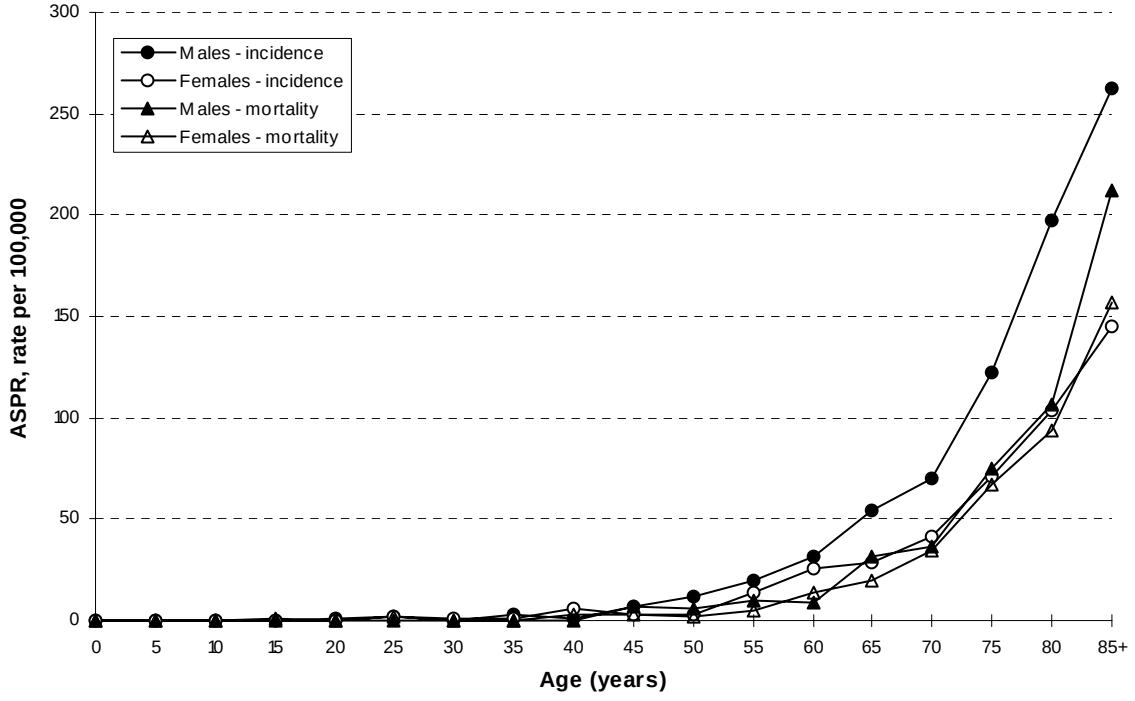
Figure 31. Age-specific bladder cancer incidence and mortality rates, Western Australia, 2004.



Cancers of unknown primary site

While cancers of unknown primary site are more common among males than among females in most age groups, male and female mortality rates are similar.

Figure 32. Age-specific unknown primary site cancer incidence and mortality rates, Western Australia, 2004.



3.5 Changes in age-specific cancer incidence rates, 1982-2004

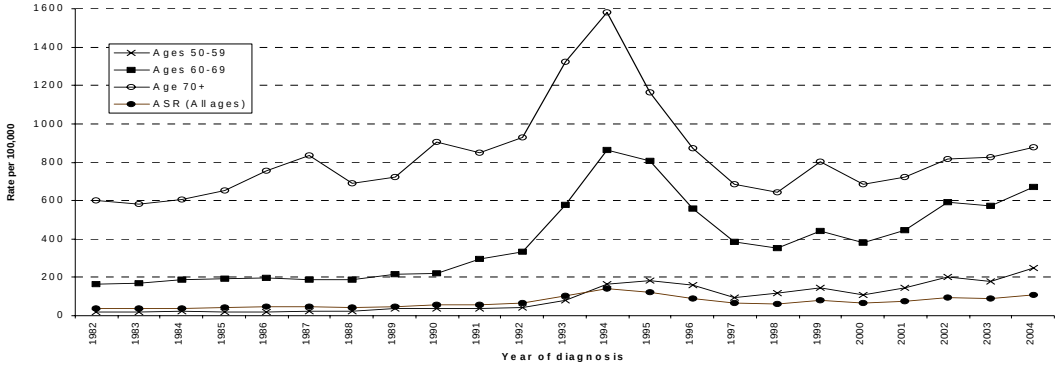
Over time, all-ages incidence rates for some cancers change, however the most significant changes may appear to be confined to certain subgroups of the age-range. The graphs which follow have been chosen to illustrate some such differences, with comments where appropriate.

Prostate cancer

The all-ages prostate cancer ASR doubled between 1992 and 1994, then halved again by 1996, and has since continued to rise in a similar fashion to that seen before 1992.

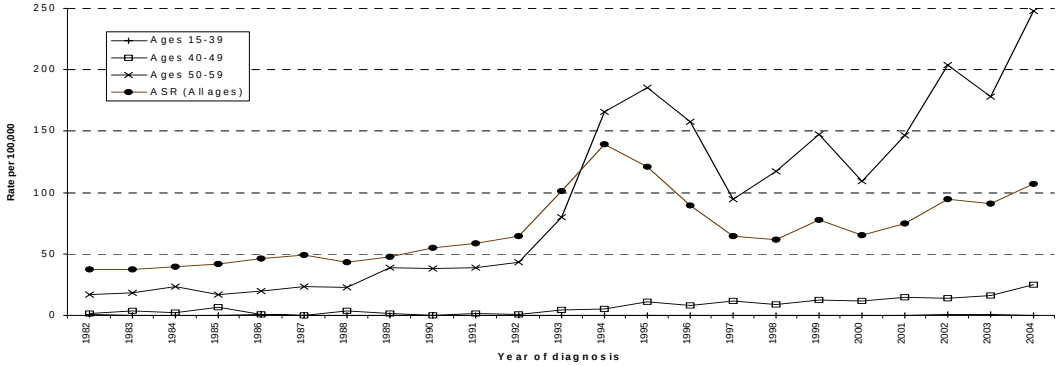
While the age-specific rates of 1994 were highest in men aged 70 or more and dominate the graphical presentation (Fig. 33), the proportional increases were greater in the youngest age groups (Fig. 34).

Figure 33. Prostate cancer, Western Australia: changes in age-specific incidence rates, 1982-2004 - older age groups.



Age-specific rates in men aged 70 or more increased by a factor of 1.7 between 1992 and 1994, but the corresponding increase for those aged 50-59 was 3.8 and for those aged 40-49, 5.6. Men in the 40-49 years age group have featured consistently on the incidence rate graph only since 1993, and - in contrast to all the older age groups - incidence never declined dramatically after 1994, and has continued to increase. There have been various publications dealing with the age and socioeconomic-status differentials of prostate cancer trends in Australia,[7] and the most likely explanation for these data remains the increased use of PSA testing for the detection of prostate cancer in asymptomatic, younger males.

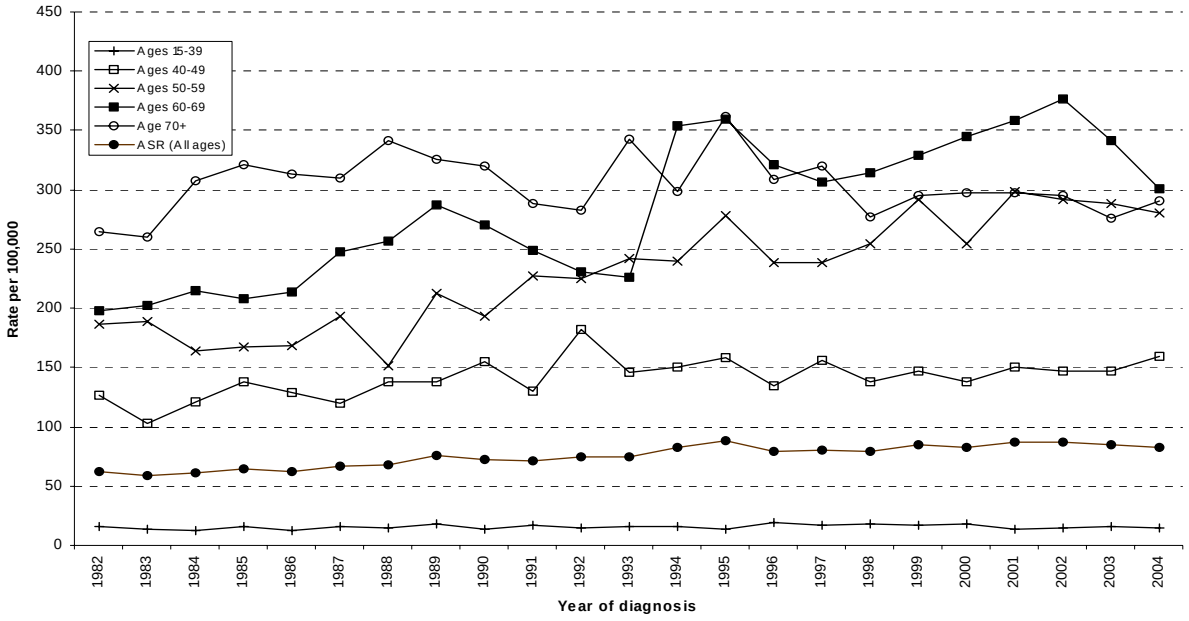
Figure 34. Prostate cancer, Western Australia: changes in age-specific incidence rates, 1982-2004 - younger age groups.



Breast cancer (in females)

Since 1982 there has been a steady increase in breast cancer incidence in Western Australian women from 60 per 100,000 to 83 per 100,000. This has not occurred in younger women aged 15-39; the marked increases have been in women aged 50 or more and are likely to have been influenced by mammographic screening activity.

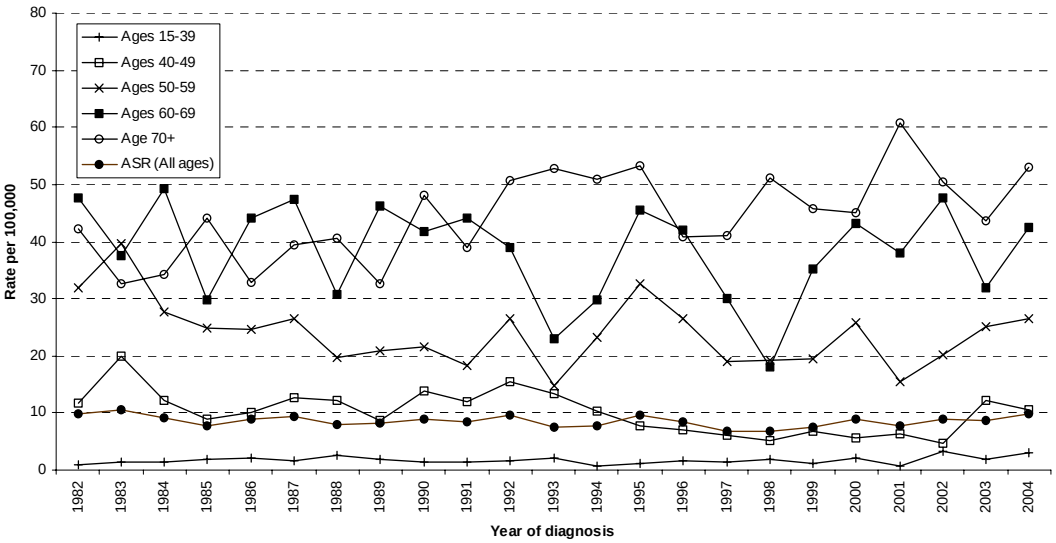
Figure 35. Breast cancer, Western Australia (females): changes in age-specific incidence rates, 1982-2004.



Ovarian cancer

Ovarian cancer rates are low and have remained stable since 1982 in young women (15-39 years). In those aged 40-49 and 50-59 there has generally been a downward trend in incidence, but rates have been stable or increasing in the oldest age group (Fig. 38).

Figure 36. Ovarian cancer, Western Australia: changes in age-specific incidence rates, 1982-2004.



Colorectal cancer

Incidence rates have remained remarkably steady over the period 1982-2004.

Figure 37. Colorectal cancer, Western Australia (males): changes in age-specific incidence rates, 1982-2004.

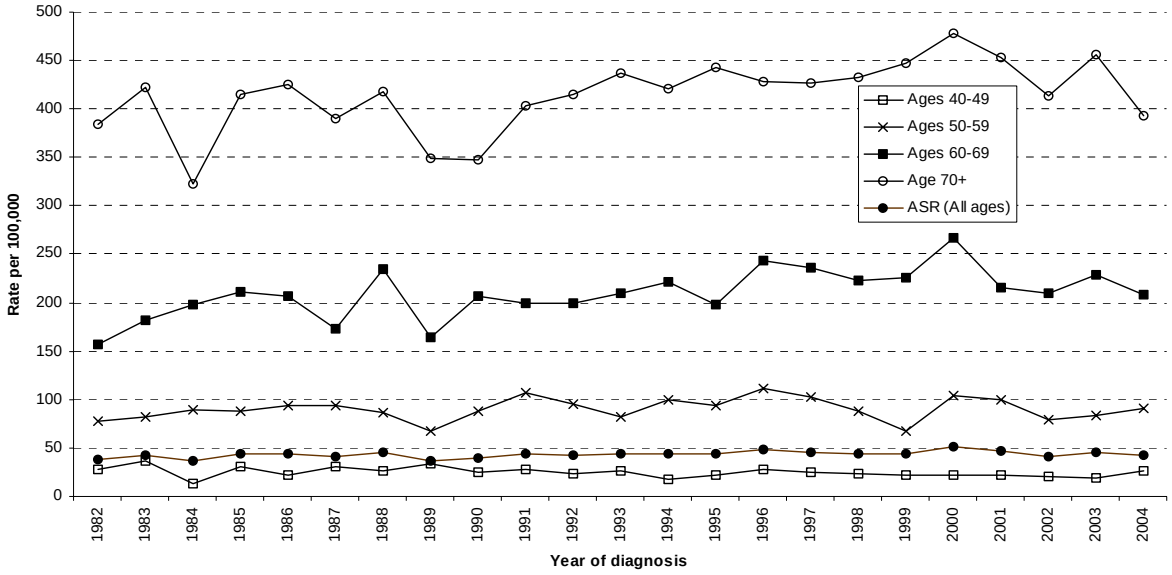
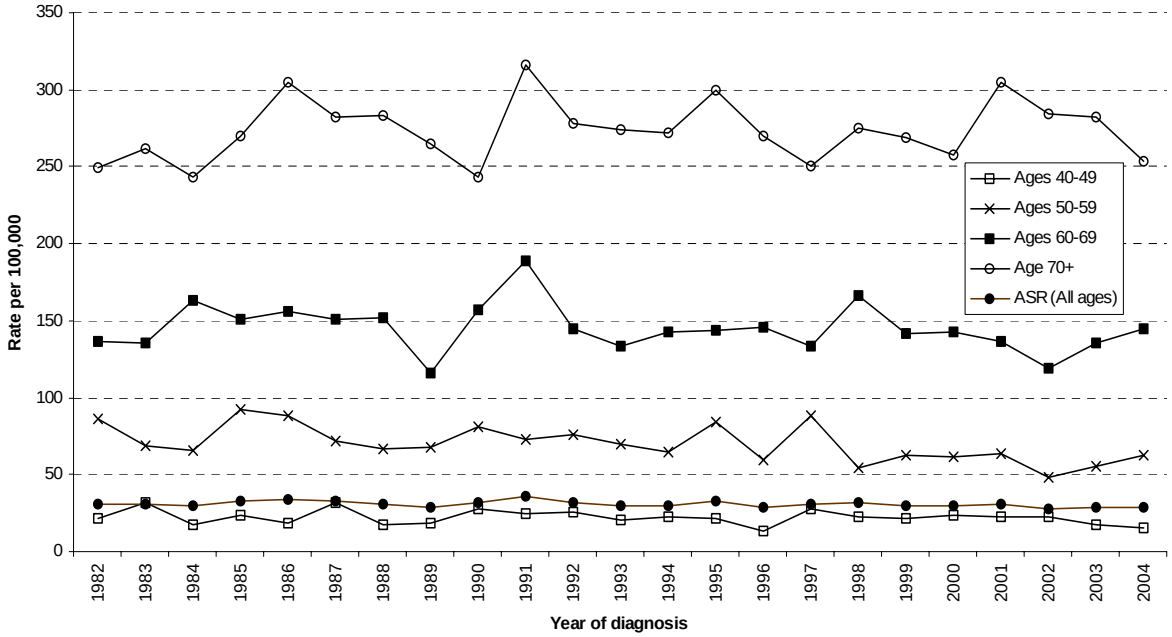


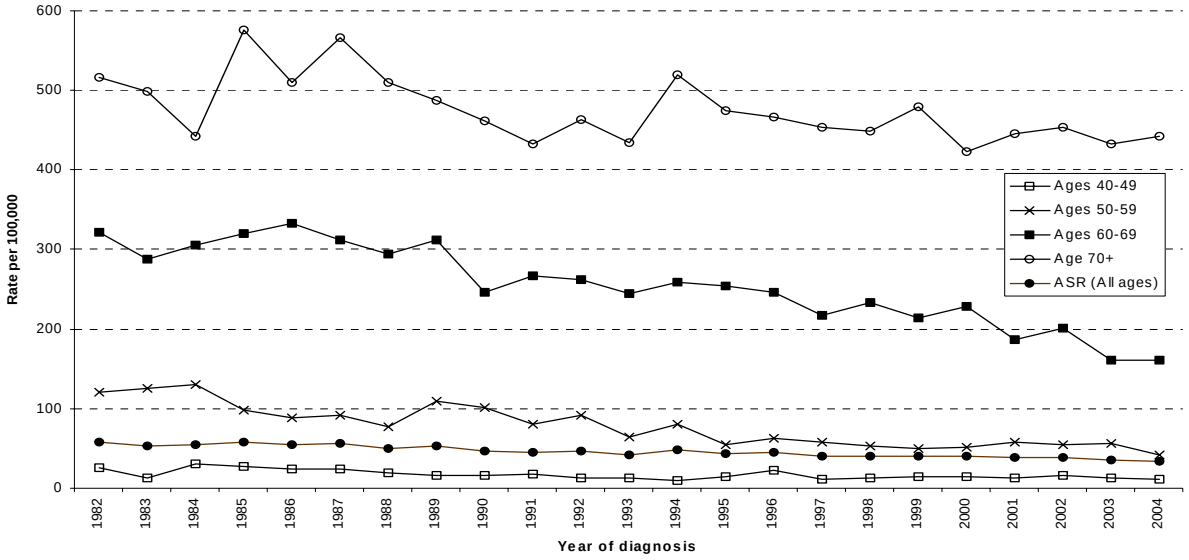
Figure 38. Colorectal cancer, Western Australia (females): changes in age-specific incidence rates, 1982-2004.



Lung cancer

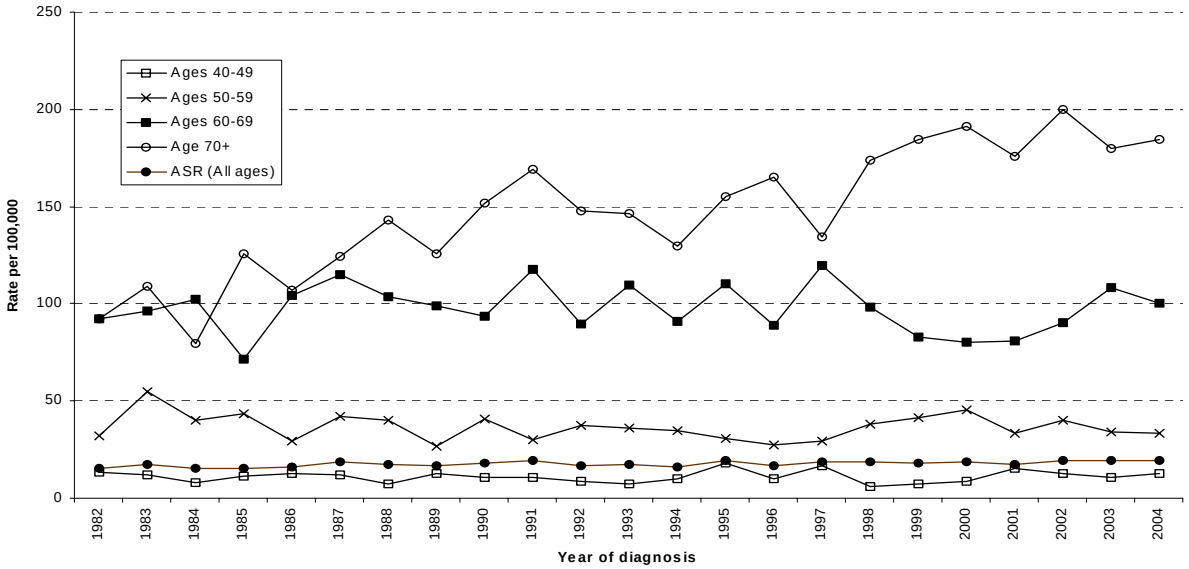
Lung cancer incidence in Western Australian males has been stable or decreasing since 1982, and this trend has been evident in all age groups (Fig. 39).

Figure 39. Lung cancer, Western Australia (males): changes in age-specific incidence rates, 1982-2004.



However, incidence rates in females have increased slightly and this is almost totally due to increases in the over-70 age range. While rates in the 40-49 years and 50-59 years age ranges have not shown an increase, neither do they show the same decrease as is evident for males (Fig. 40).

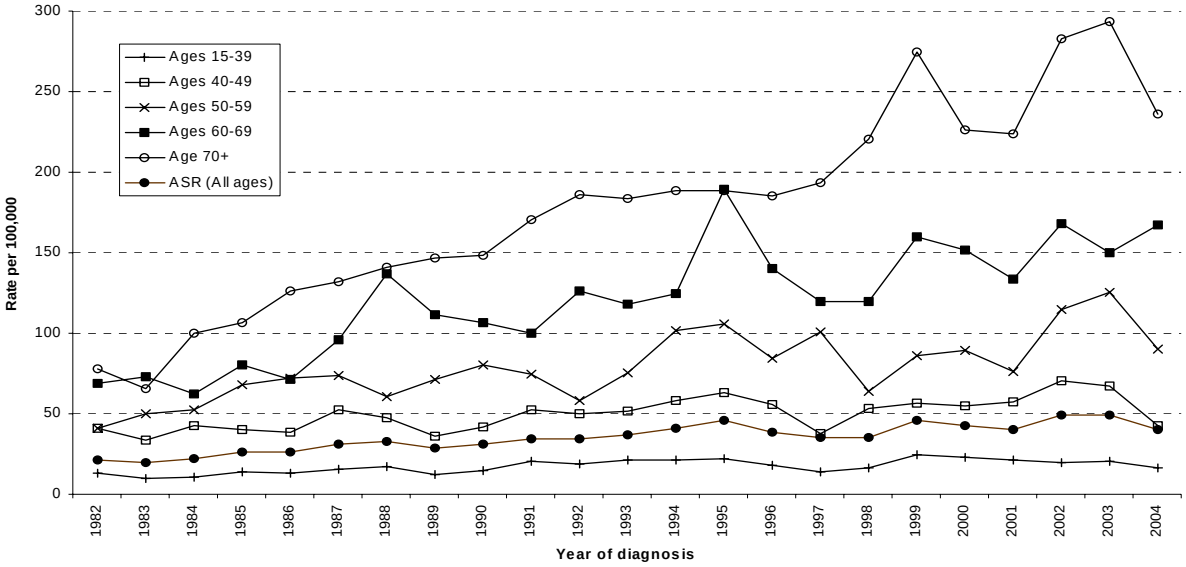
Figure 40. Lung cancer, Western Australia (females): changes in age-specific incidence rates, 1982-2004.



Melanoma

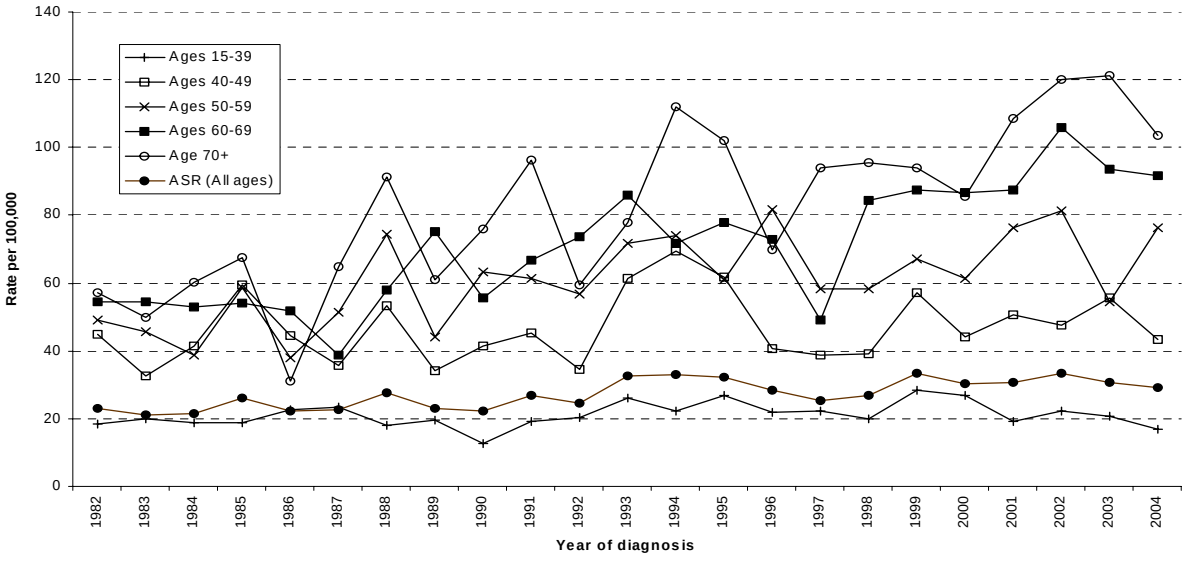
Increasing melanoma ASRs in males have been largely driven by changes in the older age groups (Fig. 41). Age-specific rates in the 15-39 and 40-49 years age groups in 2004 were almost identical to those in 1982 while there was a steady increase in incidence in the 50-59 and 60-69 year age groups. Rates in the over-70 age range increased more than three-fold, from 78 per 100,000 in 1982 to 236 per 100,000.

Figure 41. Melanoma, Western Australia (males): changes in age-specific incidence rates, 1982-2004.



As in males, melanoma rates in females were almost unchanged in the 15-39 and 40-49 years age ranges between 1982 and 2004, while rates in those aged 70 or more increased from 57 to 103 per 100,000. Overall, there is more overlap between incidence rates in the different age groups, than seen for males.

Figure 42. Melanoma, Western Australia (females): changes in age-specific incidence rates, 1982-2004.



Stomach cancer

Stomach cancer incidence in males has fallen since 1982, and this trend has been evident in all age ranges in both males and females (Fig. 43 and Fig. 44).

Figure 43. Stomach cancer, Western Australia (males): changes in age-specific incidence rates, 1982-2004.

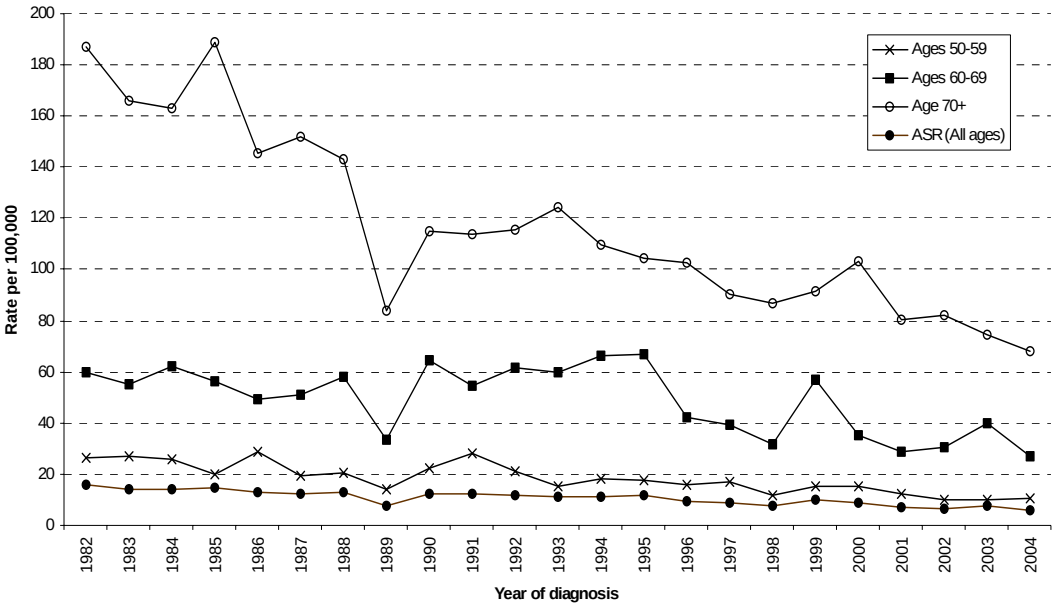
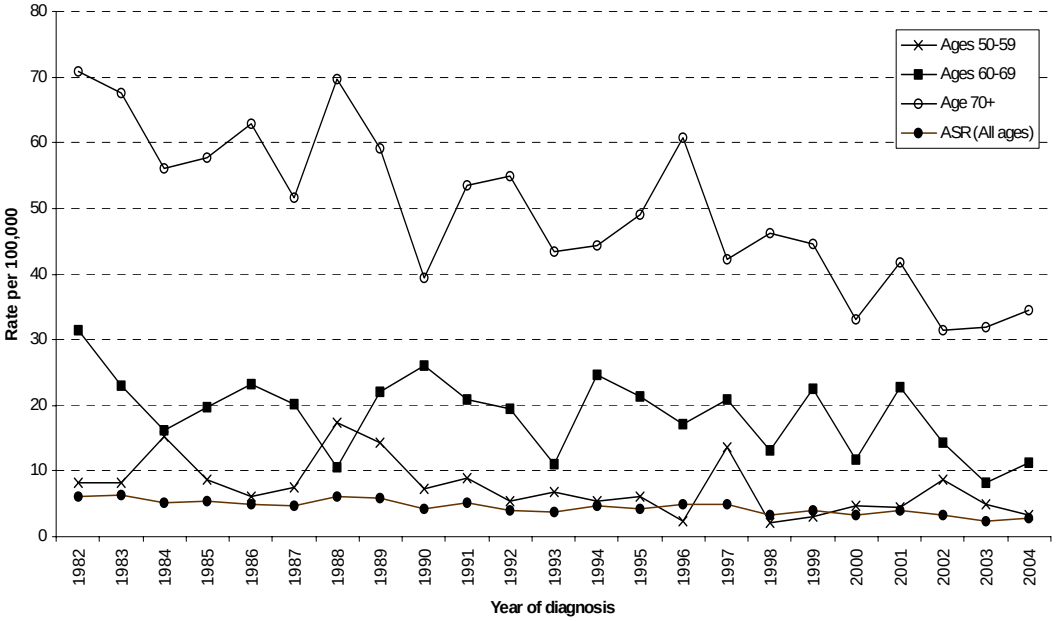


Figure 44. Stomach cancer, Western Australia (females): changes in age-specific incidence rates, 1982-2004.



4. Inclusion of Hospital Morbidity Data System (HMDS) coded records in Western Australian cancer incidence data

4.1 Introduction and definition

This discussion is based upon an internal document which was written in 2000 to describe the potential impact on cancer statistics, of including cases known to the Registry only on the basis of a hospital diagnosis code, i.e. "HMDS-only" cases. It also explains the need for an investigation of the quality of such data.

The original paper was rewritten and updated during 2005 by Ms Arlene Ernzsten, an officer in the Department of Health (WA) Graduate Development Program, who spent 4 months working in the Cancer Registry developing documentation, and commencing a process of investigating the quality of the coded data for hospitalizations in 2004.

The Hospital Morbidity Data System (HMDS) is the data system used to capture data related to admissions and discharges of Western Australian hospital inpatients. HMDS records with any cancer-related diagnosis codes are routinely flagged and made available to the Cancer Registry, where a cumulative archive is maintained. Mainstream uses of this archive include the identification of the most appropriate hospital or doctor to contact for querying existing notifications. The possibility of the secondary use of the HMDS as a source of notifications will be demonstrated and explained in the discussion which follows.

It would be desirable to enter "HMDS-only" cases onto the Registry database as, for various reasons, the Registry is currently not notified of some cancer cases that should be counted in the cancer statistics for WA. By extracting cancer data from the HMDS, the Cancer Registry record can then be used to investigate the cases and further improve the completeness of Registry data. As the Registry information supports research, planning and decision making, it is vital that it be as complete, accurate and reliable as possible. This discussion paper provides support for an investigation of the viability of establishing a practice of routinely collecting and reporting on cancer information from the previously-unutilized HMDS.

4.2 Background

In Western Australia, the *Health (Notification of Cancer) Regulations 1981* under the *Health Act 1911* requires pathologists, haematologists and radiation oncologists to notify the Commissioner of Health each time a person is diagnosed with cancer. Notification is made by sending a copy of the diagnostic report, showing the diagnosis, to the Registry. In practice, the report itself is the notification vehicle.

The Registry, in what is now known as the Information Collection and Management Directorate of the Department of Health (WA), acts as the Director-General's agent by maintaining a database recording incident cancers. The Regulations provide for the Registry to independently request and obtain further information about individual cancer cases from medical practitioners as needed.

Additional Death Certificate Only (DCO) cancer cases which first become known to the Registry via a death certificate, are investigated by WACR staff. Even if the outcome is unsuccessful, these cases are routinely included in the WA cancer statistics.

The Registry receives most information about cancer cases via pathologists and radiation oncologists. Currently, the Registry may remain unaware of cases diagnosed by methods other than pathology tests (including imaging, biochemical, immunological and clinical methods) unless a person dies and a cancer is mentioned in the death notification.

Elsewhere in Australia, hospital reporting of cancer cases is mandatory (Table 5.) The lack of mandated cancer notification by hospitals in Western Australia results in an incomplete picture of cancer incidence, and reduces the relevance and utility of the existing data.

There is variation in notification methods across the country, with a mix of paper-based and electronic notification systems. However, cancer registry workers in some other states have at times expressed concerns over the fine details of the hospital coded cancer data. These staff have indicated that resolving coding issues with hospital staff always succeeds, but that the process requires major investment of staff time. Accordingly, in Western Australia, the use of uncorroborated HMDS data has been regarded with some caution (although audits of HMDS data are conducted in some areas).

Table 5. Sources of cancer incidence information in Australian States and Territories
(Australian Institute of Health and Welfare (AIHW) & Australasian Association of Cancer Registries (AACR) 1999. *Cancer in Australia 1996*. AIHW cat. no. CAN 7. Canberra: AIHW (Cancer Series no. 12) Appendix D, page 73).

Source	NSW	VIC	QLD	WA	SA	TAS	ACT	NT
Public hospitals	Yes	Yes	Yes	No*	Yes	Yes	Yes	Yes
Private hospitals	Yes	Yes	Yes	No*	Yes	Yes	Yes	No
Repatriation hospitals	Yes	Yes	Yes	No*	Yes	Yes	Yes	No
Pathology laboratories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Radiotherapy units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Nursing homes	Yes	No	Yes	No	No	No*	Yes	No
Registrar of Births, Deaths and Marriages	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Doctors	No*	No*	No*	No*	No*	No*	No*	No*

* Data are provided on special request only.

4.3 Options for improved data capture

Three options for improving data capture are proposed in this section.

4.3.1 Passive notification - Use of the HMDS data with no follow-up

The use of the HMDS has much to offer in terms of enhancing registration of cancer patients diagnosed by non-pathological means. This would have the advantage of being a relatively simple and cost-effective alternative to the implementation of a full scale hospital notification system.

A process in use within the Registry in recent years has been used to create over 30,000 cancer records (both invasive and *in situ* in nature) from the HMDS data alone, for diagnoses in the period 1980 to 2004. These records have been added to the Registry database, but are flagged in such a way that they would only be included in reported statistics if and when there is acceptance of a plan to do so.

The introduction of tumour morphology coding to the HMDS in July 2000 has enhanced the Registry's ability to detect errors in coding of diagnoses, and hence improve the reliability of the HMDS data. However, there are still 3 key data elements required by the Registry that are not included in the HMDS data. These are: *Basis of diagnosis, Date of diagnosis,* and *Residential address* at the time of diagnosis.

Added to any concerns about the accuracy of coding, or about the information made available to the coders, it is largely a lack of certainty about these data items that underlies the Registry's reluctance to use uncorroborated HMDS data for incidence reporting purposes.

4.3.2 Passive notification - Use of the HMDS with active follow-up

To determine whether the data collected from the HMDS is accurate, one could investigate each HMDS-only case. This could be done by asking hospital coders to use a form, which is already in use on a voluntary basis within hospital coding departments. The current Regulations provide for making enquiries of the relevant person in charge at each hospital (or any doctor) in an effort to collect data. Although the Registry's enquiry could be formally directed to the person in charge of the relevant hospital, it is likely that hospital coding staff may have the task of responding delegated to them. Alternatively, one could write directly to the doctor in charge of the case, or visit the hospital to view the case notes if accessible.

The burden of responding to such queries could be significant to busy clinical staff and use of case notes would be preferred, rather than writing letters. It would realistically have to be assumed that such follow-up will be unsuccessful in some cases, and a more reliable system would be preferred.

4.3.3 Active notification - Introduction of compulsory notification of cancers by hospitals

The introduction of a requirement for hospitals to pro-actively notify the Registry of all cancers diagnosed and treated by hospitals would bring Western Australia into line with the other States in terms of national comparability of cancer data. There are two major options: (a) use of a paper "form" (such as that being voluntarily used now) or (b) the addition of an electronic module to the TOPAS system or other electronic PAS (Patient Administration System) currently being used to supply HMDS data to the Department of Health, and thereby to the Registry. Either option would significantly improve the completeness of the cancer data collected in WA, and remove doubts about the 3 key data items mentioned in Section 4.3.1 above.

Any new direct notification system which did not include those items, would not be worthwhile from the Registry's viewpoint; and representations have been made on this issue in the last two years, to the persons charged with creating a "desired specification" for a new PAS. This would be the preferred option.

4.4 Impact of including HMDS data

As described in Section 4.2, the current Western Australian cancer notification system is not comprehensive in collecting all the cancer data that could be recorded. Enhanced collection of cancer data could be justified on scientific grounds for completeness of data and to enhance accuracy; there is also an argument for bringing Western Australian data collection practices into line with those of the other States and Territories in Australia.

With inclusion of HMDS data an inevitable increase in reported cancer incidence rates will occur. To prevent misinterpretation and a false impression that cancer has actually become more common in Western Australia, the reasons for such an increase would need to be explained and this issue is explored more fully in Section 4.7 of this report.

4.5 Pilot project: Potential impact of inclusion of HMDS data in the Western Australian Cancer Registry, 1985-2004

4.5.1 Project overview

The Western Australian Cancer Registry (WACR) maintains a database in which cancer records are created. The database structure includes a demographic record for each person that is then linked to a separate "pathology" record for each cancer for that person.

As a result of the examination of HMDS records for persons without a Cancer Registry record, 12779 new Registry records were created in January 2000, for 11726 persons, based on examination of HMDS data back to 1981. The process was repeated and extended in August 2000 and has since been continued to the present date. Currently over 30,000 HMDS-only records have been added to the Registry, and over 3,400 Death Certificate Only cases have been accepted as valid, based on HMDS corroboration (see Section 3.1)

A conservative approach was taken whereby not all hospital-generated codes for cancer events were used to create cancer records, with medical staff advising on situations in which different coded conditions were thought likely to in fact refer to the same disease. In the majority of cases, making allowances for non-specificity of tumour site codes, the correlation between the cancer code recorded in the clinical setting (i.e. as stated in the patient's medical record) and the cancer code entered onto the HMDS record for that patient, was generally the same.

Examination of the data revealed an "evolution" of codes in many cases; for example, a patient would initially be discharged with an "unknown primary" diagnosis and subsequently days or weeks later, be discharged with a specific cancer site code, presumably after results from further testing had become available. Later discharge dates may be accompanied by this same diagnosis and therefore be accompanied by the same cancer code several times in the following months and years, and additional cancer diagnoses were not necessarily added to the Cancer Registry for each occasion. Numbers of additional "HMDS-only" Cancer Registry records created, by year, are shown in Table 6.

Table 6. Frequency of creation of HMDS-only cancer records per year for the period 1982-2003

Year	Cases
1982	778
1983	664
1984	546
1985	363
1986	380
1987	469
1988	433
1989	512
1990	525
1991	541
1992	476
1993	559
1994	710
1995	909
1996	949
1997	1016
1998	1184
1999	1205
2000	1388
2001	1251
2002	1100
2003	1098

All cases on the Registry are updated when required in the light of new information received. For some of the 1098 HMDS-only cases created for the year 2003, such normal "passive" data enhancement processes resulted in significant change. Over 82% remained unconfirmed, however 3.5% were confirmed by pathology reports received, 0.7% were later found to have been diagnosed by imaging or clinical methods, and 13% were confirmed by the "cause of death" text on a mortality record (Table 7).

Thus, for 2003, the 82.7% non-confirmed cases, or over 900 possibly-correct records, were not included in official cancer incidence statistics due to a lack of further information.

Table 7. Breakdown of change of status of HMDS-only cancer records for 2003

Basis Of Diagnosis		Total	%
1	Histology	26	2.4
2	Cytology	6	0.5
3	Haematology	7	0.6
4	Imaging	7	0.6
5	Clinical	1	0.1
7	Surgical	1	0.1
D	Death Notification	138	12.6
H	(remain) HMDS-only	908	82.7
U	Unknown basis of diagnosis, but definitely cancer	4	0.4
	Total	1,098	100

4.5.2 Changes in reported numbers of cases of specific cancers

Inclusion of HMDS-only cancer records would result in an increase in the number of cancer cases reported by the Registry, and in Western Australian cancer incidence rates, and the increases would be different for different types of cancers. The WACR database is continually updated as new information is received, and the numbers of cases on record at a given time will differ from those in reports published at an earlier date. However, a statement about changes would need to accompany the release of any new WA cancer statistics which included uncorroborated HMDS-only cancer records. Incorporation of such information in WACR reports and in specific advice to regular users of WACR data may be sufficient for this purpose.

4.5.3 Percentage change in case numbers for recent years (2003-2004)

All cancers

The annual all-cancers case numbers between 1985 and 2004 could be expected to increase by between 6% and 13% if the HMDS-only cancer cases are included (Table 8). It is indicated in the table below that for the 20 year time period 1985-2004, potentially 11,455 cancer records could have been included in the Registry statistics - if HMDS-only data were thought to be reliable enough for inclusion.

Table 8. All cancers combined in Western Australia (excluding non-melanoma skin cancer): percentage change in case numbers based on possible inclusion of HMDS-only cancer records, 1985-2004. (data as at February 2005)

Year Cancer	Type of record		Change	Note
Diagnosed	Normal	**HMDS**	%	
1985	4518	**281**	6.2	
1986	4644	**280**	6.0	
1987	4889	**365**	7.5	
1988	5093	**328**	6.4	
1989	5188	**400**	7.7	
1990	5322	**422**	7.9	
1991	5693	**432**	7.6	
1992	5997	**375**	6.3	
1993	6488	**455**	7.0	
1994	7195	**583**	8.1	
1995	7336	**731**	10.0	
1996	6971	**752**	10.8	
1997	6693	**787**	11.8	
1998	6838	**887**	13.0	
1999	7600	**827**	10.9	
2000	7578	**811**	10.7	
2001	7845	**728**	9.3	*1*
2002	8623	**644**	7.5	*1*
2003	8653	**795**	9.2	*1*
2004	8159	**572**	7.0	*2*
Total HMDS in 20 yrs		**11455**		

Notes:
1. Recent cases – many will eventually be confirmed by a death notification
2. Incomplete year

Common cancers

Among the most commonly recorded cancers in Western Australia (i.e. prostate, breast and colorectal cancers, melanoma of the skin, and lung cancer) the addition of HMDS-only cancer records would be expected to change the total number of cases by 5% or less (Table 9).

A large change (~23% increase) would be expected for **leukaemia** and **myeloma** as a result of the continual difficulty experienced in obtaining reports for haematological tests from pathology laboratories. This is discussed as a special case below (Section 4.5.4).

Inclusion of HMDS-only cases would result in large changes for bladder (+ 32.4%) and moderate changes for renal tract cancers (+ 6.8%). These are thought to be due to staff responding to non-specific wording of the diagnosis (e.g. "TCC bladder") by recording all such cancers as invasive cancers when this is often not the case. There can be a lack of information to help clinical coders differentiate between invasive bladder carcinomas and *in situ* bladder carcinomas. Later in this report it will be noted that although some of the projected increases are large, Western Australia's apparent incidence rate would be by no means the highest in Australia as a result.

The percentage difference for "other lymphohaematopoietic neoplasms", 145.8%, is so high largely because adequate notification of these cases is still to be achieved. For the purposes of reporting cancer statistics, these have only been regarded as true malignancies since 2000, and changes in reporting by haematologists can be expected to take some time.

Table 9. Common cancers in Western Australia: percentage change in incident case numbers, by cancer type, 2003-2004, based on possible inclusion of HMDS-only records (data as at February 2005)

(a) Sorted by cancer frequency:

Cancer	**Normal**	HMDS included	Diff	% Diff	Note
Prostate gland	**2646**	2751	105	4.0	*1*
Breast	**2179**	2241	62	2.8	
Colorectal cancer	**2075**	2175	100	4.8	
Melanoma (skin)	**1932**	1976	44	2.3	
Lung, bronchus & trachea	**1464**	1538	74	5.1	
Lymphoma	**716**	768	52	7.3	
Unknown primary site	**586**	651	65	11.1	
Kidney & other renal tract	**411**	439	28	6.8	
Leukaemia	**377**	465	88	23.3	*2*
Urinary bladder	**339**	449	110	32.4	*3*
Lip	**291**	324	33	11.3	
Pancreas	**284**	320	36	12.7	
Stomach	**281**	297	16	5.7	
Thyroid gland	**270**	291	21	7.8	
Corpus uteri	**263**	267	4	1.5	
Ovary, uterine adnexa & other female gen.	**243**	261	18	7.4	
Brain	**239**	261	22	9.2	
Oesophagus	**238**	245	7	2.9	
Other lymphohaematopoietic neoplasms	**192**	472	280	145.8	
Myeloma & plasma cell tumours	**172**	213	41	23.8	
Non-melanoma skin cancer (exc. SCC/BCC)	**166**	168	2	1.2	
Cervix uteri	**161**	167	6	3.7	
Testis	**147**	154	7	4.8	
All cancers	**16812**	18179	1367	8.1	

Notes:
1. Prostate cancer incidence continues to decline from 1995 peak incidence.
2. Leukaemia – many will eventually be supported by death records.
3. Urinary bladder – suspected to include many non-invasive cases.

Table 9. (cont.)
(b) Sorted by magnitude of possible change in case numbers:

Cancer type	%Difference
Other lymphohaematopoietic neoplasms	145.8
Urinary bladder	32.4
Myeloma & plasma cell tumours	23.8
Leukaemia	23.3
Pancreas	12.7
Lip	11.3
Unknown primary site	11.1
Brain	9.2
Thyroid gland	7.8
Ovary, uterine adnexa & other female genital	7.4
Lymphoma	7.3
Kidney & other renal tract	6.8
Stomach	5.7
Lung, bronchus & trachea	5.1
Colorectal cancer	4.8
Testis	4.8
Prostate gland	4.0
Cervix uteri	3.7
Oesophagus	2.9
Breast	2.8
Melanoma (skin)	2.3
Corpus uteri	1.5
Non-melanoma skin cancer (exc. SCC/BCC)	1.2
All cancers	8.1

Cancers showing greatest change when HMDS data are included

For a number of relatively uncommon cancers, case numbers show a large proportional increase as a result of inclusion of HMDS-only cancer records. For some of these (see Table 10, *Note 1*) there would be no appreciable impact on overall cancer incidence statistics as the actual number of cases is small.

For Kaposi sarcoma, any impact would be limited to recent years, as no separate code for Kaposi sarcoma was available for use prior to the mid 1990s.

The percentage differences for bladder cancer and leukaemia are high and the actual number of cases is considerable (Table 10).

For other cancers, such as myeloma, the proportional difference is high and the difference in actual case numbers is much smaller. For myeloma, with a large 23.8% expected increase, the underlying reasons are likely to be similar to those experienced with leukaemia, namely the difficulty in obtaining adequate notification of the diagnosis confirmed by haematological testing.

Table 10. All cancers, Western Australia, 2003-2004: sorted by magnitude of change in incident case numbers, based on possible inclusion of HMDS-only records (data as at February 2005)

Cancer	Normal	HMDS	Diff	% Diff	Note
Other lymphohaematopoietic neoplasms	192	472	**280**	145.8	
Urinary bladder	339	449	**110**	32.4	
Prostate gland	2646	2751	**105**	4.0	
Colorectal cancer	2075	2175	**100**	4.8	
Leukaemia	377	465	**88**	23.3	
Lung, bronchus & trachea	1464	1538	**74**	5.1	
Unknown primary site	586	651	**65**	11.1	
Breast	2179	2241	**62**	2.8	
Lymphoma	716	768	**52**	7.3	
Melanoma (skin)	1932	1976	**44**	2.3	
Myeloma & plasma cell tumours	172	213	**41**	23.8	
Pancreas	284	320	**36**	12.7	
Lip	291	324	**33**	11.3	
Kidney & other renal tract	411	439	**28**	6.8	
Brain	239	261	**22**	9.2	
Kaposi sarcoma	6	8	**2**	33.3	*1,2*
All cancers	16812	18179	**1367**	8.1	

Notes:
1. Very low total case numbers, unreliable, low impact on overall picture.
2. No code for Kaposi sarcoma until mid 1990s.

Cancers with little or no change when HMDS data are included

For some cancers, inclusion of HMDS-only cases would result in a very low percentage change (less than 1.5%) (uterine cancer and non-melanoma skin cancer), and/or a very small number of additional cases (larynx, adrenal, nasopharynx, small intestine and oral/ pharyngeal tumours), suggesting relatively good notification of these cancer.

4.5.4 Historical view: time trends in cancer case numbers from 1985-2004

Patterns of change

For the purposes of this discussion, from amongst the graphical time-trend presentations considered in the original Discussion Paper, three major types of trends have been identified and will be illustrated here.

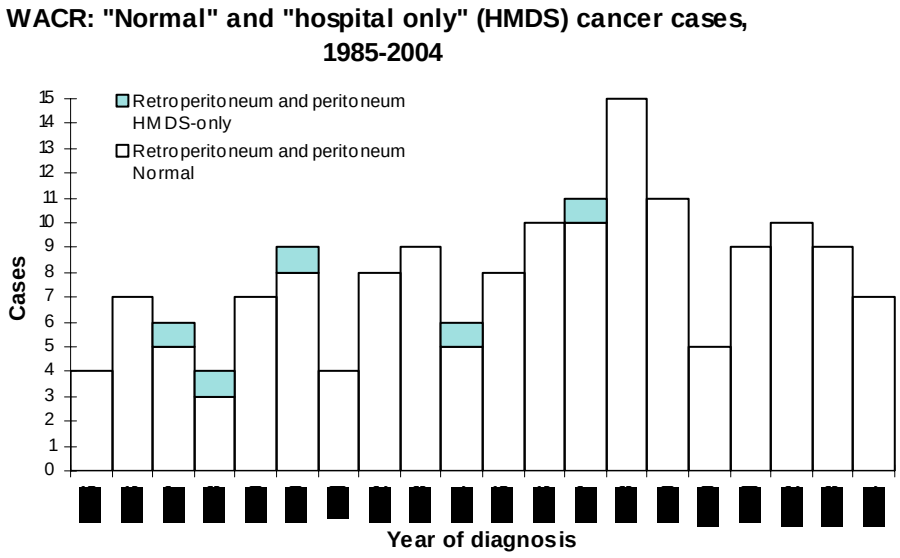
Pattern 1: *Little change, sporadic occurrence of new cases, little impact on statistics*
e.g. *Figure 1*: Retroperitoneum & peritoneum.

Pattern 2: *Small and relatively consistent increases*
e.g. *Figure 2*: Lung cancer and Colorectal cancer.

Pattern 3: *Moderate to large increases in common cancers, more marked in recent years*
e.g. *Figure 3*: Leukaemia and Myeloma (including other plasma cell tumours).

Pattern 1: example

Figure 1. Changes in apparent numbers of incident cancer cases, Western Australia 1985-2004, based on possible addition of HMDS-only cancer cases for retroperitoneum and peritoneum.

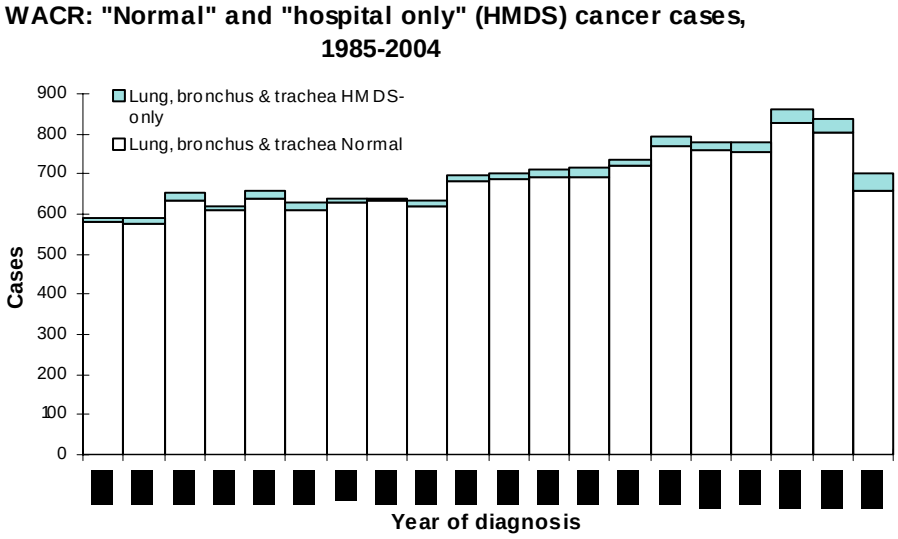


Pattern 2: examples

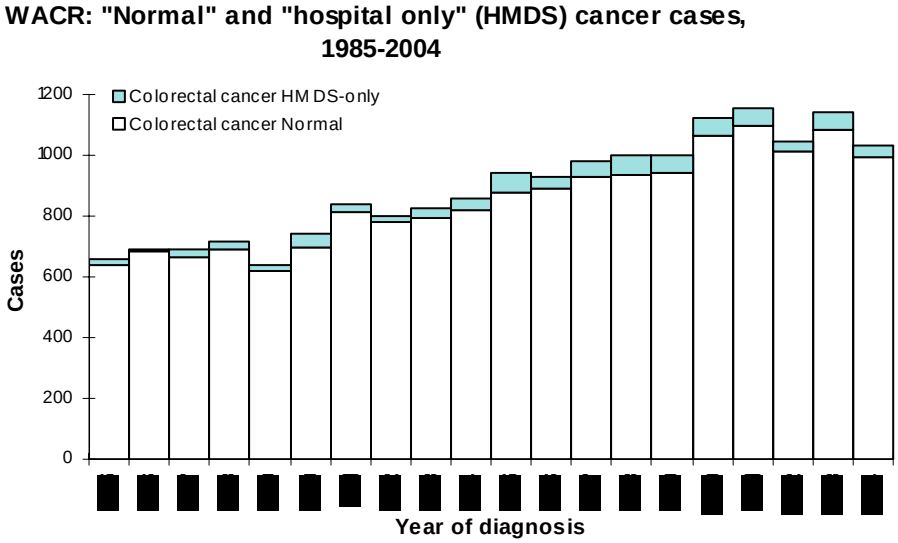
Lung and colorectal cancers are good examples of types for which pathological notification is good, but for which there are a significant number of cases being diagnosed by other methods such as imaging.

Figure 2. Changes in apparent numbers of incident cancer cases, Western Australia 1985-2004, based on possible addition of HMDS-only cancer cases for (a) lung and (b) colorectal cancers.

(a) Lung cancer



(b) Colorectal cancer

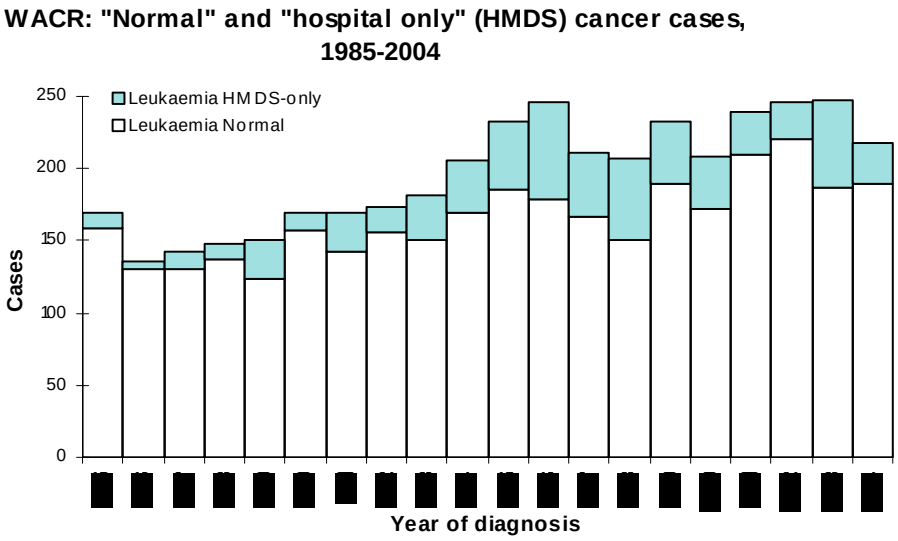


Pattern 3: examples

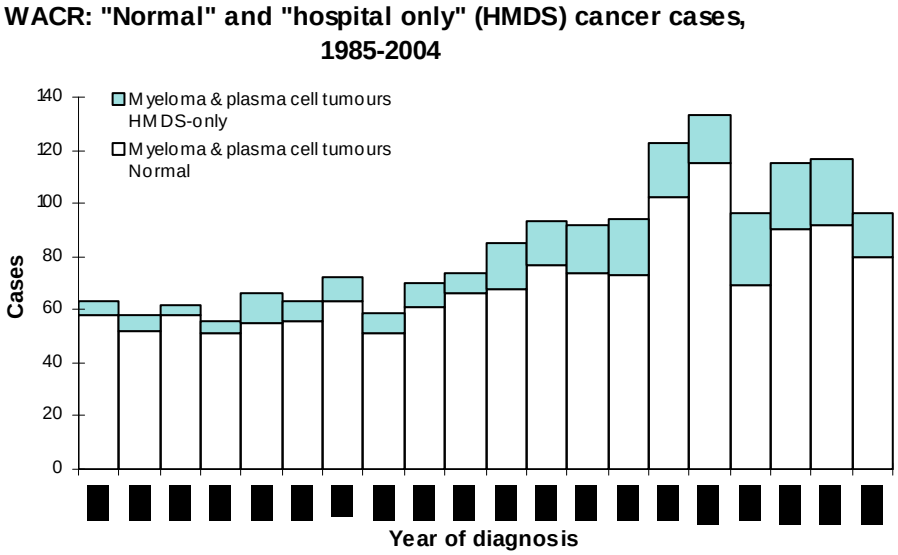
Leukaemia and myeloma are good examples of cancers which the Cancer Registry often becomes aware of, long after their diagnosis date. Older data progressively "improve" with time, and it is the most recent data that display the largest potential problems (Figure 3).

Figure 3. Changes in apparent numbers of incident cancer cases, Western Australia 1985-2004, based on possible addition of HMDS-only cancer cases for (a) leukaemia and (b) myeloma.

(a) Leukaemia



(b) Myeloma



Interpretation and implications

Cancers showing potential changes like **Pattern 1** have little impact on overall cancer incidence statistics but omission of HMDS-only cancer records could affect specific cancer statistics and survival analyses. The overall quality of data can be expected to be maintained using existing methods but 100% completeness would be preferred.

Cancers showing **Pattern 2** changes are generally those cancers where notification is already well-established, and relevant pathology reports will have been received. It is likely that the majority of the additional cases are those in which a diagnosis has been established by clinical or radiological methods. For some cancers - the examples given above, and others such as pancreatic and biliary tract cancers - non-pathological diagnosis is relatively common, and a significant proportion of cases are "missed" using only current systems.

Leukaemia and myeloma in particular represent examples of **Pattern 3** (Figure 3). In this group, the automatic inclusion of HMDS-only cases would have a significant impact on Western Australian cancer statistics. This would be less likely if the Registry reliably received diagnostic haematology reports for all notifiable conditions. However this remains a problem even since the Regulations were amended to specifically mention haematology in 1996. The number of haematology tests performed is very large, and implementation of a computerized report-selection process may offer the best solution.

The time-series for leukaemia cases arranged by year of diagnosis (Figure 3a) shows that the proportion of HMDS-only cases is greatest in the most recent years. The HMDS-only cases are evident on the graphical presentations as a “wedge” on top of the “normal” cases, becoming progressively thinner from right to left. Changes in medical practice in recent years may have contributed to the increased numbers in recent years. However, examination over time suggests that this thinning of the "wedge" is largely due to ongoing receipt of information from other sources, such as the death notification system. However, this is often long after diagnosis and data are inevitably less precise, the people concerned cannot be included in research studies even if they had been willing, and more timely notification is to be preferred.

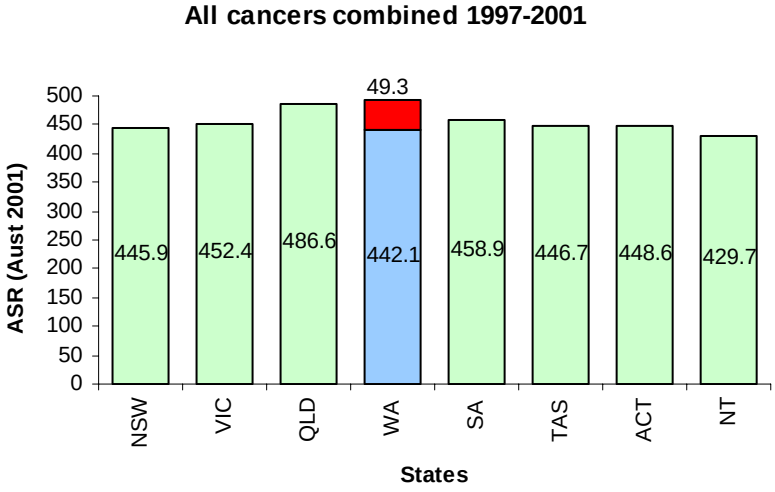
Inclusion of HMDS-only cancer cases in incidence data for Pattern 3 cancers in particular would be an important step in reducing the current bias towards the collection of cases in which a cancer proves fatal and is mentioned on a death certificate.

4.5.5 Impact on comparisons with interstate incidence rates

Overview of comparisons

By comparing the cancer incidence statistics of Western Australia to those of the other states, the impact of adding the HMDS-only cancer records to the Registry can be illustrated. The Age Standardized Rates (ASR) for incidence between 1997-2001 used in this comparison have been sourced from the Australian Government report *Cancer in Australia 2001* (published December 2004). It should be noted that these ASRs are based on the *Australian 2001 Population Standard*, rather than the *World (1960) Population Standard* as is commonly used in reports published by cancer registries in Western Australia and other States.

Figure 4. Changes in Western Australian and other Australian 1997-2001 cancer incidence, based on possible inclusion of HMDS-only cancer cases: all cancers combined.

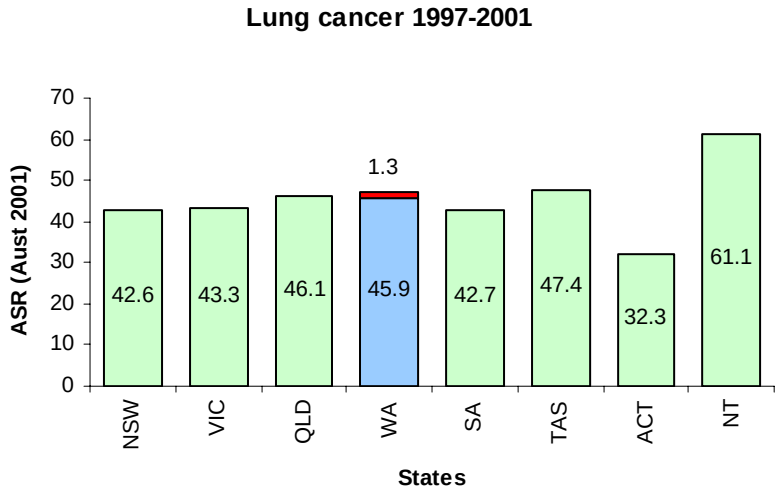


WA's ranking compared to the other states would increase from 7th to the highest rank after the inclusion of all HMDS-only records.

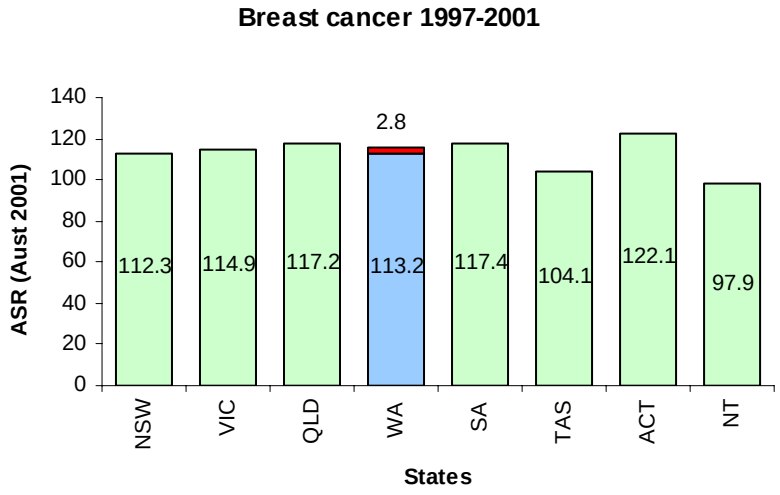
Specific cancers

After the addition of HMDS-only cancer records, Western Australia's incidence rate for 1997-2001 would have been among the top three highest ranking states in Australia for lung cancer, breast cancer, cervical cancer and pancreatic cancer (see Figures 5 and 6). For lung and breast cancers the potential changes in incidence are minimal after adding the HMDS-only cancer cases (2.8% and 2.5% respectively). Cervical and pancreatic cancers showed larger increases (6.8% and 7.1%) and rankings would be affected more markedly.

Figure 5. Changes in Western Australian and other Australian 1997-2001 cancer incidence, based on possible inclusion of HMDS-only cancer cases: lung cancer and breast cancer.

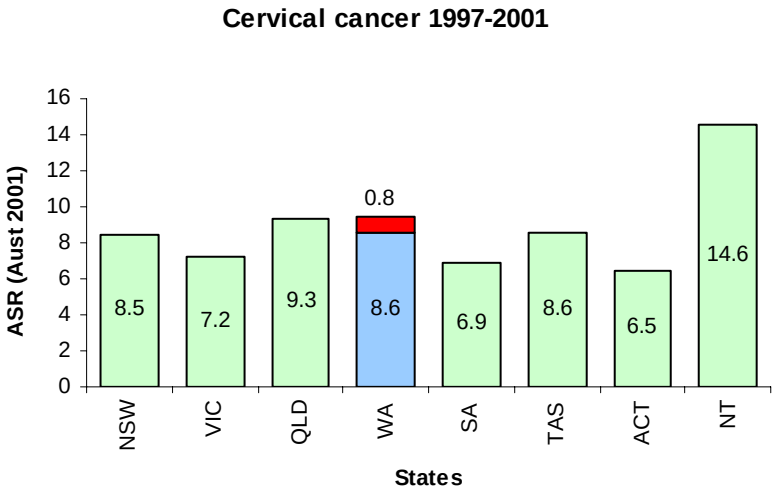


WA's ranking would rise from 4th to 3rd highest after the inclusion of HMDS-only records.

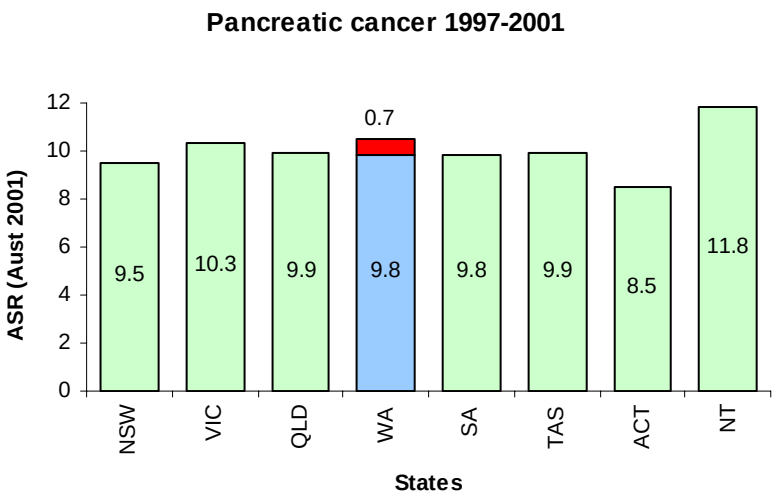


WA's ranking would rise from 5th to 4th highest after the inclusion of HMDS-only records.

Figure 6. Changes in Western Australian and other Australian 1997-2001 cancer incidence, based on possible inclusion of HMDS-only cancer cases: cervical cancer and pancreatic cancer.



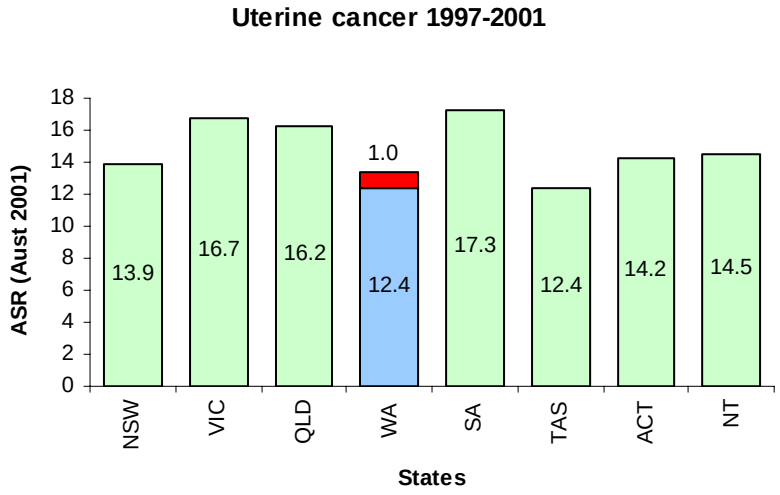
WA's ranking of equal 3rd with Tasmania would rise to 2nd highest after the inclusion of HMDS-only records.



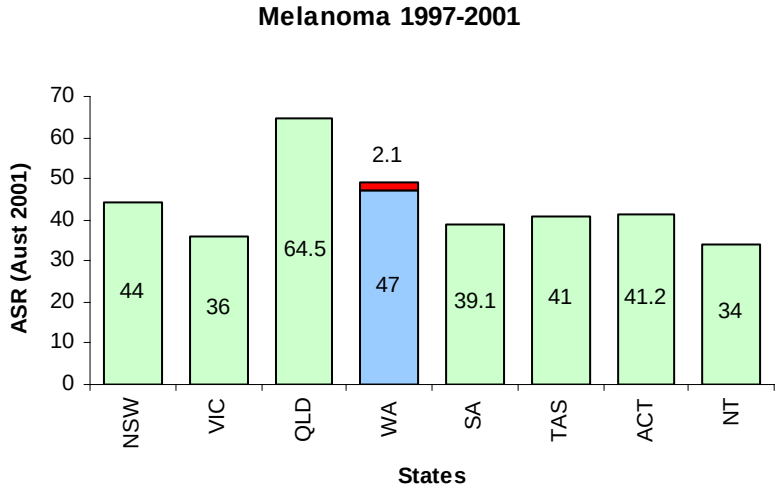
WA's ranking of equal 4th with South Australia would rise to 2nd highest after inclusion of HMDS-only records.

For some other common cancers (e.g. uterine cancer and cutaneous melanoma), the Western Australian incidence rate would remain lower than that in some other States and rankings would be essentially unchanged (Figure 7).

Figure 7. Changes in Western Australian and other Australian 1997-2001 cancer incidence, based on possible inclusion of HMDS-only cancer cases: uterine cancer and skin melanoma.



After inclusion of HMDS-only records the ASR would increase from 12.4 to 13.4 but the overall ranking would remain the same at 7th.

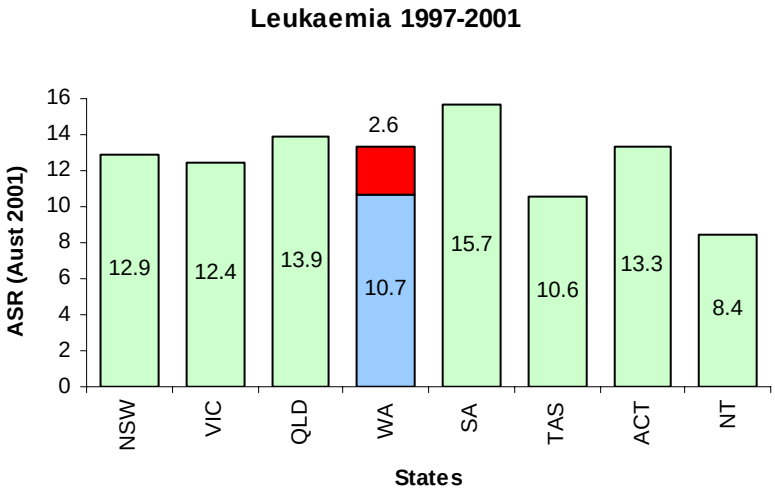


Inclusion of the HMDS-only records would not result in any change in WA's rank in comparison to the other states.

The largest potential change in ranking based on the inclusion of HMDS-only cases is seen for leukaemia (Figure 8), with the Western Australian incidence rate changing substantially, and its ranking amongst areas moving from sixth to equal third highest. This is consistent with previous comments about ascertainment made in Section 5.4.2.

This large difference is potentially important, as interstate differences in cancer rates have been the subject of high-level enquiries such as Parliamentary Questions. In dealing with such enquiries about leukaemia in particular, care has had to be taken that an apparently lower incidence rate in Western Australia is not claimed as evidence of a healthier environment, as it is arguably most likely to be a result of the inadequate notification of cancer cases.

Figure 8. Changes in Western Australian and other Australian 1997-2001 cancer incidence, based on possible inclusion of HMDS-only cancer cases: leukaemia.



WA's ranking would increase from 6th to equal 3rd highest with the Australian Capital Territory after the inclusion of HMDS-only records.

4.6 Impact of improving data capture practices

4.6.1 Impact on Western Australia's cancer statistics

The inclusion of HMDS-only cancer case records would increase the apparent incidence of cancer in Western Australian. This increase would need to be explained in appropriate detail, to the various users of Registry data.

For some of the most common cancers the impact would be low due to a current good level of ascertainment (Section 4.5.4). For some, the impact on recent-year incidence rates would be high, via a bringing-forward of many cases about which the Registry would eventually be notified. For others, there would be additional cases that the Registry would never otherwise be able to report. Some would affect inter-State rankings, others would not.

A separate and important issue is the quality of the information contained in HMDS-only cancer records. It would be unwise to un-critically accept hospital-coded records alone as a substitute for properly-documented cancer notifications.

4.6.2 Resourcing

At present, Registry staffing levels are adequate to permit the continuation of the current processes as well as processing and recording new cases from the HMDS as described in this paper, provided there is -

- Continued support from the Data Linkage Unit to remove the need for Registry staff having to match over 100,000 new cancer-related discharge records from the HMDS each year;
- No requirement for active follow-up of all previously unknown cancer cases.

4.6.3 Timeliness

High quality data linkage outcomes are available due to the services provided by the Data Linkage Unit. However, if there are long delays between notification of cancer cases and active follow up, successful recovery of further information regarding the cancer case is less likely as hospital case notes may be archived.

Among the remaining cases, those for whom information is obtained, a proportion will eventually be determined as correctly belonging on the Registry of another State and not Western Australia. The Western Australian Cancer Registry is more up-to-date than many other cancer registries, permitting reporting of more recent data. However, the more timely the reporting, the more statistics are subject to change after publication, in the light of new information.

4.7 Conclusion and recommendations

4.7.1 Future options

A revision of the State's Cancer Notification Regulations was anticipated at the time this paper was written; avenues of accessing hospital data were expected to be considered.

Options for improving data completeness include -

1. The incorporation of HMDS-only cancer records as described in this paper, in conjunction with the existing use of the Hospital Notification Of Cancer Form used on a voluntary basis by some hospital coders (i.e. accepting HMDS-only cases as valid, reliable and reportable in WA statistics);
2. Instigation of the mandatory use of a Hospital Notification of Cancer Form, preferably in an electronic format (while ignoring the HMDS-only cases)
3. Alteration of the HMDS database to include a cancer module, which would include the key additional data fields: **date of diagnosis**, **patient's residential address at the time of diagnosis**, and the **basis of diagnosis** - which would lend much authority to the coded records received, and facilitate judgments as to their relevance.
4. Active follow-up of HMDS-only records, updating the Registry with any results, and including any confirmed cases in incidence statistics.

Of these four options, (4) may provide the most accurate data but would require the most work for the Registry; (1) may be the easiest but risks reliance on unproven data. The issue of data quality is explored in Section 5 of this report.

4.7.2 Public and other user relations

Documentation would be required explaining the changes in cancer data collection procedures undertaken by the Western Australian Cancer Registry and the reasons for the changes.

Such documentation would ideally appear in Cancer Registry publications, however may need to involve other Department of Health staff up to Ministerial level, depending on the magnitude of changes at any given time.

4.8 Bibliography

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5. Investigation of quality of HMDS-only cancer data, 2004

5.1 Planning and preliminary findings

HMDS-only records on the WA Cancer Registry database were assessed, and a sample of 20 were selected, in hospital discharge date order, from each of two Metropolitan Teaching Hospitals, and files were assessed via the usual Cancer Registry access arrangements already in place. The Principal Medical Officer accompanied the Project Officer on the first hospital visit.

Examination of the 36 files available showed that the Cancer Registry would have found over 80% of the records relevant, and that as many as 71% of files indicated a "missed" pathology notification (Table 11).

Table 11. Outcomes of preliminary investigation of "HMDS-only" cancer records from two hospitals.

Hospital	Date	Time (hours)	Files viewed	**Result:** Relevant to WACR -	Missed pathology
1	2/3/05	2.5	19	89% of cases	8 (42%)
2	30/3/05	3.5	17	82% of cases	12 (71%)

It was determined from these findings that it would be worthwhile proceeding with a fuller investigation of such HMDS-only cases, and to widen the scope to include data from other public teaching hospitals.

5.2 File examination at three hospitals

5.2.1 Selection of records

The sample for the audit comprised approximately 228 records of patients with cancer who had been admitted to the three metropolitan general teaching hospitals during 2004. Several restrictions were observed in the selection of cases:

(1) The only benign cancers included in the sample were those of the central nervous system;
(2) The only "uncertain behaviour" neoplasms included were those of the ovary;
(3) Skin squamous cell carcinomas (SCC) and skin basal cell carcinomas (BCC) were not included, but all other SCC were included.

The most common cancers included in the sample were prostate (10%), lung (7%), colorectal (6%) and bladder (5%) cancers, myelodysplastic syndromes (8%) and benign central nervous system tumours (13%).

All hospitals had a significant number of lymphohaematopoietic neoplasm cases that appeared to require examination (at least 20% of the "HMDS-only" cases at each hospital). New ICD-03 coding guidelines have resulted in some disorders now being reclassified as malignant. Whilst the reporting of these is now legislated for, reporting systems are not yet in place in all laboratories to ensure their prompt notification to the Registry.

5.2.2 Methods

Patient medical records were reviewed at metropolitan public hospitals to confirm the accuracy of the cancer coding entered on the HMDS. If, after this, further information was still required to establish with confidence the accuracy of the coding, an attempt was made to contact the relevant clinicians by letter or telephone, asking for clarification of the diagnosis.

Lists of approximately 25 cases for review were compiled at a time, and files requested for viewing at the relevant hospital. Each list was expected to take 3 hours for review. A project officer examined the accuracy of the cancer coding on each HMDS record, as judged from the information in the patient's medical record for the relevant hospital admission.

Available data for each patient were reviewed with the Principal Medical Officer or the Coding Advisor in the Cancer Registry. Once the accuracy of the coding had been verified, the relevant Cancer Registry records were updated to reflect any new information.

5.2.3 Estimated costs

Tasks in this project included utilizing electronic files at the Registry, examining case notes at hospital Medical Records departments, and presenting the findings of the audit. There were a number of factors to consider in terms of resources required to accomplish the audit. These included staffing, funding, transport, stationery, access to computers, telephones and faxes. Administrative costs were minimal as the Registry provided stationary and photocopying at the hospitals incurred no expense. Fleet cars needed to be booked in advance to ensure availability in travelling to and from hospitals on designated days, and taxi vouchers were occasionally required. Time, both in office and out of the office, was the most costly factor in completing the audit.

On average, a novice researcher could review a patient hospital file in approximately 9 minutes to determine if the cancer code entered on the HMDS was confirmed by the findings as reported in the patient's medical records. Theoretically therefore a novice researcher could review approximately 20 files in 3 hours. However, it should be noted that on occasion a file would require longer than 9 minutes to review.

Actual time allocations required for carrying out such research in an operational setting include:

- Travel time to and from hospitals (~ 1 hr per trip to and from hospital)
- Preparing lists of records to review (~ 1 hr per trip to hospital)
- Investigation time (~ realistically 4 hrs per trip to hospital)
- Verifying with a Registry Medical Officer (2 hrs per trip to hospital)
- Processing of results from reviewing sessions (1 hr per trip to hospital)
- Analysing and reporting on audit results (ongoing).

Time taken in verifying and processing of outcomes would be expected to reduce with the development of procedures and with increasing familiarity with the files in different hospitals.

5.2.4 Results

Availability of files

Cancer coding for 228 HMDS events were selected for review at the respective hospital medical records department. Unfortunately, within the designated time period allocated for this project, 18 patient files were unavailable for review and therefore a total of 210 records comprised the sample pool and were subsequently reviewed (Table 12).

Table 12. HMDS-only cancer case files reviewed at three Perth Metropolitan public hospitals

Hospital	Files Reviewed	Files Unavailable	Total
1	106	3	109
2	56	12	68
3	48	3	51
All	210	18	228

Western Australian residency

Of 210 files reviewed, 9 were determined to relate to non-WA residents (2 from overseas and 7 from interstate), the remaining 201 appearing to be WA residents.

Impact on Western Australian cancer incidence statistics

Of the 210 cases reviewed, 131 would have been included in the incidence statistics for WA if they had been reported to the Registry. In 64 instances a pathology laboratory apparently failed to notify the Registry of a cancer diagnosis, though required to do so under the current notification regulations. These represented 30.5% of these HMDS-only cases.

However, 56 cases were not previously known to the Registry for a specific and understandable reason - for example, diagnosis by clinical or by imaging methods. These missed cases suggest a need for broadening of the scope of legal notification requirements.

Errors in coding

Of the 210 HMDS records reviewed, 28 concerned coding for benign tumours; 5 for borderline tumours, 168 for invasive malignancies ("cancers") and 9 for non-invasive malignancies (*in situ* neoplasms).

After reviewing patient medical records at the respective hospitals, it was determined that of these 210 records -

- 16 records could not verify the relevant person as having any neoplasm
- 29 records should have been coded as benign tumours
- 141 records should have been coded as invasive malignant cancers
- 12 records should have been coded as non-invasive malignancies
- 4 should have been coded, at best, as "suggestive of" a neoplasm.

In summary, of 210 hospital records with code/s relating to a neoplasm of interest, 43 were determined to be in error: 16 records could not be verified as having any neoplasm and 27 were confirmed as needing a code for a neoplasm, but a different one. These errors did not appear to differ systematically by hospital, within the three hospitals visited. The results are presented in Table 13.

Table 13. Breakdown of HMDS-only cases for 2004: based on coding of cases according to the HMDS versus the coding of the same cases after researching the hospital medical records

Based on HMDS Coding		Post-research determination	
28	Benign	16	Not neoplasm
5	Borderline	29	Benign
168	Malignant invasive	8	Borderline
9	Malignant non invasive	141	Malignant invasive
		12	Malignant non invasive
		4	Suggestive of cancer
(210)	All	(210)	All

Basis of diagnosis

From the review processes undertaken in this project, it was determined that 62% of the reviewed HMDS-only cases for 2004 had had a microscopic diagnosis, most of them histological (Table 14).

Table 14. Basis of diagnosis of "HMDS-only" cancer cases for 2004, as determined from hospital file review

	Hospital				
Basis of Diagnosis	**1**	**2**	**3**	**All**	%
Histology	56	35	18	**109**	51.9
Cytology	7	2	5	**14**	6.7
Haematology	4	1	3	**8**	3.8
Imaging	15	5	5	**25**	11.9
Clinical	4	2	1	**7**	3.3
Biochemical/Immunological	1	0	0	**1**	0.5
Surgical	2	0	0	**2**	1.0
Unknown	10	8	10	**28**	13.3
No tumour confirmed	7	3	6	**16**	7.6
Total	106	56	48	**210**	(100)

Date of diagnosis

After researching patient medical records, 137 of 210 HMDS-only cases (65%) were found to have diagnosis dates earlier than the hospital discharge date recorded on the HMDS records.

For 25 of these cases, the true date of diagnosis was determined to be in a year prior to 2004.

For confirmed tumours with different diagnosis dates that were still in 2004, the mean difference was 21 days, the median 9 days, and 8 cases were found to have been diagnosed more than 60 days prior to the discharge date on the HMDS record.

Results for different tumour types

In Table 15, the outcomes of file examination are shown for the most common "invasive malignancies" among the cancer types chosen for review.

For many, there was an indication that there were significant numbers of non-pathological diagnoses being made, or cases whose pathology reports were not being reported as required.

- **Breast cancer** records (9) were all found to be correct, and all would have been valid WA cancer cases for reporting purposes; 8 of 9 cases had been diagnosed histologically.
- **Myeloma** records (5) were likewise correct, but only 2 had been diagnosed by microscopic methods.
- **Lymphoma** and **leukaemia** records (8 of each) were all found to be correct. Evidence suggested that a tissue diagnosis had been obtained for only 4 leukaemia cases, but for 7 lymphomas.
- **Liver cancer** diagnoses (5) were supported by hospital notes in all cases, but all were based on imaging or unknown methods.
- **Pancreatic cancer** cases (6) were all confirmed by notes, but only 2 had had a tissue diagnosis.
- Most **lung cancer** cases were confirmed by hospital notes (13 of 14), but only 7 had a tissue diagnosis documented in those notes.
- Of the 12 **colorectal cancer** cases examined, 9 appeared to have had an un-notified tissue diagnosis (one being made in another State).
- Most **myelodysplastic syndrome** records were correct, 13 of the 14 confirmed cases having had an un-notified microscopic diagnosis.

Results for some other cancers were more indicative of data quality problems.

- Of the 5 **polycythaemia rubra vera** cases considered, only 3 were confirmed as genuine neoplasms, the others being mis-coded.
- Of greatest concern, however, were the **bladder cancer** cases (12), of which only 9 were confirmed as cancer cases of any kind, and of which only 5 were confirmed as invasive malignancies reportable in Western Australians. The most common cause of discrepancy was the use of an "invasive" code where "in situ" was indicated by the material in the file.

Table 15. Outcomes of follow-up for 2004 "HMDS-only" records (invasive malignancy codes only, types with 5 or more cases examined)

Cancer type	Examined	No cancer confirmed	Some cancer confirmed		Reportable "WA cancers"	
			Cases	%	Cases	%
Prostate	21	3	18	86	14	67
Myelodysplastic diseases	17	2	15	88	14	82
Lung	14	1	13	93	13	93
Colorectal	12	1	11	92	10	83
Bladder	12	3	9	75	5	42
Breast	9	0	9	100	9	100
Leukaemia	8	0	8	100	6	75
Lymphoma	8	0	8	100	7	88
Polycythaemia	8	3	5	63	5	63
Pancreas	6	0	6	100	6	100
Liver	5	0	5	100	5	100
Myeloma	5	0	5	100	5	100
Thyroid	5	1	4	80	4	80
All "cancers"	167	16	151	90	130	78

5.2.5 Conclusions

It has been determined from this study of public hospital files that most (92.4%) "HMDS-only" Cancer Registry records do indeed relate to real cases of cancer types warranting inclusion in the cancer statistics for Western Australia. As this proportion is so high, the continued use of the HMDS data in lieu of an active system should be considered as a viable method of aligning the cancer notification sources in Western Australia more closely with those elsewhere in Australia.

It should be noted that creation of "HMDS-only" Cancer Registry cases could be minimized if a system were in place to detect failure or breakdown in pathology laboratories' systems for notification to the Registry. Pathology reports are monitored by the Registry, however ensuring a rapid response to problems that are observed is not within the power of the Registry.

While the results here might suggest that the cancer data for some cancers could be extracted from the HMDS and used without further verification, there are serious discrepancies in coding which confirm that doing so without at least engaging in a validation procedure of some description, would be unwise.

Although the further examination or validation of HMDS data is time-consuming it is not impractical to execute. Staffing and resources need to be available and structured efficiently to perform ongoing audits of HMDS based cancer cases.

5.3 Further case research using files and enquiry letters

5.3.1 Methods

Basis of project

Building on the first Graduate Development Program project detailed in Section 5.2, a more extensive investigation was planned with the methods varied as follows:

- Inclusion of all remaining Year 2004 "HMDS-only" Cancer Registry cases in the process (excluding those whose files had been previously requested and not obtained)
- Restricting the enquiries to supposedly invasive malignancies or "cancers" (as these have most impact on official published Western Australian cancer statistics)
- Inclusion of one major private hospital in the "case file research" process (as previously determined by Cancer Registry staff, many other private hospital notes do not contain significant useable information; the bulk being maintained in the consulting rooms of private medical practitioners);
- Writing of enquiry letters to doctors regarding patients in all other hospitals (as it was neither cost-effective nor feasible to travel to small or distant hospitals)
- Elimination of invasive bladder cases from file request lists (as the return for these cases was found to be so poor in the first project).

Maintenance of lists

A list of 692 HMDS-only cases was created from Cancer Registry records, and maintained in Excel spreadsheets which were used as sources for file-request lists and mail-merge documents, as well as for recording and collation of results. Inclusion of demographic and medical practitioner details from the Cancer Registry's medical practitioner database, facilitated the process; specific additional comments about known issues were incorporated for particular cancers (such as invasive versus *in situ* status for bladder cancers).

Hospital file research was preferred where practicable, to minimize clinician workload (see Section 4.3.2). Of the 692 supposed cancer cases considered, 28% (193 cases) were researched via hospital file requests (if the person concerned had been a patient in one of four Teaching or major private hospitals), and the remaining 72% (499 cases) were the subject of enquiry letters.

Letters were sent to alternative addresses or practitioners in cases of non-delivery or an indication from a doctor that they were not the best information source. Reminder letters were sent for outstanding "enquiry letter" cases after approximately 60 days in most cases.

Hospital files were requested for in-hospital viewing using small batches as previously described in Section 5.2.

Classification of outcomes

Results of enquiries were reviewed individually with the Cancer Registry medical consultant and/or coding advisor, and a set of grouping codes was used to enable a summary of the outcomes. These codes took into account both the accuracy of the information, and its relevance to Western Australian invasive cancer incidence statistics.

5.3.2 Results

Types of outcomes

A wide range of situations was revealed in this investigation, ranging from un-notified cases without apparent reason, to cases in which reasons for non-report of valid tumour records, or mis-coding were apparent. Unfortunately there was also a high proportion of cases that were not able to be resolved. Detailed outcomes are summarized in Table 16.

The most common specific outcome was the discovery of an un-notified pathology report (27%), followed by those cases in which it was not accepted that any tumour existed (10%). These, combined with cases where a mis-code was significant (codes F, G and H), comprised 25% of outcomes. While the inclusion of any information on the wrong person's file is potentially of great concern, this was noted in only one case.

Table 16. Outcomes of HMDS-only case research via letters and file review

Code	Comment	Cases	%
A	Cancer codes valid, diagnosed outside Western Australia	10	**1.4**
B	Cancer codes valid, pathological basis, missed report	189	**27.3**
C	Cancer codes valid, imaging diagnosis	34	**4.9**
D	Cancer codes valid, clinical diagnosis	13	**1.9**
E	Cancer codes valid, other non-pathological diagnosis	29	**4.2**
F	Miscoded, same tumour as one already on Cancer Registry	33	**4.8**
G	Miscoded, non-reportable tumour	32	**4.6**
H	A neoplasm exsists, but invasive malignancy code incorrect	34	**4.9**
I	No tumour / neoplasm at all	70	**10.1**
J	No useful information in file or in letter reply	8	**1.2**
K	No file available	57	**8.2**
L	Information was on wrong patient's record	1	**0.1**
Q	Still querying, unresolved	1	**0.1**
R	Reply suggests another unreported cancer for separate follow-up	1	**0.1**
X	No response to letter	159	**23.0**
Y	Some information, requiring follow-up	21	**3.0**
All		692	**(100)**

For the purposes of comparing results across tumour types and other aspects of the process, a simpler set of outcome groupings was developed from these, shown in Table 17.

Table 17. Simplified groupings of HMDS-only cancer case research outcomes

Code	Comment	Cases	%	% of resolved cases
C1	Code correct and adds to WA cancer incidence statistics	265	**38.3**	59.6
C2	Miscoded, but still a cancer that adds to WA incidence statistics	1	**0.1**	0.2
C3	A cancer, but not affecting WA statistics	43	**6.2**	9.7
C4	A tumour, but not a "cancer"	66	**9.5**	14.8
C5	No tumour at all	70	**10.1**	15.7
C6	Not resolved	247	**35.7**	-
All		692	**(100)**	**(100)**

Overall, 36% of cases were unable to be resolved in the time frame allowed for the project, but over 38% of cases were found to represent a valid cancer case which would have contributed to Western Australian cancer incidence statistics if reported with satisfactory evidence.

Of those cases which were resolved, 60% would have contributed to incidence data (categories C1 and C2 in Table 17). Cancers which were correctly coded but which would not affect these data comprised 10%, and included cases found to have been previously diagnosed while resident elsewhere, or long ago (category C3). Significant proportions of resolved cases were found to have been inappropriately coded as "cancers" (15%) (category C4), or to have been incorrect in that there was no evidence found to confirm a neoplasm of any kind (16%; category C5).

Method of enquiry

Requests for files at Perth hospitals resulted in a slightly higher proportion of resolved cases (69%) than did the writing of enquiry letters (62%) (Table 18). However, at the time of writing, reminder letters had only recently been sent, and the proportion of successful letter-based case queries is expected to improve further.

Among the cases researched by file request, the proportion determined to be valid "missed" invasive cancer diagnoses was higher (73%) than among the cases queried by letter (54%). Conversely, no-tumour and non-cancer cases were only half as common as in the letter-based cases.

Table 18. Outcomes for 692 "HMDS-only" cancers, 2004 - by method of investigation

Outcome		Research method: File	Research method: Letter
Unresolved cases		59	188
Resolved cases		134	311
Resolved, %		69.4	62.3
Percentage of resolved cases by outcome category -			
C1	Code correct and adds to WA cancer incidence statistics	73.1	53.7
C2	Miscoded, but still a cancer that adds to WA incidence statistics	0.0	0.3
C3	A cancer, but not affecting WA statistics	9.7	9.6
C4	A tumour, but not a "cancer"	6.0	18.6
C5	No tumour at all	11.2	17.7
		(100)	(100)

Hospital location

There was no marked variation in the proportion of "missed" cancer cases based on hospital location: 60% for Perth metropolitan, 58% for rural. Proportions of cases resolved were also similar despite the predominance of file-review cases in Metropolitan cases, and letter-based queries in rural cases (Table 19).

Table 19. Outcomes for 692 "HMDS-only" cancers, 2004 - by location of originating hospital

Outcome		Hospital location: Metro	Hospital location: Rural
Unresolved cases		197	50
Resolved cases		352	93
Resolved, %		64.1	65.0
Percentage of resolved cases by outcome category -			
C1	Code correct and adds to WA cancer incidence statistics	59.9	58.1
C2	Miscoded, but still a cancer that adds to WA incidence statistics	0.3	0.0
C3	A cancer, but not affecting WA statistics	9.9	8.6
C4	A tumour, but not a "cancer"	13.4	20.4
C5	No tumour at all	16.5	12.9
		(100)	(100)

Hospital type

There was some indication of a slightly better resolution rate for public hospital cases (67%) than for private hospital cases (63%), and a slightly higher proportion of "resolved" cases that were relevant to Western Australian cancer statistics (Table 20).

Table 20. Outcomes for 692 "HMDS-only" cancers, 2004 - by hospital type

		Hospital type	
Outcome		Private	Public
Unresolved cases		154	93
Resolved cases		259	186
Resolved, %		62.7	66.7
Percentage of resolved cases by outcome category -			
C1	Code correct and adds to WA cancer incidence statistics	57.5	62.4
C2	Miscoded, but still a cancer that adds to WA incidence statistics	0.4	0.0
C3	A cancer, but not affecting WA statistics	10.8	8.1
C4	A tumour, but not a "cancer"	15.4	14.0
C5	No tumour at all	15.8	15.6
		(100)	(100)

Research method, hospital type and hospital location

The choice of research method used was based on experience gained within the Cancer Registry over many years, and was clearly not independent of hospital type (Public / private) nor of location (it was not feasible to visit rural hospitals).

All simple statistical comparisons of the likelihood of case resolution, or of a case being coded correctly, showed non-significant outcome differences between hospital types and hospital locations.

Taking both hospital type and hospital location into account, case resolution appeared marginally, but not significantly, less likely for file-based queries (adjusted odds ratio 0.73, 95% confidence interval 0.49 - 1.09).

However, taking hospital type and location into account, an outcome indicating a valid invasive malignancy in a WA resident was less likely for letter- based enquiries than for file-review cases (odds ratio 0.39, 95% c.i. 0.23 - 0.66)

Together, these results suggest that both file review and enquiry letters produce similar chances of obtaining an answer in a particular case; that most “missed” reportable cancers are found by file review in accessible hospitals, both private and public; but that the use of enquiry letters will remain necessary if one wishes to reliably disregard some “HMDS-only” cases.

Cancer type

The individual cancers assessed and their outcomes are shown in Table 21 (see next page), with the most common types shown first. Among the ten most common types, resolution was achieved in between 54% and 82% of cases. The proportion of "resolved" cases that were found to be valid invasive malignancies that would be included in Western Australian cancer incidence statistics ranged from a low 21% for bladder cancer, to 93% for leukaemia.

Many less-common cancers were investigated with 100% resolution based on only one or two cases.

Among the ten cancer types shown to be most often correct and relevant to WA cancer incidence data, with nine or more cases examined, a coded diagnosis of primary liver cancer was most often reliable (Table 22). Leukaemia, thyroid and primary brain cancers were most often found to be correct.

Cancers of the lip were usually resolved (82%) and found or said to be correctly coded (78%) but were also often found to be non-reportable cancers of the skin of the lip (22%). This does cast some doubt on the interpretation of enquiry letters by doctors who may not have referred to a pathology report and who may have been unaware of the distinction (crucial to the Cancer Registry but not to clinical practice) between the lip and the skin of the lip.

Table 22. Outcomes for 692 "HMDS-only" cancers, 2004 - types most often found correct and relevant to WA cancer statistics

Cancer	Cases resolved				Outcomes, resolved cases only (%)				
type	Cases	No	Yes	Resolved, %	C1	C2	C3	C4	C5
Liver & intrahepatic bile ducts	12	6	6	50.0	100.0	0.0	0.0	0.0	0.0
Leukaemia	52	24	28	53.8	92.9	0.0	0.0	3.6	3.6
Thyroid gland	15	6	9	60.0	88.9	0.0	11.1	0.0	0.0
Brain	12	6	6	50.0	83.3	0.0	16.7	0.0	0.0
Lip	22	4	18	81.8	77.8	0.0	0.0	22.2	0.0
Lymphoma	37	12	25	67.6	76.0	0.0	4.0	0.0	20.0
Other lymphohaematopoietic neoplasms	144	58	86	59.7	75.6	0.0	7.0	3.5	14.0
Myeloma & plasma cell tumours	17	9	8	47.1	75.0	0.0	0.0	12.5	12.5
Melanoma (skin)	23	9	14	60.9	71.4	0.0	7.1	21.4	0.0
Eye & lacrimal gland	9	0	9	100.0	66.7	0.0	11.1	22.2	0.0

Table 21. Outcomes for 692 "HMDS-only" cancers, 2004 - by cancer type

Cancer	Cases resolved				Outcomes, resolved cases only (%)				
type	Cases	No	Yes	Resolved, %	C1	C2	C3	C4	C5
Other lymphohaematopoietic neoplasms	144	58	86	59.7	75.6	0.0	7.0	3.5	14.0
Colorectal cancer	58	18	40	69.0	40.0	0.0	12.5	27.5	20.0
Prostate gland	56	24	32	57.1	59.4	0.0	15.6	3.1	21.9
Leukaemia	52	24	28	53.8	92.9	0.0	0.0	3.6	3.6
Urinary bladder	44	16	28	63.6	21.4	0.0	25.0	25.0	28.6
Lymphoma	37	12	25	67.6	76.0	0.0	4.0	0.0	20.0
Lung, bronchus & trachea	33	13	20	60.6	40.0	0.0	10.0	25.0	25.0
Breast	23	8	15	65.2	26.7	6.7	26.7	13.3	26.7
Melanoma (skin)	23	9	14	60.9	71.4	0.0	7.1	21.4	0.0
Lip	22	4	18	81.8	77.8	0.0	0.0	22.2	0.0
Unknown primary site	20	6	14	70.0	28.6	0.0	0.0	42.9	28.6
Kidney & other renal tract	19	7	12	63.2	58.3	0.0	8.3	16.7	16.7
Myeloma & plasma cell tumours	17	9	8	47.1	75.0	0.0	0.0	12.5	12.5
Pancreas	16	4	12	75.0	66.7	0.0	0.0	0.0	33.3
Thyroid gland	15	6	9	60.0	88.9	0.0	11.1	0.0	0.0
Brain	12	6	6	50.0	83.3	0.0	16.7	0.0	0.0
Liver & intrahepatic bile ducts	12	6	6	50.0	100.0	0.0	0.0	0.0	0.0
Ovary, uterine adnexa & other female	10	5	5	50.0	60.0	0.0	0.0	20.0	20.0
Eye & lacrimal gland	9	0	9	100.0	66.7	0.0	11.1	22.2	0.0
Stomach	9	1	8	88.9	0.0	0.0	12.5	25.0	62.5
Gallbladder & bile ducts	6	2	4	66.7	25.0	0.0	0.0	50.0	25.0
Vulva/vagina	6	0	6	100.0	50.0	0.0	33.3	0.0	16.7
Connective, subcutaneous tissue	5	1	4	80.0	25.0	0.0	0.0	50.0	25.0
Nasal cavity, sinuses, mid & inner ear	5	0	5	100.0	40.0	0.0	0.0	60.0	0.0
Tongue	4	1	3	75.0	66.7	0.0	33.3	0.0	0.0
Bones, joints & articular cartilages	3	0	3	100.0	0.0	0.0	0.0	100.0	0.0
Cervix uteri	3	1	2	66.7	100.0	0.0	0.0	0.0	0.0
Major salivary gland	3	1	2	66.7	100.0	0.0	0.0	0.0	0.0
Nasopharynx	3	0	3	100.0	33.3	0.0	0.0	66.7	0.0
Oesophagus	3	0	3	100.0	66.7	0.0	33.3	0.0	0.0
Penis & other male genital organs	3	1	2	66.7	50.0	0.0	50.0	0.0	0.0
Testis	3	1	2	66.7	50.0	0.0	0.0	50.0	0.0
Corpus uteri	2	0	2	100.0	50.0	0.0	0.0	50.0	0.0
Mesothelioma	2	0	2	100.0	50.0	0.0	50.0	0.0	0.0
Nervous system, peripheral & autonomic	2	0	2	100.0	50.0	0.0	0.0	50.0	0.0
Uterus, nos	2	2	0	0.0	-	-	-	-	-
Kaposi sarcoma	1	0	1	100.0	100.0	0.0	0.0	0.0	0.0
Larynx	1	0	1	100.0	0.0	0.0	100.0	0.0	0.0
Mouth, other & unspecified	1	0	1	100.0	100.0	0.0	0.0	0.0	0.0
Pleura, heart & mediastinum	1	0	1	100.0	100.0	0.0	0.0	0.0	0.0
Pyriform sinus & hypopharynx	1	0	1	100.0	100.0	0.0	0.0	0.0	0.0
Thymus	1	1	0	0.0	-	-	-	-	-
Grand Total	**692**	**247**	**445**	**64.3**	**59.6**	**0.2**	**9.7**	**14.8**	**15.7**

Among the most common cancers (9 or more cases examined), the worst outcome, in terms of coding and relevance, was for stomach cancer (Table 23), with none of 9 cases confirmed as both valid and relevant; 5 of 9 showed no evidence for any neoplasm at all. This was followed by bladder and breast cancer and cancers of unknown primary site. Bladder and breast cancers were often coded incorrectly, and for bladder more so than for breast cancer, coded as invasive when an *in situ* code would have been more appropriate.

Table 23. Outcomes for 692 "HMDS-only" cancers, 2004 - types least often found correct and relevant to WA cancer statistics

Cancer	Cases resolved				Outcomes, resolved cases only (%)				
type	Cases	No	Yes	Resolved, %	C1	C2	C3	C4	C5
Stomach	9	1	8	88.9	0.0	0.0	12.5	25.0	62.5
Urinary bladder	44	16	28	63.6	21.4	0.0	25.0	25.0	28.6
Breast	23	8	15	65.2	26.7	6.7	26.7	13.3	26.7
Unknown primary site	20	6	14	70.0	28.6	0.0	0.0	42.9	28.6
Colorectal cancer	58	18	40	69.0	40.0	0.0	12.5	27.5	20.0
Lung, bronchus & trachea	33	13	20	60.6	40.0	0.0	10.0	25.0	25.0
Kidney & other renal tract	19	7	12	63.2	58.3	0.0	8.3	16.7	16.7
Prostate gland	56	24	32	57.1	59.4	0.0	15.6	3.1	21.9
Ovary, uterine adnexa & other female	10	5	5	50.0	60.0	0.0	0.0	20.0	20.0

5.3.3 Conclusion and recommendations

Choice of research method used was influenced by both hospital type (experience with availability of notes) and hospital location (it was not feasible to visit rural hospitals). Within the limitations imposed by these constraints, these results show no compelling reason to restrict enquiries to a type of hospital, or to the Perth metropolitan area of Western Australia, as valuable information was obtained from all areas and using all methods.

However, file-review seems more likely to result in a finding suggesting an HMDS-only cancer record is valid. Reasons for this may include a relatively-short amount of time a clinician can devote to file examination when they receive an enquiry letter, whereas a Cancer Registry staff member could in principle spend as long as is necessary to read the complete file. Balanced against this is the practical reality of the situation - 10 minutes average per file for a file review, plus a share of trip-related cost and time for each file seen; versus less time per case for generating form letters from information already on hand, but imposing on the clinician's time instead.

Recommendations arising from these results include:

1. The 692 case reviews performed in this study have confirmed that the HMDS-only records cannot be used, without individual review, without the risk of introducing serious errors into Western Australian cancer incidence statistics.

2. Efforts to follow-up HMDS-only cancer cases should include both metropolitan and rural, as well as both public and private hospitals.

3. File review may yield better results for finding of valid and relevant cancer cases, saves clinicians time, and should continue to be used when practicable.

4. Enquiry letters should continue to be used as there is a relatively small investment in Registry cost and time, and these have been shown to result in the detection of many wrongly-coded "cases".

5. The results suggest that HMDS-only records for urinary bladder cancer are less likely than others, to be confirmed as invasive malignancies ("cancers") in Western Australian residents.

6. References

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LIST OF APPENDICES

- Notes -

Appendix 3A now contains an incidence data summary for the most common cancers on page A3-10.

Appendix 1. About The Western Australian Cancer Registry

Appendix 1A. Overview and technical issues

History and role

The Western Australian Cancer Registry is a population-based cancer registry established in 1981. The mandatory reporting of cancers diagnosed by pathologists, haematologists and radiation oncologists is underpinned by the Health (Notification of Cancer) Regulations; the most recent version can be found in **Appendix 2E**. The Registry was established in recognition of the potential importance of reliable population-based cancer data in the planning of services and in the prevention and treatment of cancer.

Surveillance of cancer extends beyond State and national boundaries and this Registry cooperates with other State registries and the National Cancer Statistics Clearing House (NCSCH) (a central cancer data collection for the whole of Australia based at the Australian Institute of Health and Welfare in Canberra). Data are also provided to the Australian Mesothelioma Register in Canberra, and the International Agency for Research on Cancer in Lyon, France, for inclusion in Australian statistics published nationally and world-wide.

The Registry is a member of the Australasian Association of Cancer Registries (AACR) which includes all Territory and State cancer registries, and the International Association of Cancer Registries (IACR). The AACR meets annually to discuss matters such as common coding systems, comparability of data between areas in Australia and involvement in Australia-wide cancer research projects.

Registry scope

The Western Australian Cancer Registry reports on cancers and other neoplasms diagnosed in persons while resident in Western Australia. A separate register is maintained for recording detailed asbestos exposure and other history for all cases of malignant mesothelioma. In practice, the Registry records available information about cancers diagnosed elsewhere, in Western Australians, as this is often vital to the interpretation of new reports, or mortality information.

As in other Australian cancer registries, information concerning tumours diagnosed in Western Australia in persons ordinarily resident elsewhere in Australia, is forwarded to the relevant State or Territory cancer registry, and is not included in Western Australian incidence statistics.

Cancer deaths in current or former Western Australian residents are recorded when possible, regardless of place of death or address at diagnosis, to facilitate survival analysis. However, in routine tables of mortality, geographic location is based on place of residence at time of death rather than on the place of death. Accordingly, the Registry's mortality statistics routinely include only deaths, in Western Australia, of persons resident in Western Australia at the time. In contrast to incidence, mortality reports include deaths due to all non-melanoma skin cancers.

Legislative basis

The Registry acts with the delegated authority of the Executive Director of Public Health with respect to the Health (Notification of Cancer) Regulations 1981. These, as amended in February 1996, require the notification of *in situ* neoplasms and all non-melanoma skin cancers other than basal cell and squamous cell carcinomas, as well as all invasive malignancies and benign CNS tumours (see **Appendix 2E**).

Sources of data

Most notifications are received from pathology laboratories, which supply pathology reports on paper or computer data files. The electronic notification system relies on the tumour codes or "notify Registry" flags generated by pathologists to select the reports which reach the Registry, and it is believed that this has enhanced the completeness of reporting from the larger hospital laboratories. Radiation oncologists also notify patients treated for cancer.

In-house linkage routines are used to link pathology and mortality data files to the Registry to permit creation of new records, or the updating of date, place and cause of death information. Additional cancer registrations are obtained from the remaining (unmatched) mortality records after electronically scanning the written cause of death and other fields on a data file. Data are now obtained from the W.A. Registrar-General's Office via the Data Linkage Unit in the Health Information Centre. Records are created on the Cancer Registry for persons with these previously-unrecorded tumours, and efforts are then made to obtain independent verification of tumour details. Those for which no supporting information can be obtained after research are treated in subsequent reports as "death certificate only" (DCO) tumours.

Additional demographic information including country of birth, Aboriginality or indigenous status, and occupation can often be obtained, either from periodic extracts of the W.A. Hospital Morbidity Data System (HMDS) files (maintained in the Health Information Centre), or via on-line access to a Patient Master Index maintained in Perth Metropolitan Area government hospitals. In 2000, the HMDS was assessed as a potential passive source of cancer notifications for tumours not otherwise reported to the Registry, and a process of assessing the impact of such additional records on Western Australian incidence statistics is presented in this report; such data underpin a current initiative aimed at obtaining changes in the Health (Notification of Cancer) Regulations.

Data handling and maintenance

The Registry still maintains paper records for individual cases, although as pathology reports are increasingly being received in electronic form, on-screen-only coding is still being considered. A long-awaited computer software re-enginerering process is currently being considered in the light of evaluation of competing replacement systems.

New registrations and updates are made on a locally-designed computerized multi-user database installed on an IBM-compatible microcomputer network. In general, cancer cases are recorded with one demographic record for each person with a separate, linked, record for each tumour. Records which are incomplete or which are found to be inaccurate in the light of new information are progressively updated, and the data are thus subject to continual enhancement until the time of any final update such as that following confirmation of death information. Registry records that are duplicates of existing cases are now handled by cross-referencing to the "valid" case, rather than deletion, minimizing the repetition of "detective" work if more information later comes to hand.

Statistics are produced from database extracts using the Registry's own incidence and mortality rates calculation system and a variety of other statistical and graphics software packages. Software for routine statistical reports is constantly being developed and upgraded to reflect changes in coding systems, geographical area divisions and the types of data requests received. The vast majority of tables in this report are created directly from this in-house software.

Where resources permit, customized tabulations using similar area and age group subdivisions are made available to researchers and students on request.

Coding practices

General

The coding of tumour data is based on the International Classification of Diseases for Oncology (ICD-O) which originated as an extension of Chapter II (Neoplasms) of the Ninth Revision of the International Classification of Diseases (ICD-9); now related to ICD-10.

ICD-O permits separate coding of topography ("site"), morphology ("tissue") and behaviour, and thus allows a more comprehensive characterization of some tumours than the single-code ICD-9 and ICD-10 classification system. Topography and morphology codes in this report are from ICD-O third edition (2000) (ICDO-3),[a] following the successful conversion of software, and translation of historical data in 2003.

In general, for incidence reporting, leukaemias, lymphomas and other lymphohaematopoietic malignancies are grouped on the basis of morphology codes, as for cutaneous melanoma, Kaposi sarcoma and mesothelioma, while others are tabulated on the basis of topography, or location. This Registry does use Behaviour code "6" to indicate tumours of unknown primary site.

For the sake of consistency in reporting of incidence and mortality data, causes of death are coded to morphology (lymphohaematopoietic malignancies, Kaposi sarcoma and mesothelioma) and topography (others). Melanoma deaths are coded to the ICD-10 code, C43*x*, to distinguish them from deaths due to non-melanoma skin cancers (C44*x*). In accordance with IACR guidelines adopted by AACR, deaths due to melanomas of unknown primary site are now included with deaths due to (known) primary skin melanoma.

Non-Western Australian diagnoses are excluded from incidence reporting routines but are recorded for reference. A system of 'aliasing' duplicate or otherwise invalid records allows ongoing reconciliation of old data files with current database information, as necessary for follow-up studies.

Cancer Registry mortality reporting has been based on death certificate coding performed within the Registry since 1990. Reconciliation with coding by the Australian Bureau of Statistics is now an established monthly process. This exchange is important, as annual ABS-coded mortality files are normally not released until well into the year following death, which is, in some cases, a delay of almost 2 years.

Multiple tumours

Two or more discrete tumours of different (3-character) sites in any individual are counted separately for the purposes of incidence statistics. However, in accordance with international practice, tumours arising in sites coded with the same first three characters are counted as one. This, in effect, means that a person who has two similar tumours diagnosed, even many years apart, is reported only once in incidence statistics. This applies even when tumours arise in paired organs, e.g. lung or breast and are regarded as truly separate, unless the histology of the tumours concerned is different enough to permit the counting of both.

Groups of histological types considered to be different, for the purposes of allowing the counting of more than one tumour of the same three-character "site", are based on those in Jensen *et al* (1991).[b] Currently the Registry uses the ICDO-2-based table as promulgated by the International Association of Cancer registries. Using these rules, for example, a squamous cell carcinoma of the lung and an adenocarcinoma of the lung arising at any time will both be

[a] World Health Organization (2000) *ICD-O: International classification of diseases for oncology* (Third Edition). WHO, Geneva.

[b] Jensen OM, Parkin DM, MacLennan R *et al* (1991) *Cancer Registration: Principles and methods*. IARC Scientific Publications No. 95, Lyon, France.

counted in incidence statistics. Lymphohaematopoietic malignancies are treated differently, being tabulated by morphology, and their discovery in a particular site does not preclude the counting of different types of neoplasms in the same sites. The renal tract is treated as a special case of an "extended site", whereby multiple transitional cell carcinomas of sites C65*x* to C68*x* , except bladder (C67*x*), are counted only once in a person.

While these practices govern the reporting of cancers for incidence statistics in accordance with international practice, it is an inescapable conclusion that multiple tumours have separate effects on health, and the best illustration of this is in relation to survival. Cases occur in which a person has a breast carcinoma, and is treated and considered cured, only to die from a second primary breast carcinoma arising many years later. Measuring survival time from the first tumour diagnosis (the "incident" tumour) and ignoring the presence of the second, can lead to a simplistic analysis which falsely underestimates cure rates. To allow better analysis, the Registry now separately records all tumours, and statistics counting tumours, rather than cases, can be provided if required.

This Report will be the last in which the "multiple-primary" rules based on the ICDO-2 classification will be used, as the Registry currently uses ICDO-3 and the newer ICDO-3-based rules appear more sensible in terms of the urinary-system tumours in particular. Accordingly, tumour groupings in future Reports will differ slightly from those used in this publication (see Appendix 2F).

"Death certificate only" cancers

Death certificate only (DCO) cancers are those for which no information other than a death certificate is available. From mortality data, records of previously-unknown tumours are created on the Cancer Registry, and efforts are made to obtain independent verification of details. Those for which no supporting information can be obtained after research are treated in subsequent reports as "death certificate only" (DCO) tumours. Up to 60 tumours are followed up in this way each month, and supporting information is eventually obtained for the vast majority. Very few tumour records remain in this category. Tumours of unknown primary site have been consistently more common among DCO cases than among cancers in general.

To achieve such a low proportion of DCO cases, reporting of statistics must be delayed, until most follow-up is complete. Rapid access to death notifications assists the Registry to commence enquiries while information is still accessible. Due to workload issues, DCO cases are now been treated as "resolved" if a compatible hospital discharge record is found, and a special Basis of Diagnosis code of "H" is used.

Lymphomas

ICD-O codes are used for coding lymphomas, however several "in-house" morphology codes are used when the best ICD-O code is too general; these are shown in the footnote to the table in Appendix 2F(b). These codes are converted, when contributing data to others, to the relevant less-specific ICD-O code.

Basis of Diagnosis

Most notifications result from diagnoses made on the basis of tissue examination (histology, cytology, haematology), and these are generally regarded as the most reliable. Their percentage of the total cases is shown in the "TissDx" column of some tables in this report.

[a] Breslow A (1970) Thickness, cross-sectional area and depth of invasion in the prognosis of cutaneous melanoma. Ann Surg **172,** 902-908

[b] Clark WH *et al* (1975) The developmental biology of primary cutaneous malignant melanoma. Seminars in Oncology **2**, 83.

Additional data for specific tumour types

A number of additional data items are collected for some tumours. For primary invasive breast cancer, the Registry records maximum tumour diameter, number of axillary lymph nodes biopsied and the number affected by cancer, whether a tumour is multi-centric, and whether there is associated ductal carcinoma in situ (DCIS) outside the margins of the invasive tumour. For primary skin melanoma, the maximum thickness of the tumour and Clark's level are recorded (Breslow 1970[a] Clark *et al* 1975[b]), and are used in many of this Registry's reports.

Quality assurance

Data quality is assessed in various ways, both continuous and occasional. On a continuous basis, all coding on pathology reports, and the details entered on the database, are checked by a second member of the Registry staff, and queries are referred to a Registry medical officer. In addition, the Registry database system incorporates various "unusual case" warnings, based on dates, sex, and age. A case-flagging system, based on site and tissue combinations and the rules encapsulated in a modified version of IARC's "Check" routine,[5] warns of unusual records. A verification code is assigned to records which do not fit the "rules" but which are believed to be correctly coded.

Available external indicators of Registry completeness are all potentially biased in favour of cancers which are more often serious, causing hospitalization or death. Reports from radiation oncologists serve as a useful avenue for checking receipt of reports based on previous pathology specimens, and enables recording of a small number of cancers which were not diagnosed histologically. The Hospital Morbidity System, which records details of all hospitalizations in Western Australia, is another potential source of information regarding Registry completeness.

If trends in incidence, mortality and migration are constant, then the ratio of the number of new cancer diagnoses registered to the number of cancer deaths (mortality to incidence ratio) serves as a crude indicator of completeness.

Uses of Cancer Registry data

Non-identifying data are available for release to interested parties, subject to time constraints, as data files or as finished tables and figures. Only data which do not identify any patient, care provider or institution can be treated in this manner. Release of named information is strictly controlled (see "Confidentiality guidelines") and data can only be released to persons other than the original providers (or other clinicians involved in ongoing care of the individual) with personal consent, or a formal approval from the Confidentiality of Health Information Committee (CHIC) which is responsible to the Minister for Health.

Data are used in a wide variety of research projects, including the recruitment of subjects for descriptive and case-control studies. Specific requests have included data on incidence in specific areas, cancer deaths by location and institution type, melanoma levels and depths, mesothelioma deaths and occupation, teenage cancers, myeloma survival and ocular melanoma. Registry data have been used in a number of studies of cancer incidence, and in a number of national projects, most notably those commissioned by the National Breast Cancer Centre.

In addition to technical and statistical enquiries, the Registry receives general and personal enquiries regarding cancer services and medical problems; these are referred when appropriate to other agencies and treating physicians.

The Registry provides support for four hospital-based cancer registries (HBCRs). In the hospital setting, with clinical and pathological staging and treatment data, the availability of mortality data facilitates the assessment of outcomes using survival analysis.

Appendix 1B. Current issues

Registry staffing and workload

In 2003, a long process seeking reclassification of "Clerical officers" to a higher level, redesignated "Data quality officers", came to a successful conclusion. The resources now available to service the needs of a population of 1.9 million people now include -

Principal Medical Officer/Manager	1.0 fte
Medical Officer/coding adviser	0.2 fte
Data Quality Officers	3.5 fte
Mesothelioma research officer	0.25 fte
Analyst/programmer	1.0 fte

Additional resources used include financial/ Human Resources services, the cooperation of the Epidemiology Branch on some statistical issues, and production/graphic design services from the Health Promotion Branch. However all reports such as this are produced primarily within the Registry itself.

Workload is not adequately represented by reported “cancer” totals. In 2004, there were 9244 invasive cancer cases as mentioned earlier in this report. However, in the same year there were 16512 pathology records added to the registry databases, and 19126 records were edited in some way by staff.

The increases in these workload estimates exceed population growth rates, and underscore the need to properly resource such disease registries to ensure a continued capacity to deal with the demands of health service planners, researchers, students and the public.

Assessment of current notification system and Regulations

Western Australia is the only Australian State in which there is no legal requirement for the direct notification of cancer diagnoses by hospitals; there is consequently some incompleteness in WA statistics for some cancer types. As a result of two successful "Graduate Officer" placement requests made under a new Department of Health program in 2004, a review and update of a previous assessment of the opportunities for more complete notification based on hospital data for non pathologically-diagnosed cancers, has recently been completed, and the findings are being made available in support of a process of seeking changes to the Health (Notification of Cancer) Regulations 1981 so as to require hospital notification, among other things. The need, process and outcomes are described in Sections 4 and 5 of the current report.

Current data systems cannot be used satisfactorily for this purpose as there are 3 key data items - basis of diagnosis, date of diagnosis and place of residence at diagnosis - that are not included. The Registry has participated in consultations concerning a replacement of the (public) hospital Patient Administration System, and these data items are to be considered when choosing potential replacement systems.

Appendix 2. Technical and miscellaneous information

Appendix 2A. Glossary

General

ABS	Australian Bureau of Statistics
Age-adjusted rate - rate resulting from age-standardization using only a subset of the entire age range for cases and population, e.g. 0 - 15 years.	
ASR	Age-standardized rate per 100,000 persons ("World standard" population) (Segi 1960)[a]
ASPR	Age-specific rate per 100,000 persons in a specified age range
BCC	Basal cell carcinoma
CHIC	Confidentiality of Health Information Committee
DCO	Death certificate only
LHN	Lymphohaematopoietic Neoplasms
NMSC	Non-melanoma skin cancer
SCC	Squamous cell carcinoma
SD	Standard deviation
ICD-O	International Classification of Diseases for Oncology
LR	Lifetime risk (to a particular age, usually 75 years)
NOS	Not otherwise specified
PYLL	Person-years of life lost (before a particular age, usually 75 years)

Additional terms used in column headings of incidence and mortality tables:

95%c.i.	Statistical 95% confidence interval
Crude	Crude rate per 100,000 persons
Cum inc	Cumulative incidence (%)(before a particular age, usually 75 years)
SD	Standard deviation
Risk	Lifetime risk (usually to age 75; 1 in *n*). In some tables, "-" indicates no data, "*" indicates a risk of less than 1 in 1,000.
TD%	Percentage of diagnoses made on basis of tissue examination (histology, haematology or cytology).

[a] Segi M (1960) *Cancer mortality for selected sites in 24 countries (1950-1957)*. Sendai, Japan, Tohoku University Press.

Appendix 2B. Statistical methods and formulae

Age groups

The basis for most statistics is a summation of cases by five-year age groups. Age groups are expressed in whole years, ie "10-14" means 10.0 to 14.99.... years.

Rates

Rates in this report are calculated separately for males and females and are expressed as cases per 100,000 person-years. (If one year's data are being analyzed, this is equivalent to *n* cases per 100,000 population for that year.)

Age-specific rates are based on five-year age intervals and are calculated by dividing the numbers of cases by the population of the same sex and age group, over the relevant period.

Crude rates are calculated simply as the total cases divided by the total population over a wide age range; they are not suitable as a basis for comparison of rates in different areas if the age-structures of the populations differ.

Age-standardized rates (ASR in Tables) are calculated by the direct method [a] and represent a summation of weighted age-specific rates (weighting being determined by the relative proportion of the population in each age group compared with the proportion in the World Standard Population [b]). Weightings by other population standards can be used if requested.

The **standard deviation**, or Estimated Standard Error (ESE) is used as a measure of variability for rates in tables; an approximate 95% confidence interval for a rate is (rate $\pm$ 1.96 ESE).

Formulae:

$$\text{ASR} = 10^5 \times \Sigma_i \, r_i \times w_i \, ; \qquad \text{ESE} = 10^5 / W \times [\, \Sigma_i \, \{ \, r_i \times (\, 1 - r_i \,) \times w_i^2 / n_i \, \}]^{1/2} \, ,$$

where w_i is the World Standard Population [b] for the ith age group, $W = \Sigma_i \, w_i$ and Σ_i denotes summation over all (relevant) age groups.

Subsets of the full age range: where a subset of age groups is considered, the term **age-adjusted rate** is used instead of ASR, to indicate that standardization has taken only the age groups of interest into account for both cases and population.

Comparison of rates between different areas may be done using indirect standardization. In this process, for example, the State population and age-specific rates are used to calculate an expected number of cases in different areas, based on their populations; the observed and expected numbers are compared using the Standardized Incidence (or Mortality) Ratio and a 95% confidence interval.

Relative survival has been calculated using Relsurv 2.5 (Hedelin[c]) which produces 5-year survival for even most recent cases by mathematical modelling. Detailed methods may be found in Threlfall TJ, Brameld K (2000) *Cancer survival in Western Australian residents, 1982-1997* (*see* WACR Publications) - which used an earlier version of the software.

[a] Rothman KJ (1986) *Modern epidemiology*. Little, Brown & Company, Boston.
[b] Segi M (1960) *Cancer mortality for selected sites in 24 countries (1950-1957)*. Sendai, Japan, Tohoku University Press.
[c] Hedelin G (2001) Relsurv A program for relative survival. Laboratory for Epidemiology and Public Health, Faculty of Medicine, 6700 Strasbourg Cedex, France.

Cumulative Incidence and Lifetime Risk

The **cumulative incidence** of a condition (at a given age) is a measure of the proportion of all persons who have, by that age, been affected by the condition; the Registry calculates this for cancer incidence, and death due to cancer. Cumulative rates are calculated by summing the age-specific rates for specified five year age groups, and are expressed as percentages unless otherwise noted.

In general, a **risk** is derived from the cumulative rate and is interpreted as a "1 in *n*" chance of developing the disease, while cumulative rates are commonly presented as percentages affected. In Registry reports, risk is usually presented as lifetime risk derived from the cumulative risk for age groups 0-4 to 70-74. However, in tables restricted to age subgroups, risk is derived from the cumulative rate calculated for the age groups listed - e.g. 15-39 years, 40-64 years and 65 years and older.

The method for Risk calculations assumes that the risks at the time of estimation remain the same throughout life, and does not account for the effects of death from other causes or interventions which may reduce the chances of a cancer diagnosis.

Formulae:

The formulae for *CI* and *Risk* are:

$$CI = \Sigma_i r_i \times 5 \; ; \qquad Risk = 1 / (1 - e^{-CI}) .$$

Person years of life lost

Person-years of life lost (PYLL) is an estimate of the number of years of life lost due to specific causes of death, and is calculated up to age 75 years, as an index of premature death. The calculations rely on the use of all-causes mortality data for the whole of Western Australia using the methods of Hakulinen and Teppo as presented in Holman *et al.* [a.]

In this report the PYLL is calculated for age 0 to 74 years as a measure of premature death.

Formulae:

For each cause of death, the PYLL lost for the *i*th five-year age group is given by:

$$S_i = 5 \times \{ \Sigma_{j=0,\ldots,i-1} \{ d_j \times p_j^{1/2} \times P_{j+1,i} \times [a_i \times (1 - p_i) + p_i] + d_i \times (1 - a_i) \times (1 + p_i^{1/2}) / 2 \}$$

where a_i is the proportion of the *i*th five-year interval that a person dying during that interval lives, on average. The values used are 0.09, 0.46, 0.54, 0.57, 0.49, 0.50, 0.52, 0.54, 0.54, 0.54, 0.53, 0.52, 0.52, 0.52, 0.51, 0.51, 0.48, 0.45 for age groups 0-4, 5-9, ... ,85+, d_i is the number of deaths from the cause of death of interest in the *i*th age group, p_i is the probability of surviving the *i*th age interval after eliminating the cause of death of interest, and

$$P_{j+1,i} = \Pi_{k=j+1,\ldots,i-1} p_k \quad \text{for } j + 1 < i \, , \quad \text{or } 1 \quad \text{for } j + 1 = i \, .$$

The quantity p_i is calculated as -

$$p_i = \{ (1 - 5 \times a_i \times r_i) / (1 + 5 \times (1 - a_i) \times r_i) \}^{(D_i - d_i)/D_i}$$

where r_i is the death rate and D_i is the total number of deaths for the *i*th age group.

[a] Holman CDJ, Hatton WM, Armstrong BK, English DR (1987) *Cancer mortality trends in Australia, volume II, 1910 - 1984.* Health Department of Western Australia, Perth, Occasional Paper number 18.

Appendix 2C. Populations and geographic areas

The following W.A. population data were used for calculation of 2004 rates in this report

Age	Males	(%)	Females	(%)	All	(%)
0- 4	63700	6.4	61089	6.2	124789	6.3
5- 9	68610	6.9	64964	6.6	133574	6.7
10-14	72361	7.3	68912	7.0	141273	7.1
15-19	74093	7.5	70573	7.1	144666	7.3
20-24	72358	7.3	68822	7.0	141180	7.1
25-29	67579	6.8	65634	6.6	133213	6.7
30-34	74505	7.5	73335	7.4	147840	7.5
35-39	73115	7.4	73293	7.4	146408	7.4
40-44	77625	7.8	77574	7.8	155199	7.8
45-49	72711	7.3	73430	7.4	146141	7.4
50-54	67280	6.8	66815	6.8	134095	6.8
55-59	60332	6.1	57130	5.8	117462	5.9
60-64	44008	4.4	42299	4.3	86307	4.4
65-69	34739	3.5	35033	3.5	69772	3.5
70-74	27023	2.7	29082	2.9	56105	2.8
75-79	21265	2.1	25354	2.6	46619	2.4
80-84	13148	1.3	19206	1.9	32354	1.6
85 +	8000	0.8	17207	1.7	25207	1.3
TOTAL	992452	(100)	989752	(100)	1982204	(100)

(Data from Australian Bureau of Statistics as collated by Information Collection & Management, Department of Health, and used for calculation of rates in this Report.)

The Department of Health's area of responsibility is administered through 2Area Health Services (AHS) (metropolitan) and the Country Health Service, comprising 7 Regions. Overall, the area is divided into 34 Health Districts (HD). Each Health District (HD) lies entirely within an Area Health Service (AHS) or a Health Region (HR) (for Country Area Health Service). Areas have been re-named, and there have been boundary changes. These changes have been incorporated in data files and in the population files used for calculation of incidence and mortality rates in this report.

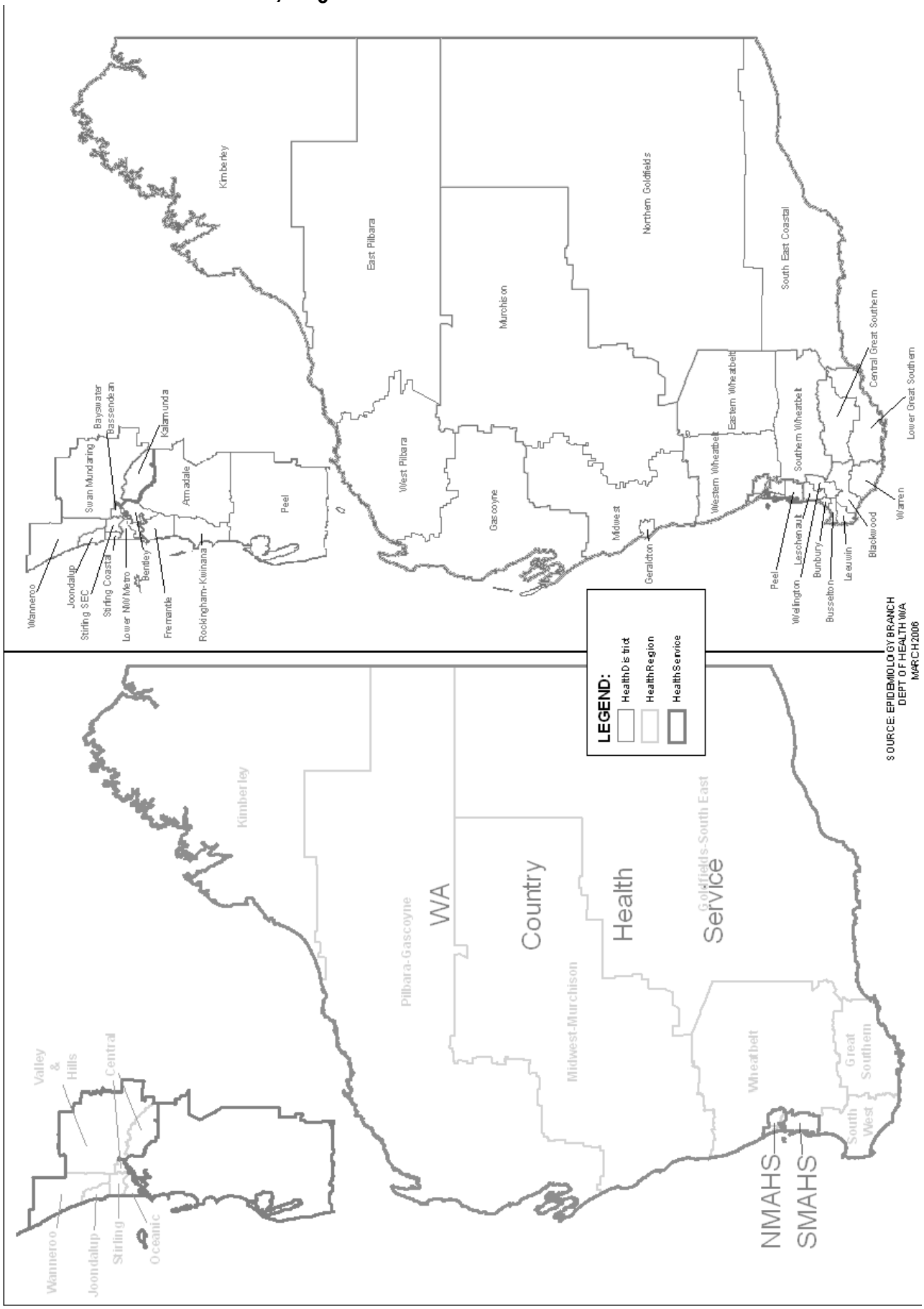
The table and maps below should assist comparison of boundaries and area names with those used in previous reports.

Health District composition of Area Health Services and Regions as used for this Report

CHS Kimberley HR	**CHS Goldfields SE Coastal HR**	**North Metro AHS**
Kimberley HD	Northern Goldfields HD	NMAHS Central HD
CHS Pilbara Gascoyne HR	South East Coastal HD	NMAHS Stirling HD
East Pilbara HD		NMAHS Oceanic HD
Gascoyne HD	**CHS Great Southern HR**	NMAHS Valley and Hills HD
West Pilbara HD	Central Great Southern HD	NMAHS Joondalup HD
CHS Midwest Murchison HR	Lower Great Southern HD	NMAHS Wanneroo HD
Geraldton HD		
Midwest HD	**CHS South West HR**	
Murchison HD	Blackwood HD	
CHS Wheatbelt HR	Bunbury HD	**South Metro AHS**
Eastern Wheatbelt HD	Busselton HD	SMAHS Armadale HD
Southern Wheatbelt HD	Leeuwin HD	SMAHS Bentley HD
Western Wheatbelt HD	Leschenault HD	SMAHS Fremantle HD
	Warren HD	SMAHS Peel HD
	Wellington HD	SMAHS Rockingham-Kwinana HD

* CHS - Country Health Service; AHS - Area Health Service

W.A. Area Health Service, Region and Health District boundaries



Appendix 2D. Confidentiality guidelines

1. Responsibility for the confidentiality of data held by the Cancer Registry will ultimately lie with the Director General of Health (hereafter referred to as the Director General).

2. All Cancer Registry staff will be instructed regarding the need for confidentiality. In addition, Cancer Registry staff will be required to sign a confidentiality declaration. The Senior Medical Officer of the Cancer Registry will be responsible to the Commissioner for ensuring that procedures for ensuring confidentiality are maintained.

3. Release of data may occur at a number of levels:
   (a) Summarized statistical information containing no means of identifying any individual patient, doctor, laboratory or hospital will be available for the purposes of general information and education.

   (b) More detailed statistical information, which may include data files for analysis, but containing no means of identifying any individual patient, doctor, laboratory or hospital, may be released by the Senior Medical Officer.

   (c) Identified information will normally be made available to relevant Australian State or Territory Cancer Registries and to the National Cancer Statistics Clearing House at the Australian Institute of Health and Welfare, for the purposes of improving data quality and consistency. Data are released to the N.C.S.C.H. subject to a provision that any use of such identified data for other purposes is to be referred to this Registry for approval.

   (d) Special information pertaining to identified patients of a particular hospital or doctor may be released by the Senior Medical Officer to the Medical Superintendent of the hospital, or to the doctor, in response to a written request; such requests may be referred to the Department of Health (Western Australia)'s Confidentiality of Health Information Committee if there is concern regarding the identification of individual service providers.

   (e) Applications for further information required for specific areas of research will be referred to the Confidentiality of Health Information Committee which, subject to formal application, may approve the release of identified information to researchers. Such approval will normally include directions regarding steps which may be taken by the researcher in approaching other persons or bodies for further information with respect to persons so identified.

   (f) Approval for the release of identified information for the purposes of research (i.e. in the case of (e) above) will be subject to the current Code of Practice of the Confidentiality of Health Information Committee. This Code includes requirements for written protocols, signed confidentiality declarations, contact with treating doctors prior to any contact with named individuals, and consent.
   The approach of the Committee is summarized by the Code's general statement -

   "Names are only released by the Confidentiality of Health Information Committee on behalf of the Commissioner of Health for medical and public health research which is intended to provide important benefit for the health care of the community and which adheres to stringent guidelines for preserving confidentiality and privacy."

Appendix 2E. Cancer notification regulations

HEALTH (NOTIFICATION OF CANCER) REGULATIONS 1981*
(as modified by the Health (Notification of Cancer) Amendment Regulations 1996)**
MADE by His Excellency the Governor in Executive Council.

1. These regulations may be cited as the Health (Notification of Cancer) Regulations 1981. — Citation.

2. These regulations shall come into operation on 1 August 1981 — Commencement.

3. In these regulations, unless the contrary intention appears, the term "cancer" means any malignant growth of human tissue which if unchecked is likely to spread to adjacent tissue and beyond its site of origin and includes - — Interpretation.
(a) all *in situ* neoplasms;
(b) all malignant neoplasms of the skin other than primary basal cell carcinoma and primary squamous cell carcinoma;
(c) all neoplasms of the brain, spinal cord and cranial nerves, and any other intracranial neoplasms, whether benign or malignant.

4. Cancer is prescribed as a condition of health to which Part IXA of the Health Act 1911 applies. — Cancer prescribed as a condition of health.

5. (1) A medical practitioner who undertakes pathological or biochemical examinations of specimens of human origin, including blood, shall, within 30 days of becoming aware that any specimen indicates that the person from whom it is taken suffers from cancer, forward to the Executive Director of Public Health a copy of any report that he may make upon the examination. — Notification by pathologist.

(2) A report made under subregulation (1) of this regulation in respect of any person shall include -
(a) the full name and address of the person;
(aa) the sex and date of birth of the person;
(b) the name of the medical practitioner by whom the person is referred for examination; and
(c) if the person is a patient in a hospital, the name and address of the hospital.

6. A person who is in charge of any place in which cancer is treated by ionising radiation or accelerated atomic particles shall, within 30 days of the first occasion on which any person is so treated, furnish the Executive Director of Public Health with the following information in relation to that person, namely - — Notification by radiation oncologist.
(a) full name and address of the person;
(b) sex and date of birth of the person; and
(c) the type of cancer for which that person is being treated.
(d) the name of the medical practitioner by whom the person is referred for examination; and
(e) if the person is a patient in a hospital, the name and address of the hospital.

7. A fee of $4 for each person in respect of whom notification is made under regulation 5 or 6 is payable to the person who makes the notification to the Executive Director of Public Health. — Fee for notification.

8. (1) Where the Executive Director of Public Health is notified of the name of a person who suffers from cancer or who is treated for cancer the Executive Director of Public Health may request any medical practitioner or person in charge of a hospital to provide him with any information of the kind set out in the Schedule to these regulations that is known to the medical practitioner in relation to that person. — Executive Director of Public Health may require further particulars.

(2) A person to whom a request is made pursuant to subregulation (1) of this regulation shall comply with that request within 30 days of the receipt of the request.

9. (1) A person who contravenes a provision of the regulations specified in the Table to this subregulation commits an offence.

Table
Regulations 5, 6 and 8(2).

(2) A person who commits an offence under subregulation (1) is liable to a penalty which is not more than $1,000 and not less than -
(a) in the case of a first offence, $100;
(b) in the case of a second offence, $200; and
(c) in the case of a third or subsequent offence, $500.

(* *Published in the Gazette of 24 July 1981 at pp. 3056-6. For amendments to 15 January 1996 see 1994 Index to Legislation of Western Australia, Table 4, pp. 130-131.)*

** Presented in good faith as an accurate representation of the content of Regulations and Schedule as amended February 1996.

HEALTH (NOTIFICATION OF CANCER) REGULATIONS 1981*
(as modified by the Health (Notification of Cancer) Amendment Regulations 1996)**

(continued)

Schedule.
NOTIFICATION OF CANCER.

NAME OF PATIENT:
ADDRESS:
SEX:
DATE OF BIRTH:
OCCUPATION:
MARITAL STATUS:
PLACE AND COUNTRY OF BIRTH:
RACE:
DATE OF DIAGNOSIS OF CANCER:
PLACE OF RESIDENCE OF PATIENT AT DIAGNOSIS OF CANCER:
DATE OF ADMISSION OR OUTPATIENT CONSULTATION:
PRIMARY SITE OF CANCER (where known):
MORPHOLOGICAL SUBTYPE OF CANCER (where known):
METHOD OF DIAGNOSIS OF CANCER:

By His Excellency's Command.

Clerk of the Council.

Appendix 2F. Cancer codes

(a) ICD-O Site codes

Codes[(1)]	Site/Topography
C00	Lip
C01 - C02	Tongue
C03	Gum
C04	Floor of mouth
C05 - C06	Palate, other & u/s parts of mouth
C07 - C08	Parotid & other major salivary gland
C09 - C10	Tonsil & oropharynx
C11	Nasopharynx
C12 - C13	Pyriform sinus & hypopharynx
C14	Pharynx, other & ill-def. sites
C15	Oesophagus
C16	Stomach
C17	Small intestine
C18	Colon
C19 - C20	Rectosigmoid junction & rectum
C21	Anus
C22	Liver & intrahepatic bile ducts
C23 - C24	Gallbladder & bile ducts
C25	Pancreas
C30 - C31	Nasal cavity & sinuses, middle & inner ear
C32	Larynx
C33 - C34	Lung, bronchus & trachea
C37	Thymus
C38	Pleura, heart & mediastinum
C40 - C41	Bones, joints & articular cartilages
C44	Skin
C47	Nervous system, peripheral & autonomic
C48	Retroperitoneum and peritoneum
C49	Connective, subcutaneous & other soft tissues
C50	Breast
C51 - C52	Vulva & Vagina
C53	Cervix uteri
C54	Corpus uteri (Uterus)
C55	Uterus, nos *(not used)*
C56 - C57	Ovary, uterine adnexa & other fem. genital
C58	Placenta
C60 & C63	Penis & other male genital organs
C61	Prostate gland
C62	Testis
C64 - C66 & C68	Kidney & other renal tract
C67	Urinary bladder
C69	Eye & lacrimal gland
C70	Meninges (cerebral & spinal)
C71	Brain
C72	Spinal cord & cranial nerves
C73	Thyroid gland
C74 - C75	Adrenal & other endocrine glands
C80	Unknown primary site

Notes: (1) Only 1st 3 characters are shown. Groupings are based on IARC rules governing the reporting of incident cancers for ICDO-2; implementation of the full system for ICDO-3 is intended for the Registry's next report.

Using these same rules, non-lymphohaematopoietic neoplasms of primary sites reported as C26 (Intestinal tract NOS), C39 (respiratory tract ill-defined / NOS), C42 (haematopoietic system), C76 (large body regions NOS) and C77 (lymph nodes) are tabulated as cancers of unknown primary site.

(b) Morphology code groups for lymphohaematopoietic malignancies

The tabulation scheme for lymphohaematopoietic neoplasms (LHNs) used in previous WACR reports was based on a combination of groupings used in ICD-O, ICD9 and ICD10, which reflected, to varying degrees, previous well-accepted classification schemes such as the REAL and the Working Formulation. Increasingly, classification of such tumours as used by pathologists and clinicians has changed, and older headings have become somewhat irrelevant to modern medical practice.

The tabulation groupings used in this report are based on those used in the ICDO-3 classification, which has been influenced by the WHO Classification of Haematopoietic and Lymphoid Neoplasms (2001). In the current report, group headings still retain terms such as lymphoma and leukaemia, for the sake of familiarity. While these names remain in the WHO scheme for individual conditions, group headings have in many cases been replaced by less-specific terms such as "B-Cell neoplasms" and "T-cell neoplasms" which may be unfamiliar to some users of Cancer Registry data. Depending on developments in this area (and on decisions made by other Registries, and by others who are concerned that cancer classification should be compatible with non-cancer disease classifications using ICD-10), future reports may eventually follow the WHO classification scheme.

As in our last Report, conditions previously not regarded as malignant (e.g. polycythaemia and myelodysplastic diseases) are now included as "cancers".

Revised multi-level tabulation scheme for reporting of Malignant lymphohaematopoietic neoplasms (WACR 2003)

			WACR code	ICDO-3 M codes
1 All lymphomas			Y**	
1a	Lymphomas, NOS/unclassifiable		YUC	9590
1b	Hodgkin lymphoma		YHO	9650-9667
1c	All NHL		YN*	
	1c1	NHL, mature B Cell	YNB	9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9699
	1c2	NHL, mature T / N-K cell	YNT	9700-9702, 9705, 9708-9709, 9714, 9716, 9717-9719
	1c3	NHL, precursor cell lymphoblastic	YNP	9727-9729
	1c4	NHL, other / unclassifiable	YNO	9591, 9596-9599*
	1c1x	NHL, Burkitt *(subset of 1c1)*	YNBB	9687
2 Myeloma/Plasma Cell tumours			P*	9731-9734
3 All leukaemias			L**	
3a	Leukaemias, NOS/unclassifiable		LUC	9800-9801, 9805
3b	Leukaemias, lymphoid, all		LL*	
	3b1	Leukaemias, lymphoid, acute	LLA	9836-9837
	3b2	Leukaemias, lymphoid, chronic	LLC	9823
	3b3	Leukaemias, lymphoid, other/NOS	LLO	9820,9826, 9827, 9831-9834,
3c	Leukaemias, myeloid, all		LM*	
	3c1	Leukaemias, myeloid, acute	LMA	9840, 9861, 9866-9867, 9870-9874, 9891,9895-9897, 9910,9920,9930-9931
	3c2	Leukaemias, myeloid, chronic	LMC	9863,9875-9876
	3c3	Leukaemias, myeloid, other & NOS	LMO	9860
3d	Other leukaemias		LOT	9940,9945-9946,9948
4 Other lymphohaematopoietic malignancies				
4a	Myelodysplastic diseases, all		HM*	
	4a1	Refractory anaemias/cytopaenias	HMR	9980-9985
	4a2	Myelodysplastic syndromes	HMS	9986-9989
4b	Chronic myeloproliferative diseases, all		HC*	
	4b1	Chronic MPD, NOS	HCX	9960
	4b2	Polycythaemia rubra vera	HCP	9950
	4b3	Myelofibrosis/sclerosis	HCS	9961
	4b4	Other chronic MPDs	HCO	9962-9964
4c	Other immunoproliferative malignancies		HI*	
	4c1	Mast cell tumours	HIM	9740-9742
	4c2	Malig. histiocytic/dendritic cell neoplasms	HIH	9750, 9754-9758
	4c3	Other & U/S immunoproliferative neoplasms	HII	9760-9764

*9597, *9598 and *9599 are W.A.C.R. codes for “NOS” NHL which are able to be grouped as low, intermediate or high grade respectively but which could only be otherwise placed in the ICDO classification as code 9591.

Appendix 2G. WACR publications

Note: It is strongly recommended that retrospective studies utilize time-series that have been produced using updated versions of historical data, available from the Registry; and that figures from old reports not be used for such purposes. However, various topics of interest may be found in previous publications listed here.

FitzGerald P, Thomson N and Thompson J (1994) *Cancer incidence and mortality in Western Australia 1991*. Health Department of Western Australia, Perth, Statistical Series number 39.

Thompson J, FitzGerald P (1995) *Childhood cancer incidence, mortality and survival in Western Australia 1982-1991*. Health Statistics Branch, Health Department of Western Australia, Perth.

Threlfall TJ, Whitfort MJ, Thompson JR (1996) *Cancer incidence and mortality in Western Australia, 1992-1994*. Health Department of Western Australia, Perth, Statistical Series number 45.

Threlfall T, Morgan A (1996) *Malignant mesothelioma in Western Australia, 1960 to 1994*. Health Department of Western Australia, Perth, Statistical Series number 46.

Threlfall TJ (1997) *Cancer incidence and mortality projections for Western Australia, 1996-2001*. Health Department of Western Australia, Perth, Statistical Series number 50.

Threlfall TJ, Thompson JR (1997) *Cancer incidence and mortality in Western Australia, 1995*. Health Department of Western Australia, Perth, Statistical Series number 51.

Threlfall TJ, Thompson JR (1998) *Cancer incidence and mortality in Western Australia, 1996*. Health Department of Western Australia, Perth, Statistical Series number 55.

Threlfall TJ, Thompson JR (1999) *Cancer incidence and mortality in Western Australia, 1997*. Health Department of Western Australia, Perth, Statistical Series number 57.

Threlfall TJ, Brameld K (2000) *Cancer survival in Western Australian residents, 1982-1997*. Health Department of Western Australia, Perth, Statistical Series number 60.

Threlfall TJ, Thompson JR (2000) *Cancer incidence and mortality in Western Australia, 1998*. Health Department of Western Australia, Perth, Statistical Series number 61.

Threlfall TJ, Thompson JR (2002) *Cancer incidence and mortality in Western Australia, 1999 and 2000*. Health Department of Western Australia, Perth, Statistical Series number 65.

Threlfall TJ, Thompson JR (2003) *Cancer incidence and mortality in Western Australia, 2001*. Health Department of Western Australia, Perth, Statistical Series number 68.

Threlfall TJ, Thompson JR (2004) *Cancer incidence and mortality in Western Australia, 2002.* Department of Health, Western Australia, Perth. Statistical series number 71.

Threlfall TJ, Thompson JR, Olsen N (2005). *Cancer in Western Australia: Incidence and mortality 2003 and Mesothelioma 1960-2003.* Department of Health, Western Australia, Perth. Statistical series number 74.

Appendix 2H. Guide to tables in Appendix 3

Note: The order of cancer types in the tables in Appendix 2F are the basis for the wide-format incidence and mortality tables in Appendix 3.

Terms and formatting

Terms used in table headings are explained under "Statistical methods" **(Section 1.4)** and abbreviations repeated in Appendix 2A.

Age groups are expressed in whole years, i.e. "10-14" means 10.0 to 14.99.... years.

For most cancers in the wide-format tables which follow, there are 2 rows for each sex. The upper one contains total cases, crude rate, ASR, ESE, risk and other summary statistics.

Under the headings for individual age groups, the upper rows also contain counts (cases or deaths) in whole numbers.

The numbers (1 decimal place) shown in the lower rows for each sex are age-specific rates per 100,000 for the relevant age group.

The larger, wide-format tables e.g. Appendices 3A, B and C, contain some sections which are summaries of others within the tables (e.g. "All Lymphomas"), hence the summation of case numbers or rates over all rows of the tables will not match the totals at the end of each table, which were calculated separately.

Order of cancer types within tables

In general, tables follow the order of cancer types as listed in **Appendix 2F**, with site-specific cancers listed first, then lymphohaematopoietic malignancies - lymphomas, myeloma, mast cell tumours, miscellaneous immunoproliferative tumours, then leukaemias - followed by the Unknown Primary Site and Total Cancers groups.

Note: The **mortality** appendix table includes deaths due to **all** non-melanoma skin cancers (NMSC), some of which are **not** listed in the Incidence tables. Some NMSC, such as Merkel cell or sweat gland carcinomas, are included in incidence statistics in this report, but these do NOT include basal cell carcinoma and squamous cell carcinoma (ICDO-3 morphology codes 8050 - 8110).

- Notes -

Appendix 3A now contains an incidence data summary for the most common cancer types on page A3-10.

Appendix 3A. Cancer incidence, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Lip (C000-C009)																										
M				1	1		4	2	8	10	11	13	10	11	11	9	8	2		**101**	**7.4**	5.9-8.8	100.0	0.8	120	10.7 (8.6-12.8)
				1.3	1.4		5.4	2.7	10.3	13.8	16.3	21.5	22.7	31.7	40.7	42.3	60.8	25.0								
F						3	1	3	2	3	4	9	5	7	11	6	7	5		**66**	**4.4**	3.3-5.6	100.0	0.5	186	6.5 (5.0-8.1)
						4.6	1.4	4.1	2.6	4.1	6.0	15.8	11.8	20.0	37.8	23.7	36.4	29.1								
Tongue (C010-C029)																										
M				1		1		2	3		3	3	8	6	3	2				**32**	**2.6**	1.7-3.5	100.0	0.3	306	3.3 (2.1-4.4)
				1.3		1.5		2.7	3.9		4.5	5.0	18.2	17.3	11.1	9.4										
F					1			1	2	2	3	2	3		1	1	1	3		**20**	**1.4**	0.7-2.0	95.0	0.1	751	1.9 (1.1-2.8)
					1.5			1.4	2.6	2.7	4.5	3.5	7.1		3.4	3.9	5.2	17.4								
Gum (C030-C039)																										
M										1				1		1				**3**	**0.2**	0 - 0.5	100.0	0.0	4702	0.3 (0 - 0.7)
										1.4				2.9		4.7										
F													2		2			1		**5**	**0.4**	0.0-0.7	100.0	0.1	1724	0.5 (0.1-1.0)
													4.7		6.9			5.8								
Floor of mouth (C040-C049)																										
M									1	2	1	3	1	3	1		1			**13**	**1.0**	0.4-1.5	100.0	0.1	797	1.3 (0.6-2.0)
									1.3	2.8	1.5	5.0	2.3	8.6	3.7		7.6									
F															1					**1**	**0.1**	0 - 0.2	100.0	0.0	5817	0.1 (0 - 0.3)
															3.4											
Palate, other & u/s parts of mouth (C050-C069)																										
M								1	1		3	2		3		1				**11**	**0.8**	0.3-1.3	100.0	0.1	1050	1.1 (0.4-1.8)
								1.4	1.3		4.5	3.3		8.6		4.7										
F											1	1	1	1	1		1	1		**7**	**0.4**	0.1-0.8	86.0	0.1	1681	0.7 (0.2-1.2)
											1.5	1.8	2.4	2.9	3.4		5.2	5.8								
Parotid & other major salivary gland (C070-C089)																										
M						1			1			1	1	1	1	4	1			**11**	**0.7**	0.3-1.2	100.0	0.1	1507	1.2 (0.5-2.0)
						1.5			1.3			1.7	2.3	2.9	3.7	18.8	7.6									
F			1					2	1				1	2		2	3			**12**	**0.8**	0.3-1.3	100.0	0.1	1477	1.2 (0.5-1.9)
			1.5					2.7	1.3				2.4	5.7		7.9	15.6									
Tonsil & oropharynx (C090-C109)																										
M								2	1	2	5	6	5	1	6					**28**	**2.2**	1.4-3.0	100.0	0.3	331	2.8 (1.8-3.9)
								2.7	1.3	2.8	7.4	9.9	11.4	2.9	22.2											
F										1	1				1		1			**4**	**0.3**	0 - 0.5	100.0	0.0	3177	0.4 (0.0-0.8)
										1.4	1.5				3.4		5.2									
Nasopharynx (C110-C119)																										
M								1		1		2		1						**5**	**0.4**	0.0-0.7	100.0	0.0	2238	0.5 (0.1-0.9)
								1.4		1.4		3.3		2.9												
F											1									**1**	**0.1**	0 - 0.2	100.0	0.0	*	0.1 (0 - 0.3)
											1.5															
Pyriform sinus & hypopharynx (C120-C139)																										
M									1	1			2	2	3	1	2			**12**	**0.9**	0.4-1.4	100.0	0.1	832	1.3 (0.6-2.1)
									1.3	1.4			4.5	5.8	11.1	4.7	15.2									
F											2									**2**	**0.1**	0 - 0.4	100.0	0.0	6682	0.2 (0 - 0.5)
											3.0															

Appendix 3A. Cancer incidence, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 + u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Pharynx, other & ill-def. sites (C140-C149)																									
M										1		1	2				1		**5**	**0.4**	0.0-0.7	100.0	0.0	2640	0.5 (0.1-1.0)
										1.4		1.7	4.5				7.6								
F																			**0**						
Oesophagus (C150-C159)																									
M									5	5	4	11	16	18	13	10	8	5	**95**	**6.9**	5.5-8.3	99.0	0.9	116	10.4 (8.3-12.5)
									6.4	6.9	5.9	18.2	36.4	51.8	48.1	47.0	60.8	62.5							
F									1			5	5	4	3	6	11	2	**37**	**2.0**	1.3-2.8	97.0	0.2	459	3.6 (2.4-4.7)
									1.3			8.8	11.8	11.4	10.3	23.7	57.3	11.6							
Stomach (C160-C169)																									
M								3	2	1	2	12	13	8	12	22	8	8	**91**	**6.0**	4.7-7.3	97.0	0.6	157	10.5 (8.3-12.7)
								4.1	2.6	1.4	3.0	19.9	29.5	23.0	44.4	103.5	60.8	100.0							
F							2	1		1	2	2	2	7	2	15	15	9	**58**	**2.8**	2.0-3.6	91.0	0.2	460	5.5 (4.1-7.0)
							2.7	1.4		1.4	3.0	3.5	4.7	20.0	6.9	59.2	78.1	52.3							
Small intestine (C170-C179)																									
M									1	3	2	3	3	5		1	2		**20**	**1.5**	0.8-2.2	95.0	0.2	579	2.0 (1.1-2.9)
									1.3	4.1	3.0	5.0	6.8	14.4		4.7	15.2								
F								1		1		2	3	1	2	2	1	1	**14**	**0.9**	0.4-1.5	93.0	0.1	868	1.4 (0.7-2.1)
								1.4		1.4		3.5	7.1	2.9	6.9	7.9	5.2	5.8							
Colorectal cancer (C18-C20, C218)																									
M					1			5	13	27	51	67	80	85	90	95	62	36	**612**	**42.3**	38.9-45.8	97.0	5.0	20	68.7 (63.2-74.2)
					1.4			6.8	16.7	37.1	75.8	111.1	181.8	244.7	333.0	446.7	471.6	450.0							
F					4	1	3	5	11	12	40	39	55	59	61	67	64	56	**477**	**29.2**	26.3-32.0	96.0	3.4	30	46.6 (42.4-50.8)
					5.8	1.5	4.1	6.8	14.2	16.3	59.9	68.3	130.0	168.4	209.8	264.3	333.2	325.4							
Colon (C180-C189)																									
M								1	6	17	23	40	41	52	61	59	36	28	**364**	**24.9**	22.3-27.6	96.0	3.0	34	41.6 (37.2-45.9)
								1.4	7.7	23.4	34.2	66.3	93.2	149.7	225.7	277.5	273.8	350.0							
F					4		3	3	4	8	22	28	33	40	44	52	48	45	**334**	**19.7**	17.4-22.0	94.0	2.3	44	32.5 (29.0-36.0)
					5.8		4.1	4.1	5.2	10.9	32.9	49.0	78.0	114.2	151.3	205.1	249.9	261.5							
Rectosigmoid junction & rectum (C190-C209)																									
M					1			4	7	10	28	27	39	33	29	36	25	8	**247**	**17.4**	15.1-19.6	98.0	2.0	50	27.0 (23.6-30.4)
					1.4			5.5	9.0	13.8	41.6	44.8	88.6	95.0	107.3	169.3	190.1	100.0							
F						1		2	7	4	17	11	21	19	17	15	16	11	**141**	**9.3**	7.7-10.9	99.0	1.1	89	13.9 (11.6-16.2)
						1.5		2.7	9.0	5.4	25.4	19.3	49.6	54.2	58.5	59.2	83.3	63.9							
Anus (C210-C219)																									
M													2	2			2		**6**	**0.4**	0.1-0.8	83.0	0.1	1942	0.7 (0.1-1.2)
													4.5	5.8			15.2								
F											3	2	4	1	1				**11**	**0.9**	0.4-1.4	100.0	0.1	843	1.1 (0.4-1.7)
											4.5	3.5	9.5	2.9	3.4										
Liver & intrahepatic bile ducts (C220-C229)																									
M	1				1				3	5	5	4	3	7	8	7	10		**54**	**3.8**	2.7-4.8	48.0	0.4	238	6.0 (4.4-7.6)
	1.6				1.4				3.9	6.9	7.4	6.6	6.8	20.2	29.6	32.9	76.1								
F						1				2	4	1			3	8	1	1	**21**	**1.2**	0.7-1.8	48.0	0.1	897	2.1 (1.2-3.1)
						1.5				2.7	6.0	1.8			10.3	31.6	5.2	5.8							

Appendix 3A. Cancer incidence, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Gallbladder & bile ducts (C230-C249)																										
M										1	3	3	3	3	2	6	4	4		**29**	**1.9**	1.2-2.6	72.0	0.2	595	3.4 (2.2-4.7)
										1.4	4.5	5.0	6.8	8.6	7.4	28.2	30.4	50.0								
F											2	2	4	3	3	5	2	8		**29**	**1.6**	1.0-2.3	66.0	0.2	575	2.8 (1.8-3.8)
											3.0	3.5	9.5	8.6	10.3	19.7	10.4	46.5								
Pancreas (C250-C259)																										
M									4	3	4	9	10	11	13	13	9	4		**80**	**5.5**	4.2-6.7	70.0	0.7	151	9.0 (7.0-11.0)
									5.2	4.1	5.9	14.9	22.7	31.7	48.1	61.1	68.5	50.0								
F										2	3	9	14	14	16	12	21	14		**105**	**6.1**	4.8-7.3	55.0	0.8	133	10.2 (8.2-12.1)
										2.7	4.5	15.8	33.1	40.0	55.0	47.3	109.3	81.4								
Nasal cavity & sinuses, middle & inner ear (C300-C319)																										
M											3			1	3	1	2	1		**11**	**0.7**	0.3-1.2	100.0	0.1	1085	1.3 (0.5-2.1)
											4.5			2.9	11.1	4.7	15.2	12.5								
F													1		2					**3**	**0.2**	0 - 0.5	67.0	0.0	2165	0.3 (0 - 0.7)
													2.4		6.9											
Larynx (C320-C329)																										
M										1	3	7	8	2	9	7	2	1		**40**	**2.8**	1.9-3.7	100.0	0.4	268	4.4 (3.0-5.8)
										1.4	4.5	11.6	18.2	5.8	33.3	32.9	15.2	12.5								
F														2	1		1	1		**5**	**0.3**	0.0-0.6	100.0	0.0	2187	0.5 (0.1-0.9)
														5.7	3.4		5.2	5.8								
Lung, bronchus & trachea (C330-C349)																										
M					1			1	2	14	15	40	55	73	100	102	77	41		**521**	**34.3**	31.2-37.3	88.0	4.1	25	61.3 (56.0-66.7)
					1.4			1.4	2.6	19.3	22.3	66.3	125.0	210.1	370.1	479.7	585.6	512.5								
F							1	1	4	15	14	28	29	50	53	55	36	22		**308**	**19.1**	16.8-21.4	87.0	2.5	41	30.6 (27.2-34.1)
							1.4	1.4	5.2	20.4	21.0	49.0	68.6	142.7	182.2	216.9	187.4	127.9								
Thymus (C370-C379)																										
M							1						2							**3**	**0.3**	0 - 0.6	100.0	0.0	3398	0.3 (0 - 0.6)
							1.3						4.5													
F																				**0**						
Pleura, heart & mediastinum (C380-C389)																										
M																				**0**						
F															1					**1**	**0.1**	0 - 0.2	100.0	0.0	5817	0.1 (0 - 0.3)
															3.4											
Bones, joints & articular cartilages (C400-C419)																										
M			2	1		2				1	1		2			1	1			**11**	**1.0**	0.4-1.7	100.0	0.1	1382	1.1 (0.5-1.8)
			2.8	1.3		3.0				1.4	1.5		4.5			4.7	7.6									
F	1	1	1	1	1		1		1											**7**	**0.9**	0.2-1.6	100.0	0.1	1971	0.7 (0.2-1.2)
	1.6	1.5	1.5	1.4	1.5		1.4		1.3																	
Skin (melanoma only) (C440-C449; M-8720 - 8774)																										
M				2	6	10	22	26	25	39	56	60	70	62	50	59	37	25		**549**	**40.4**	37.0-43.9	100.0	4.4	23	59.3 (54.3-64.3)
				2.7	8.3	14.8	29.5	35.6	32.2	53.6	83.2	99.4	159.1	178.5	185.0	277.5	281.4	312.5								
F				2	7	10	27	22	20	45	47	48	38	33	24	35	19	21		**398**	**29.0**	26.0-31.9	99.0	3.0	34	39.3 (35.4-43.1)
				2.8	10.2	15.2	36.8	30.0	25.8	61.3	70.3	84.0	89.8	94.2	82.5	138.0	98.9	122.0								

Appendix 3A. Cancer incidence, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 + u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Skin (not melanoma/SCC/BCC) (C440-C449)																									
M					1	2	2	1	2	2	5	6	7	4	4	10	5	10	**61**	**4.2**	3.1-5.3	98.0	0.4	273	7.2 (5.3-9.0)
					1.4	3.0	2.7	1.4	2.6	2.8	7.4	9.9	15.9	11.5	14.8	47.0	38.0	125.0							
F							1	1	1	1	5	3	1	2	5	2	8	4	**34**	**1.9**	1.2-2.6	100.0	0.2	462	3.3 (2.2-4.4)
							1.4	1.4	1.3	1.4	7.5	5.3	2.4	5.7	17.2	7.9	41.7	23.2							
Mesothelioma (M905; ICD10 C45)																									
M										4	6	7	4	9	10	8	9	3	**60**	**4.0**	3.0-5.1	100.0	0.5	205	6.8 (5.0-8.5)
										5.5	8.9	11.6	9.1	25.9	37.0	37.6	68.5	37.5							
F									1	1	1		4	2		1	1	1	**12**	**0.9**	0.4-1.4	100.0	0.1	1036	1.2 (0.5-1.8)
									1.3	1.4	1.5		9.5	5.7		3.9	5.2	5.8							
Kaposi sarcoma (M914; ICD10 C46)																									
M									1		2	1						1	**5**	**0.4**	0.0-0.7	60.0	0.0	3380	0.6 (0.1-1.1)
									1.3		3.0	1.7						12.5							
F																	1		**1**	**0.0**	0 - 0.1	100.0	0.0	*	0.1 (0 - 0.3)
																	5.2								
Nervous system, peripheral & autonomic (C470-C479)																									
M			1					1					1			1			**4**	**0.3**	0 - 0.7	100.0	0.0	3983	0.4 (0.0-0.8)
			1.4					1.4					2.3			4.7									
F														1					**1**	**0.1**	0 - 0.3	0.0	0.0	7007	0.1 (0 - 0.3)
														2.9											
Retroperitoneum and peritoneum (C480-C489)																									
M								1							1	1			**3**	**0.2**	0 - 0.4	100.0	0.0	3947	0.4 (0 - 0.8)
								1.4							3.7	4.7									
F													5	2		2	1	1	**11**	**0.8**	0.3-1.3	100.0	0.1	1141	1.1 (0.4-1.7)
													11.8	5.7		7.9	5.2	5.8							
Connective, subcutaneous & other soft tissues (C490-C499)																									
M	1				1		1	1	1		3		1	2	2	5	2		**20**	**1.5**	0.8-2.2	100.0	0.1	746	2.2 (1.2-3.2)
	1.6				1.4		1.3	1.4	1.3		4.5		2.3	5.8	7.4	23.5	15.2								
F	1	1			1	2	1	2	1	1		2	1	1	1	1	1	2	**19**	**1.6**	0.8-2.4	95.0	0.1	753	1.9 (1.0-2.7)
	1.6	1.5			1.5	3.0	1.4	2.7	1.3	1.4		3.5	2.4	2.9	3.4	3.9	5.2	11.6							
Breast (C500-C509)																									
M										2	1	1	2	1	1	1			**9**	**0.7**	0.2-1.2	89.0	0.1	1176	0.9 (0.3-1.5)
										2.8	1.5	1.7	4.5	2.9	3.7	4.7									
F						5	19	42	91	148	189	158	123	110	87	63	66	49	**1150**	**82.6**	77.7-87.5	99.0	9.4	11	112.9 (106-119)
						7.6	25.9	57.3	117.3	201.6	282.9	276.6	290.8	314.0	299.2	248.5	343.6	284.8							
Vulva/vagina (C510-C529)																									
F								2	1	1	4	5	5	5	3	4	2	2	**34**	**2.3**	1.5-3.2	97.0	0.3	354	3.4 (2.2-4.5)
								2.7	1.3	1.4	6.0	8.8	11.8	14.3	10.3	15.8	10.4	11.6							
Cervix uteri (C530-C539)																									
F				1		5	9	14	8	10	8	5	6	3	6	6	2	2	**85**	**6.6**	5.1-8.0	100.0	0.6	156	8.6 (6.8-10.4)
				1.4		7.6	12.3	19.1	10.3	13.6	12.0	8.8	14.2	8.6	20.6	23.7	10.4	11.6							
Corpus uteri (C540-C549)																									
F							2	1	4	11	15	29	17	21	14	17	8	10	**149**	**10.1**	8.4-11.8	99.0	1.2	82	14.6 (12.2-16.9)
							2.7	1.4	5.2	15.0	22.5	50.8	40.2	59.9	48.1	67.1	41.7	58.1							
Uterus, nos (C550-C559)																									
F													1					1	**2**	**0.1**	0 - 0.3	50.0	0.0	8460	0.2 (0 - 0.4)
													2.4					5.8							

Appendix 3A. Cancer incidence, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Ovary, uterine adnexa & other female genital (C560-C579)																										
F					1	4	1	5	8	8	16	17	17	16	15	13	12	9		**142**	**9.9**	8.1-11.6	90.0	1.1	88	14.0 (11.7-16.3)
					1.5	6.1	1.4	6.8	10.3	10.9	23.9	29.8	40.2	45.7	51.6	51.3	62.5	52.3								
Placenta (C580-C589)																										
F																				**0**						
Penis & other male genital organs (C600-C639) (not C61 C62)																										
M							1	2	1		1	1	3		1		1			**11**	**0.8**	0.3-1.4	100.0	0.1	1052	1.1 (0.5-1.8)
							1.3	2.7	1.3		1.5	1.7	6.8		3.7		7.6									
Prostate gland (C610-C619)																										
M							1		7	30	108	215	233	298	236	201	103	69		**1501**	**107.4**	102-113	99.0	14.1	8	164.6 (156-173)
							1.3		9.0	41.3	160.5	356.4	529.4	857.8	873.3	945.2	783.4	862.5								
Testis (C620-C629)																										
M				4	12	15	12	16	9	5	6				1					**80**	**7.5**	5.8-9.2	99.0	0.6	177	8.1 (6.3-9.9)
				5.4	16.6	22.2	16.1	21.9	11.6	6.9	8.9				3.7											
Kidney & other renal tract (C640-C689) (not C67)																										
M	2	1					2	2	6	7	7	14	27	18	21	14	11	6		**138**	**10.4**	8.6-12.2	90.0	1.3	80	15.1 (12.5-17.6)
	3.1	1.5					2.7	2.7	7.7	9.6	10.4	23.2	61.4	51.8	77.7	65.8	83.7	75.0								
F	1							2	4	5	6	6	8	13	7	11	13	9		**85**	**5.3**	4.1-6.6	92.0	0.6	173	8.3 (6.5-10.0)
	1.6							2.7	5.2	6.8	9.0	10.5	18.9	37.1	24.1	43.4	67.7	52.3								
Urinary bladder (C670-C679)																										
M				1		1			3	2	5	7	17	18	31	28	20	13		**146**	**9.8**	8.1-11.4	95.0	1.2	86	17.3 (14.5-20.2)
				1.3		1.5			3.9	2.8	7.4	11.6	38.6	51.8	114.7	131.7	152.1	162.5								
F										3		1	1	1	7	8	8	12		**41**	**1.8**	1.2-2.5	98.0	0.2	570	3.9 (2.7-5.1)
										4.1		1.8	2.4	2.9	24.1	31.6	41.7	69.7								
Eye & lacrimal gland (C690-C699)																										
M	4						1	1	3		3	1	1	1	2		1	1		**19**	**1.9**	0.9-2.8	68.0	0.2	635	2.0 (1.1-3.0)
	6.3						1.3	1.4	3.9		4.5	1.7	2.3	2.9	7.4		7.6	12.5								
F	1									1	2				1		1			**6**	**0.5**	0.0-1.0	67.0	0.0	2121	0.6 (0.1-1.1)
	1.6									1.4	3.0				3.4		5.2									
Meninges (cerebral & spinal) (C700-C709)																										
M																1				**1**	**0.0**	0 - 0.1	100.0	0.0	*	0.1 (0 - 0.4)
																4.7										
F															1					**1**	**0.1**	0 - 0.2	100.0	0.0	5817	0.1 (0 - 0.3)
															3.4											
Brain (C710-C719)																										
M	5			4	1	1	2	1	2	7	7	8	5	11	6	12	1			**73**	**6.1**	4.6-7.7	85.0	0.6	165	7.6 (5.9-9.4)
	7.8			5.4	1.4	1.5	2.7	1.4	2.6	9.6	10.4	13.3	11.4	31.7	22.2	56.4	7.6									
F	1		2	1	1			3		3	6	10	4	8	2	5	2	1		**49**	**3.8**	2.7-5.0	86.0	0.4	247	4.8 (3.5-6.2)
	1.6		2.9	1.4	1.5			4.1		4.1	9.0	17.5	9.5	22.8	6.9	19.7	10.4	5.8								
Spinal cord & cranial nerves (C720-C729)																										
M														1	1					**2**	**0.2**	0 - 0.4	100.0	0.0	3040	0.2 (0 - 0.5)
														2.9	3.7											
F			1																	**1**	**0.1**	0 - 0.4	0.0	0.0	*	0.1 (0 - 0.3)
			1.5																							

Appendix 3A. Cancer incidence, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 + u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Thyroid gland (C730-C739)																									
M				1	1	4	1	1	1	7	9	4	4	4	6	2			**45**	**3.7**	2.6-4.8	100.0	0.4	236	4.6 (3.3-6.0)
				1.3	1.4	5.9	1.3	1.4	1.3	9.6	13.4	6.6	9.1	11.5	22.2	9.4									
F				2	3	7	10	9	18	15	10	14	8	7	10	2	2		**117**	**9.5**	7.8-11.3	99.0	1.0	100	11.7 (9.6-13.9)
				2.8	4.4	10.7	13.6	12.3	23.2	20.4	15.0	24.5	18.9	20.0	34.4	7.9	10.4								
Adrenal & other endocrine glands (C740-C759)																									
M	1												1	1					**3**	**0.4**	0 - 0.8	100.0	0.0	2976	0.3 (0 - 0.6)
	1.6												2.3	2.9											
F	4		1					1				2		1					**9**	**1.2**	0.4-2.1	100.0	0.1	1273	0.9 (0.3-1.5)
	6.5		1.5					1.4				3.5		2.9											
LYMPHOMAS																									
Lymphoma, NOS / unclassifiable																									
M						1				1						3	4		**9**	**0.5**	0.1-0.9	78.0	0.0	7006	1.1 (0.4-1.8)
						1.5				1.4						14.1	30.4								
F								1	1				2	1	2	2			**9**	**0.7**	0.2-1.1	78.0	0.1	1169	0.9 (0.3-1.6)
								1.4	1.3				4.7	2.9	6.9	7.9									
Hodgkin lymphoma																									
M				1	1	2	2	3	3	2	1	1	2	1	2				**21**	**1.8**	1.0-2.6	100.0	0.2	540	2.1 (1.2-3.0)
				1.3	1.4	3.0	2.7	4.1	3.9	2.8	1.5	1.7	4.5	2.9	7.4										
F			1	3	2	4	2	3		1		1		1	4		1		**23**	**2.2**	1.3-3.1	100.0	0.2	485	2.4 (1.4-3.4)
			1.5	4.3	2.9	6.1	2.7	4.1		1.4		1.8		2.9	13.8		5.2								
All NHL																									
M			2	1	2	1	4	3	8	12	9	19	12	25	26	21	21	10	**176**	**12.4**	10.5-14.3	98.0	1.4	71	19.7 (16.7-22.6)
			2.8	1.3	2.8	1.5	5.4	4.1	10.3	16.5	13.4	31.5	27.3	72.0	96.2	98.8	159.7	125.0							
F				1	4		2	4	9	9	15	14	17	15	22	12	16	20	**160**	**10.5**	8.8-12.2	99.0	1.2	82	15.6 (13.2-18.0)
				1.4	5.8		2.7	5.5	11.6	12.3	22.5	24.5	40.2	42.8	75.6	47.3	83.3	116.2							
NHL, mature B cell																									
M			1	1	2	1	4	2	7	11	8	13	9	18	20	15	11	7	**130**	**9.4**	7.7-11.1	98.0	1.1	92	14.4 (11.9-16.9)
			1.4	1.3	2.8	1.5	5.4	2.7	9.0	15.1	11.9	21.5	20.5	51.8	74.0	70.5	83.7	87.5							
F				1	4		2	3	6	8	14	9	11	13	16	7	8	10	**112**	**7.8**	6.3-9.4	100.0	0.9	107	11.0 (9.0-13.1)
				1.4	5.8		2.7	4.1	7.7	10.9	21.0	15.8	26.0	37.1	55.0	27.6	41.7	58.1							
NHL, mature T/NK cell																									
M												1	1	2	1	4	1	1	**11**	**0.7**	0.3-1.1	100.0	0.1	1494	1.3 (0.5-2.1)
												1.7	2.3	5.8	3.7	18.8	7.6	12.5							
F								1	1				2				1	2	**7**	**0.4**	0.1-0.8	100.0	0.0	2710	0.7 (0.2-1.1)
								1.4	1.3				4.7				5.2	11.6							
NHL, precursor cell lymphoblastic																									
M			1																**1**	**0.1**	0 - 0.4	100.0	0.0	*	0.1 (0 - 0.3)
			1.4																						
F																			**0**						
NHL, other/unclassifiable																									
M								1	1	1	1	5	2	5	5	2	9	2	**34**	**2.2**	1.4-3.0	97.0	0.3	391	3.9 (2.6-5.2)
								1.4	1.3	1.4	1.5	8.3	4.5	14.4	18.5	9.4	68.5	25.0							
F									2	1	1	5	4	2	6	5	7	8	**41**	**2.2**	1.5-3.0	98.0	0.2	401	3.9 (2.7-5.1)
									2.6	1.4	1.5	8.8	9.5	5.7	20.6	19.7	36.4	46.5							

Appendix 3A. Cancer incidence, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Lymphomas (all)																										
M			2	2	3	4	6	6	11	15	10	20	14	26	28	24	25	10		**206**	**14.7**	12.6-16.8	98.0	1.6	62	22.9 (19.7-26.1)
			2.8	2.7	4.1	5.9	8.1	8.2	14.2	20.6	14.9	33.1	31.8	74.8	103.6	112.9	190.1	125.0								
F			1	4	6	4	4	8	10	10	15	15	19	17	28	14	17	20		**192**	**13.3**	11.3-15.3	98.0	1.5	66	18.9 (16.2-21.6)
			1.5	5.7	8.7	6.1	5.5	10.9	12.9	13.6	22.5	26.3	44.9	48.5	96.3	55.2	88.5	116.2								
MYELOMA																										
Myeloma/plasma cell tumours																										
M								1	2	3	5	7	4	14	7	6	8	2		**59**	**4.1**	3.0-5.2	86.0	0.5	196	6.5 (4.8-8.2)
								1.4	2.6	4.1	7.4	11.6	9.1	40.3	25.9	28.2	60.8	25.0								
F									1	1	3	6	4	3	9	5	10	8		**50**	**2.7**	1.9-3.6	88.0	0.3	301	4.8 (3.5-6.1)
									1.3	1.4	4.5	10.5	9.5	8.6	30.9	19.7	52.1	46.5								
LEUKAEMIAS																										
Leukaemias, NOS/unclassifiable																										
M																1				**1**	**0.0**	0 - 0.1	100.0	0.0	*	0.1 (0 - 0.4)
																4.7										
F																				**0**						
Leukaemias, lymphoid, all																										
M	3	3	2	1	1			1		2	11	8	10	14	10	9	6	5		**86**	**6.9**	5.3-8.5	98.0	0.7	135	9.4 (7.4-11.5)
	4.7	4.4	2.8	1.3	1.4			1.4		2.8	16.3	13.3	22.7	40.3	37.0	42.3	45.6	62.5								
F	3	2	2			1		2		4		2	3	6	4	5	4	4		**42**	**3.4**	2.2-4.6	98.0	0.3	323	4.2 (2.9-5.4)
	4.9	3.1	2.9			1.5		2.7		5.4		3.5	7.1	17.1	13.8	19.7	20.8	23.2								
Leukaemias, lymphoid, acute																										
M	3	3	2	1	1						1	1					1	1		**14**	**1.7**	0.8-2.7	100.0	0.1	1129	1.5 (0.7-2.3)
	4.7	4.4	2.8	1.3	1.4						1.5	1.7					7.6	12.5								
F	3	2	2			1		1		1			1			1	1			13	**1.6**	0.7-2.6	100.0	0.1	1143	1.3 (0.6-2.1)
	4.9	3.1	2.9			1.5		1.4		1.4			2.4			3.9	5.2									
Leukaemias, lymphoid, chronic																										
M								1		2	10	7	8	14	10	9	5	3		**69**	**4.9**	3.7-6.1	97.0	0.6	159	7.6 (5.8-9.4)
								1.4		2.8	14.9	11.6	18.2	40.3	37.0	42.3	38.0	37.5								
F								1		3		2	2	6	3	4	2	4		**27**	**1.7**	1.0-2.4	96.0	0.2	487	2.6 (1.6-3.6)
								1.4		4.1		3.5	4.7	17.1	10.3	15.8	10.4	23.2								
Leukaemias, lymphoid, other/NOS																										
M													2					1		**3**	**0.2**	0 - 0.5	100.0	0.0	4401	0.4 (0 - 0.8)
													4.5					12.5								
F															1		1			**2**	**0.1**	0 - 0.2	100.0	0.0	5817	0.2 (0 - 0.5)
															3.4		5.2									
Leukaemias, myeloid, all																										
M			1	1	5		3	2	1		4	2	1	4	4	8	2	3		**41**	**3.1**	2.1-4.1	100.0	0.3	361	4.6 (3.2-6.0)
			1.4	1.3	6.9		4.0	2.7	1.3		5.9	3.3	2.3	11.5	14.8	37.6	15.2	37.5								
F	1			1	1			1	1	2	4	3	1	6	5	4	4	8		**42**	**2.7**	1.8-3.6	98.0	0.3	346	4.1 (2.8-5.3)
	1.6			1.4	1.5			1.4	1.3	2.7	6.0	5.3	2.4	17.1	17.2	15.8	20.8	46.5								
Leukaemias, myeloid, acute																										
M			1	1	4		3		1		3	2		3	1	8		3		**30**	**2.3**	1.4-3.1	100.0	0.2	594	3.4 (2.1-4.6)
			1.4	1.3	5.5		4.0		1.3		4.5	3.3		8.6	3.7	37.6		37.5								
F	1				1				1	2	2	3		5	4	4	4	5		**32**	**2.0**	1.2-2.8	97.0	0.2	462	3.1 (2.0-4.2)
	1.6				1.5				1.3	2.7	3.0	5.3		14.3	13.8	15.8	20.8	29.1								

Appendix 3A. Cancer incidence, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 + u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Leukaemias, myeloid, chronic																									
M					1			2			1		1	1	3		1		**10**	**0.8**	0.3-1.3	100.0	0.1	916	1.1 (0.4-1.8)
					1.4			2.7			1.5		2.3	2.9	11.1		7.6								
F				1				1			2		1	1				3	**9**	**0.6**	0.2-1.1	100.0	0.1	1820	0.8 (0.3-1.4)
				1.4				1.4			3.0		2.4	2.9				17.4							
Leukaemias, myeloid, other/NOS																									
M																	1		**1**	**0.0**	0 - 0.1	100.0	0.0	*	0.1 (0 - 0.4)
																	7.6								
F															1				**1**	**0.1**	0 - 0.2	100.0	0.0	5817	0.1 (0 - 0.3)
															3.4										
Leukaemias, other																									
M									1		1		1	1	1	5	4	1	**15**	**0.9**	0.4-1.3	100.0	0.1	1721	1.8 (0.9-2.8)
									1.3		1.5		2.3	2.9	3.7	23.5	30.4	12.5							
F									1					1			1	1	**4**	**0.2**	0 - 0.5	100.0	0.0	4827	0.4 (0.0-0.7)
									1.3					2.9			5.2	5.8							
Leukaemias (all)																									
M	3	3	3	2	6		3	3	2	2	16	10	12	19	15	23	12	9	**143**	**10.9**	9.0-12.8	99.0	1.1	93	16.0 (13.3-18.7)
	4.7	4.4	4.1	2.7	8.3		4.0	4.1	2.6	2.8	23.8	16.6	27.3	54.7	55.5	108.2	91.3	112.5							
F	4	2	2	1	1	1		3	2	6	4	5	4	13	9	9	9	13	**88**	**6.3**	4.8-7.9	98.0	0.6	162	8.6 (6.8-10.4)
	6.5	3.1	2.9	1.4	1.5	1.5		4.1	2.6	8.2	6.0	8.8	9.5	37.1	30.9	35.5	46.9	75.6							
MYELODYSPLASTIC DISEASES																									
Refractory anaemias/cytopaenias																									
M												1		2	5	3	3	3	**17**	**1.1**	0.5-1.6	88.0	0.1	772	2.2 (1.1-3.2)
												1.7		5.8	18.5	14.1	22.8	37.5							
F											2	2				1	2	2	**9**	**0.4**	0.1-0.8	89.0	0.0	3080	0.8 (0.3-1.4)
											3.0	3.5				3.9	10.4	11.6							
Myelodysplastic syndromes																									
M										1		3	1	2	5	10	8	6	**36**	**2.1**	1.4-2.8	86.0	0.2	609	4.6 (3.1-6.1)
										1.4		5.0	2.3	5.8	18.5	47.0	60.8	75.0							
F											1	1	3	1	4	1	5	10	**26**	**1.2**	0.7-1.8	92.0	0.1	743	2.4 (1.5-3.3)
											1.5	1.8	7.1	2.9	13.8	3.9	26.0	58.1							
Myelodysplastic diseases, all																									
M										1		4	1	4	10	13	11	9	**53**	**3.1**	2.2-4.0	87.0	0.3	341	6.8 (4.9-8.6)
										1.4		6.6	2.3	11.5	37.0	61.1	83.7	112.5							
F											3	3	3	1	4	2	7	12	**35**	**1.7**	1.1-2.3	91.0	0.2	599	3.2 (2.1-4.3)
											4.5	5.3	7.1	2.9	13.8	7.9	36.4	69.7							
CHRONIC MYELOPROLIFERATIVE DISEASES																									
Chronic myeloproliferative disorder, NOS																									
M													1	1	1	2	1	2	**8**	**0.5**	0.1-0.9	100.0	0.0	2260	1.0 (0.3-1.8)
													2.3	2.9	3.7	9.4	7.6	25.0							
F										1			1		2	4	1	1	**10**	**0.5**	0.2-0.9	100.0	0.1	1887	1.0 (0.4-1.6)
										1.4			2.4		6.9	15.8	5.2	5.8							
Polycythaemia rubra vera																									
M							1		1				4	2	3		1		**12**	**1.0**	0.4-1.5	75.0	0.1	700	1.3 (0.6-2.0)
							1.3		1.3				9.1	5.8	11.1		7.6								
F									1					1			1	1	**4**	**0.2**	0 - 0.5	75.0	0.0	4827	0.4 (0.0-0.7)
									1.3					2.9			5.2	5.8							

Appendix 3A. Cancer incidence, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Myelofibrosis/sclerosis																										
M											1		2		3	3	2			**11**	**0.7**	0.3-1.1	73.0	0.1	1168	1.3 (0.5-2.1)
											1.5		4.5		11.1	14.1	15.2									
F															1	2		1		**4**	**0.2**	0 - 0.4	50.0	0.0	5817	0.4 (0.0-0.8)
															3.4	7.9		5.8								
Other chronic myeloproliferative d/o																										
M							1			1	1	1	4		3		1			**12**	**0.9**	0.4-1.5	92.0	0.1	768	1.3 (0.5-2.0)
							1.3			1.4	1.5	1.7	9.1		11.1		7.6									
F								1		2	1				3	2	2	3		**14**	**0.7**	0.3-1.2	100.0	0.1	1258	1.4 (0.6-2.1)
								1.4		2.7	1.5				10.3	7.9	10.4	17.4								
Chronic myeloproliferative d/o, all																										
M							2		1	1	2	1	11	3	10	5	5	2		**43**	**3.1**	2.1-4.0	84.0	0.4	249	4.9 (3.4-6.4)
							2.7		1.3	1.4	3.0	1.7	25.0	8.6	37.0	23.5	38.0	25.0								
F								1	1	3	1		1	1	6	8	4	6		**32**	**1.7**	1.0-2.3	91.0	0.2	587	3.1 (2.0-4.2)
								1.4	1.3	4.1	1.5		2.4	2.9	20.6	31.6	20.8	34.9								
OTHER CHRONIC IMMUNOPROLIFERATIVE DISEASES																										
Mast cell tumours																										
M																				**0**						
F						1							1							**2**	**0.2**	0 - 0.5	100.0	0.0	5145	0.2 (0 - 0.5)
						1.5							2.4													
Histiocytic/dendritic cell malignancies																										
M																				**0**						
F																				**0**						
Other & U/S immunoproliferative neoplasms																										
M											1			1						**2**	**0.2**	0 - 0.4	100.0	0.0	4582	0.2 (0 - 0.5)
											1.5			2.9												
F													1		1	1		1		**4**	**0.2**	0 - 0.5	100.0	0.0	3447	0.4 (0.0-0.8)
													2.4		3.4	3.9		5.8								
Other chronic immunoproliferative d/o, all																										
M											1			1						**2**	**0.2**	0 - 0.4	100.0	0.0	4582	0.2 (0 - 0.5)
											1.5			2.9												
F						1							2		1	1		1		**6**	**0.4**	0.1-0.8	100.0	0.0	2064	0.6 (0.1-1.1)
						1.5							4.7		3.4	3.9		5.8								
Unknown primary site (C26, C39, C76, C80; Behaviour 6/9)																										
M					1	1		2	1	5	8	12	14	19	19	26	26	21		**155**	**10.1**	8.5-11.8	74.0	1.0	99	18.6 (15.6-21.6)
					1.4	1.5		2.7	1.3	6.9	11.9	19.9	31.8	54.7	70.3	122.3	197.7	262.5								
F						1	1	1	5	2	2	8	11	10	12	18	20	25		**116**	**6.2**	5.0-7.5	69.0	0.6	159	11.0 (9.0-13.1)
						1.5	1.4	1.4	6.4	2.7	3.0	14.0	26.0	28.5	41.3	71.0	104.1	145.3								
All cancers																										
M	17	4	8	19	36	42	61	82	124	211	378	566	658	760	737	723	476	283		**5185**	**370.1**	360-380	95.0	43.7	3	577.0 (561-593)
	26.7	5.8	11.1	25.6	49.8	62.1	81.9	112.2	159.7	290.2	561.8	938.1	1495.2	2187.7	2727.3	3400.0	3620.3	3537.5								
F	13	4	9	12	26	45	83	131	198	314	416	439	411	422	417	407	379	333		**4059**	**274.0**	265-283	94.0	30.7	4	398.3 (386-411)
	21.3	6.2	13.1	17.0	37.8	68.6	113.2	178.7	255.2	427.6	622.6	768.4	971.7	1204.6	1433.9	1605.3	1973.3	1935.3								

Appendix 3A. Cancer incidence, Western Australia, 2004

Summary of most common cancer types 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 + u/k	Total	ASR	95% c.i.	TD%	CumInc	Risk	ASR2
Prostate gland (C610-C619)																									
M							1		7	30	108	215	233	298	236	201	103	69	**1501**	**107.4**	102-113	99.0	14.1	8	164.6 (156-173)
							1.3		9.0	41.3	160.5	356.4	529.4	857.8	873.3	945.2	783.4	862.5							
Breast (C500-C509)																									
M										2	1	1	2	1	1	1			**9**	**0.7**	0.2-1.2	89.0	0.1	1176	0.9 (0.3-1.5)
										2.8	1.5	1.7	4.5	2.9	3.7	4.7									
F						5	19	42	91	148	189	158	123	110	87	63	66	49	**1150**	**82.6**	77.7-87.5	99.0	9.4	11	112.9 (106-119)
						7.6	25.9	57.3	117.3	201.6	282.9	276.6	290.8	314.0	299.2	248.5	343.6	284.8							
Colorectal cancer (C18-C20, C218)																									
M					1			5	13	27	51	67	80	85	90	95	62	36	**612**	**42.3**	38.9-45.8	97.0	5.0	20	68.7 (63.2-74.2)
					1.4			6.8	16.7	37.1	75.8	111.1	181.8	244.7	333.0	446.7	471.6	450.0							
F					4	1	3	5	11	12	40	39	55	59	61	67	64	56	**477**	**29.2**	26.3-32.0	96.0	3.4	30	46.6 (42.4-50.8)
					5.8	1.5	4.1	6.8	14.2	16.3	59.9	68.3	130.0	168.4	209.8	264.3	333.2	325.4							
Skin (melanoma only) (C440-C449; M-8720 - 8774)																									
M				2	6	10	22	26	25	39	56	60	70	62	50	59	37	25	**549**	**40.4**	37.0-43.9	100.0	4.4	23	59.3 (54.3-64.3)
				2.7	8.3	14.8	29.5	35.6	32.2	53.6	83.2	99.4	159.1	178.5	185.0	277.5	281.4	312.5							
F				2	7	10	27	22	20	45	47	48	38	33	24	35	19	21	**398**	**29.0**	26.0-31.9	99.0	3.0	34	39.3 (35.4-43.1)
				2.8	10.2	15.2	36.8	30.0	25.8	61.3	70.3	84.0	89.8	94.2	82.5	138.0	98.9	122.0							
Lung, bronchus & trachea (C330-C349)																									
M					1			1	2	14	15	40	55	73	100	102	77	41	**521**	**34.3**	31.2-37.3	88.0	4.1	25	61.3 (56.0-66.7)
					1.4			1.4	2.6	19.3	22.3	66.3	125.0	210.1	370.1	479.7	585.6	512.5							
F							1	1	4	15	14	28	29	50	53	55	36	22	**308**	**19.1**	16.8-21.4	87.0	2.5	41	30.6 (27.2-34.1)
							1.4	1.4	5.2	20.4	21.0	49.0	68.6	142.7	182.2	216.9	187.4	127.9							
Lymphomas (all)																									
M			2	2	3	4	6	6	11	15	10	20	14	26	28	24	25	10	**206**	**14.7**	12.6-16.8	98.0	1.6	62	22.9 (19.7-26.1)
			2.8	2.7	4.1	5.9	8.1	8.2	14.2	20.6	14.9	33.1	31.8	74.8	103.6	112.9	190.1	125.0							
F			1	4	6	4	4	8	10	10	15	15	19	17	28	14	17	20	**192**	**13.3**	11.3-15.3	98.0	1.5	66	18.9 (16.2-21.6)
			1.5	5.7	8.7	6.1	5.5	10.9	12.9	13.6	22.5	26.3	44.9	48.5	96.3	55.2	88.5	116.2							
Unknown primary site (C26, C39, C76, C80; Behaviour 6/9)																									
M					1	1		2	1	5	8	12	14	19	19	26	26	21	**155**	**10.1**	8.5-11.8	74.0	1.0	99	18.6 (15.6-21.6)
					1.4	1.5		2.7	1.3	6.9	11.9	19.9	31.8	54.7	70.3	122.3	197.7	262.5							
F						1	1	1	5	2	2	8	11	10	12	18	20	25	**116**	**6.2**	5.0-7.5	69.0	0.6	159	11.0 (9.0-13.1)
						1.5	1.4	1.4	6.4	2.7	3.0	14.0	26.0	28.5	41.3	71.0	104.1	145.3							
All cancers																									
M	17	4	8	19	36	42	61	82	124	211	378	566	658	760	737	723	476	283	**5185**	**370.1**	360-380	95.0	43.7	3	577.0 (561-593)
	26.7	5.8	11.1	25.6	49.8	62.1	81.9	112.2	159.7	290.2	561.8	938.1	1495.2	2187.7	2727.3	3400.0	3620.3	3537.5							
F	13	4	9	12	26	45	83	131	198	314	416	439	411	422	417	407	379	333	**4059**	**274.0**	265-283	94.0	30.7	4	398.3 (386-411)
	21.3	6.2	13.1	17.0	37.8	68.6	113.2	178.7	255.2	427.6	622.6	768.4	971.7	1204.6	1433.9	1605.3	1973.3	1935.3							

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Lip (C000-C009)																									
M																1			**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.4)
																4.7									
F																			**0**					-	
Tongue (C010-C029)																									
M										2	1	7	2	2	1			1	**16**	**1.2**	0.6-1.8	222	0.1	671	1.6 (0.8-2.4)
										2.8	1.5	11.6	4.5	5.8	3.7			12.5							
F									1						1	2		3	**7**	**0.3**	0.1-0.6	33	0.0	4231	0.7 (0.2-1.2)
									1.3						3.4	7.9		17.4							
Gum (C030-C039)																									
M										1			1			1	1		**4**	**0.3**	0 - 0.5	37	0.0	5484	0.4 (0.0-0.9)
										1.4			2.3			4.7	7.6								
F																	1		**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.3)
																	5.2								
Floor of mouth (C040-C049)																									
M														1	2	1	1		**5**	**0.3**	0.0-0.6	12	0.1	1946	0.6 (0.1-1.1)
														2.9	7.4	4.7	7.6								
F														1		1			**2**	**0.1**	0 - 0.3	7	0.0	7007	0.2 (0 - 0.5)
														2.9		3.9									
Palate, other & u/s parts of mouth (C050-C069)																									
M														2		1		1	**4**	**0.3**	0 - 0.6	14	0.0	3474	0.5 (0 - 1.0)
														5.8		4.7		12.5							
F													1				2		**3**	**0.1**	0 - 0.3	12	0.0	8460	0.3 (0 - 0.6)
													2.4				10.4								
Parotid & other major salivary gland (C070-C089)																									
M												1				1		1	**3**	**0.2**	0 - 0.4	16	0.0	*	0.4 (0 - 0.8)
												1.7				4.7		12.5							
F																1	1	1	**3**	**0.1**	0 - 0.2	0	0.0	*	0.3 (0 - 0.6)
																3.9	5.2	5.8							
Tonsil & oropharynx (C090-C109)																									
M												1	2	1	3	1			**8**	**0.6**	0.2-1.0	53	0.1	991	0.9 (0.3-1.5)
												1.7	4.5	2.9	11.1	4.7									
F											1								**1**	**0.1**	0 - 0.2	21	0.0	*	0.1 (0 - 0.3)
											1.5														
Nasopharynx (C110-C119)																									
M											1				1				**2**	**0.1**	0 - 0.4	23	0.0	3856	0.2 (0 - 0.5)
											1.5				3.7										
F																			**0**					-	
Pyriform sinus & hypopharynx (C120-C139)																									
M										1		1	1	1	1	1	4		**10**	**0.6**	0.2-1.0	62	0.1	1683	1.1 (0.4-1.9)
										1.4		1.7	2.3	2.9	3.7	4.7	30.4								
F																1			**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.3)
																3.9									

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Pharynx, other & ill-def. sites (C140-C149)																									
M												1		1					**2**	**0.2**	0 - 0.4	23	0.0	4410	0.2 (0 - 0.4)
												1.7		2.9											
F																			**0**					-	
Oesophagus (C150-C159)																									
M							1		1	3	6	9	12	4	5	8	9	6	**64**	**4.3**	3.2-5.4	590	0.4	228	7.2 (5.4-9.0)
							1.3		1.3	4.1	8.9	14.9	27.3	11.5	18.5	37.6	68.5	75.0							
F											2	2	3	2	4	2	5	4	**24**	**1.3**	0.8-1.9	135	0.2	606	2.3 (1.4-3.2)
											3.0	3.5	7.1	5.7	13.8	7.9	26.0	23.2							
Stomach (C160-C169)																									
M								1	1	2		4	15	8	13	13	11	7	**75**	**5.1**	3.9-6.3	437	0.6	171	8.8 (6.8-10.9)
								1.4	1.3	2.8		6.6	34.1	23.0	48.1	61.1	83.7	87.5							
F							1	1		1	2	1	2	4		7	7	9	**35**	**1.7**	1.1-2.4	213	0.1	801	3.3 (2.2-4.4)
							1.4	1.4		1.4	3.0	1.8	4.7	11.4		27.6	36.4	52.3							
Small intestine (C170-C179)																									
M										1		1		3	1		2		**8**	**0.6**	0.2-1.0	64	0.1	1302	0.9 (0.3-1.5)
										1.4		1.7		8.6	3.7		15.2								
F													1	1	1	1		1	**5**	**0.3**	0.0-0.6	21	0.0	2311	0.5 (0.1-0.9)
													2.4	2.9	3.4	3.9		5.8							
Colorectal cancer (C18-C20, C218)																									
M							3	1	2	3	13	13	31	30	29	29	32	22	**208**	**14.1**	12.1-16.0	1400	1.6	64	24.4 (21.0-27.8)
							4.0	1.4	2.6	4.1	19.3	21.5	70.4	86.4	107.3	136.4	243.4	275.0							
F								4	3	7	7	10	10	19	14	32	27	42	**175**	**9.1**	7.6-10.6	1020	0.9	116	16.6 (14.1-19.1)
								5.5	3.9	9.5	10.5	17.5	23.6	54.2	48.1	126.2	140.6	244.1							
Colon (C180-C189)																									
M							1	1		2	8	3	17	23	18	23	18	15	**129**	**8.7**	7.1-10.2	735	1.0	104	15.4 (12.7-18.1)
							1.3	1.4		2.8	11.9	5.0	38.6	66.2	66.6	108.2	136.9	187.5							
F								2	1	5	5	8	8	12	11	22	20	32	**126**	**6.4**	5.2-7.7	678	0.6	163	11.9 (9.8-14.0)
								2.7	1.3	6.8	7.5	14.0	18.9	34.3	37.8	86.8	104.1	186.0							
Rectosigmoid junction & rectum (C190-C209)																									
M							2		2	1	5	10	14	7	11	6	14	7	**79**	**5.4**	4.1-6.6	662	0.6	163	9.0 (7.0-11.0)
							2.7		2.6	1.4	7.4	16.6	31.8	20.2	40.7	28.2	106.5	87.5							
F								2	2	2	2	2	2	7	3	10	7	10	**49**	**2.6**	1.8-3.4	341	0.2	404	4.7 (3.4-6.0)
								2.7	2.6	2.7	3.0	3.5	4.7	20.0	10.3	39.4	36.4	58.1							
Anus (C210-C219)																									
M										2	1						1		**4**	**0.3**	0 - 0.6	71	0.0	4721	0.4 (0.0-0.8)
										2.8	1.5						7.6								
F														1			1		**2**	**0.1**	0 - 0.3	7	0.0	7007	0.2 (0 - 0.5)
														2.9			5.2								
Liver & intrahepatic bile ducts (C220-C229)																									
M			1		1				1	3	2	4	7	6	5	8	7	1	**46**	**3.2**	2.2-4.2	452	0.3	288	5.1 (3.6-6.6)
			1.4		1.4				1.3	4.1	3.0	6.6	15.9	17.3	18.5	37.6	53.2	12.5							
F										1	2				3	7	2	2	**17**	**0.8**	0.4-1.2	76	0.1	1364	1.7 (0.9-2.5)
										1.4	3.0				10.3	27.6	10.4	11.6							

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Gallbladder & bile ducts (C230-C249)																									
M										1	1		1	2	3	5	3	3	**19**	**1.2**	0.6-1.7	78	0.1	910	2.4 (1.3-3.5)
										1.4	1.5		2.3	5.8	11.1	23.5	22.8	37.5							
F											1	2	2	2	2	3	3	7	**22**	**1.1**	0.6-1.6	97	0.1	897	2.0 (1.2-2.9)
											1.5	3.5	4.7	5.7	6.9	11.8	15.6	40.7							
Pancreas (C250-C259)																									
M									2	3	3	7	10	8	13	20	7	7	**80**	**5.3**	4.1-6.5	510	0.6	172	9.4 (7.3-11.4)
									2.6	4.1	4.5	11.6	22.7	23.0	48.1	94.1	53.2	87.5							
F									1	1	2	6	5	10	14	16	13	13	**81**	**4.4**	3.3-5.4	363	0.5	192	7.9 (6.2-9.6)
									1.3	1.4	3.0	10.5	11.8	28.5	48.1	63.1	67.7	75.6							
Nasal cavity & sinuses, middle & inner ear (C300-C319)																									
M								1	1			1		1			2	2	**8**	**0.5**	0.1-0.9	88	0.0	2781	1.0 (0.3-1.7)
								1.4	1.3			1.7		2.9			15.2	25.0							
F													1					1	**2**	**0.1**	0 - 0.3	12	0.0	8460	0.2 (0 - 0.4)
													2.4					5.8							
Larynx (C320-C329)																									
M											2		1	2	4	5	4		**18**	**1.1**	0.6-1.6	76	0.1	776	2.1 (1.1-3.1)
											3.0		2.3	5.8	14.8	23.5	30.4								
F														1				2	**3**	**0.1**	0 - 0.3	7	0.0	7007	0.3 (0 - 0.6)
														2.9				11.6							
Lung, bronchus & trachea (C330-C349)																									
M								1	1	9	18	38	40	50	89	86	72	34	**438**	**28.2**	25.5-30.9	2301	3.3	30	51.8 (46.9-56.7)
								1.4	1.3	12.4	26.8	63.0	90.9	143.9	329.3	404.4	547.6	425.0							
F								1	3	5	16	21	27	30	38	44	43	22	**250**	**14.6**	12.7-16.6	1575	1.8	57	24.6 (21.5-27.7)
								1.4	3.9	6.8	23.9	36.8	63.8	85.6	130.7	173.5	223.9	127.9							
Thymus (C370-C379)																									
M							1												**1**	**0.1**	0 - 0.2	40	0.0	*	0.1 (0 - 0.3)
							1.3																		
F																			**0**					-	
Pleura, heart & mediastinum (C380-C389)																									
M																			**0**					-	
F																			**0**					-	
Bones, joints & articular cartilages (C400-C419)																									
M				1			1			1	1		1						**5**	**0.4**	0.0-0.9	150	0.0	2556	0.5 (0.1-0.9)
				1.3			1.3			1.4	1.5		2.3												
F									1										**1**	**0.1**	0 - 0.2	31	0.0	*	0.1 (0 - 0.3)
									1.3																
Skin (melanoma only) (C430-C439)																									
M					4	1	2	1	2	6	8	7	8	4	6	12	10	13	**84**	**5.8**	4.5-7.1	977	0.5	206	9.9 (7.7-12.1)
					5.5	1.5	2.7	1.4	2.6	8.3	11.9	11.6	18.2	11.5	22.2	56.4	76.1	162.5							
F						1		2		5	3	3	5	1	6	3	3	4	**36**	**2.4**	1.6-3.3	441	0.3	357	3.5 (2.4-4.7)
						1.5		2.7		6.8	4.5	5.3	11.8	2.9	20.6	11.8	15.6	23.2							

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Skin (not melanoma; inc. SCC-BCC) (C440-C449)																									
M									1			2	3	1	4	2	4	6	**23**	**1.5**	0.9-2.1	113	0.1	688	2.9 (1.7-4.2)
									1.3			3.3	6.8	2.9	14.8	9.4	30.4	75.0							
F											1			1		2	2	7	**13**	**0.5**	0.2-0.8	28	0.0	4597	1.1 (0.5-1.8)
											1.5			2.9		7.9	10.4	40.7							
Mesothelioma (M905; ICD10 C45)																									
M									1	2	2	5	7	4	14	10	6	3	**54**	**3.6**	2.6-4.6	343	0.5	212	6.2 (4.6-7.9)
									1.3	2.8	3.0	8.3	15.9	11.5	51.8	47.0	45.6	37.5							
F												1	1	1		3		2	**8**	**0.4**	0.1-0.8	35	0.0	2870	0.8 (0.2-1.3)
												1.8	2.4	2.9		11.8		11.6							
Kaposi sarcoma (M914; ICD10 C46)																									
M																			**0**					-	
F																			**0**					-	
Nervous system, peripheral & autonomic (C470-C479)																									
M			1																**1**	**0.1**	0 - 0.4	59	0.0	*	0.1 (0 - 0.3)
			1.4																						
F																	1		**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.3)
																	5.2								
Retroperitoneum and peritoneum (C480-C489)																									
M																1			**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.4)
																4.7									
F										1		1				1	1	1	**5**	**0.2**	0.0-0.5	43	0.0	6427	0.5 (0.1-0.9)
										1.4		1.8				3.9	5.2	5.8							
Connective, subcutaneous & other soft tissues (C490-C499)																									
M			1			1				1				1	3	2	2		**11**	**0.8**	0.3-1.3	142	0.1	1098	1.3 (0.5-2.0)
			1.4			1.5				1.4				2.9	11.1	9.4	15.2								
F					1					1		1	1		1				**5**	**0.4**	0.0-0.8	107	0.1	1930	0.5 (0.1-0.9)
					1.5					1.4		1.8	2.4		3.4										
Breast (C500-C509)																									
M							1												**1**	**0.1**	0 - 0.2	40	0.0	*	0.1 (0 - 0.3)
							1.3																		
F							2	4	10	16	23	19	23	28	23	24	31	20	**223**	**14.1**	12.1-16.1	2286	1.6	62	21.7 (18.9-24.6)
							2.7	5.5	12.9	21.8	34.4	33.3	54.4	79.9	79.1	94.7	161.4	116.2							
Vulva/vagina (C510-C529)																									
F												2		1		1	1	4	**9**	**0.4**	0.1-0.7	40	0.0	3148	0.8 (0.3-1.3)
												3.5		2.9		3.9	5.2	23.2							
Cervix uteri (C530-C539)																									
F				1				1	1	1	3	3	1	1	1	1	3	5	**22**	**1.3**	0.7-1.9	282	0.1	840	2.1 (1.2-2.9)
				1.4				1.4	1.3	1.4	4.5	5.3	2.4	2.9	3.4	3.9	15.6	29.1							
Corpus uteri (C540-C549)																									
F										2		1	1	5	3	5	5	9	**31**	**1.6**	0.9-2.2	123	0.2	637	2.9 (1.9-3.9)
										2.7		1.8	2.4	14.3	10.3	19.7	26.0	52.3							
Uterus, NOS (C550-C559)																									
F																		1	**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.2)
																		5.8							

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Ovary, uterine adnexa & other female genital (C560-C579)																									
F						1	3		2	3	2	6	10	18	8	13	17	6	**89**	**5.5**	4.3-6.7	715	0.6	156	8.7 (6.9-10.5)
						1.5	4.1		2.6	4.1	3.0	10.5	23.6	51.4	27.5	51.3	88.5	34.9							
Placenta (C580-C589)																									
F																			**0**					-	
Penis & other male genital organs (C600-C639) (not C61 C62)																									
M														1					**1**	**0.1**	0 - 0.3	7	0.0	6948	0.1 (0 - 0.3)
														2.9											
Prostate gland (C610-C619)																									
M											3	4	14	18	21	51	45	50	**206**	**12.1**	10.4-13.8	461	0.9	116	27.1 (23.4-30.9)
											4.5	6.6	31.8	51.8	77.7	239.8	342.3	625.0							
Testis (C620-C629)																									
M						1					1				1				**3**	**0.3**	0 - 0.6	67	0.0	3001	0.3 (0 - 0.7)
						1.5					1.5				3.7										
Kidney & other renal tract (C640-C689) (not C67)																									
M							1		1	4	1	5	10	5	7	4	5	5	**48**	**3.4**	2.4-4.4	437	0.4	248	5.4 (3.9-7.0)
							1.3		1.3	5.5	1.5	8.3	22.7	14.4	25.9	18.8	38.0	62.5							
F								1	2		1	2	3	5	4	4	10	3	**35**	**1.9**	1.2-2.7	232	0.2	454	3.4 (2.3-4.5)
								1.4	2.6		1.5	3.5	7.1	14.3	13.8	15.8	52.1	17.4							
Urinary bladder (C670-C679)																									
M								1			2	1	4	4	9	10	10	16	**57**	**3.5**	2.6-4.5	187	0.3	334	7.6 (5.6-9.6)
								1.4			3.0	1.7	9.1	11.5	33.3	47.0	76.1	200.0							
F											1			1	3	6	1	6	**18**	**0.8**	0.4-1.2	36	0.1	1364	1.7 (0.9-2.5)
											1.5			2.9	10.3	23.7	5.2	34.9							
Eye & lacrimal gland (C690-C699)																									
M	1																1		**2**	**0.2**	0 - 0.6	71	0.0	*	0.2 (0 - 0.6)
	1.6																7.6								
F												1	1	3					**5**	**0.4**	0.1-0.8	50	0.1	1578	0.5 (0.1-0.9)
												1.8	2.4	8.6											
Meninges (cerebral & spinal) (C700-C709)																									
M																			**0**					-	
F																		1	**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.2)
																		5.8							
Brain (C710-C719)																									
M	1	1					1	1	5	4	5	4	3	4	7	8	3	1	**48**	**3.5**	2.5-4.6	705	0.4	264	5.2 (3.7-6.7)
	1.6	1.5					1.3	1.4	6.4	5.5	7.4	6.6	6.8	11.5	25.9	37.6	22.8	12.5							
F			2	1		2	1	2	2	7	3	11	5	5	8	5	2	4	**60**	**4.4**	3.2-5.6	983	0.5	199	5.9 (4.4-7.4)
			2.9	1.4		3.0	1.4	2.7	2.6	9.5	4.5	19.3	11.8	14.3	27.5	19.7	10.4	23.2							
Spinal cord & cranial nerves (C720-C729)																									
M														1		1			**2**	**0.1**	0 - 0.3	7	0.0	6948	0.2 (0 - 0.5)
														2.9		4.7									
F																			**0**					-	

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Thyroid gland (C730-C739)																									
M						1							1	1	1	1			**5**	**0.4**	0.0-0.8	65	0.1	1936	0.6 (0.1-1.0)
						1.5							2.3	2.9	3.7	4.7									
F													1		1	1			**3**	**0.2**	0 - 0.4	14	0.0	3447	0.3 (0 - 0.7)
													2.4		3.4	3.9									
Adrenal & other endocrine glands (C740-C759)																									
M		1			1									1					**3**	**0.3**	0 - 0.7	120	0.0	3498	0.3 (0 - 0.6)
		1.5			1.4									2.9											
F	1	1						1											**3**	**0.4**	0 - 0.9	174	0.0	4405	0.3 (0 - 0.7)
	1.6	1.5						1.4																	
LYMPHOMAS																									
Lymphoma, NOS / unclassifiable																									
M																	1	1	**2**	**0.1**	0 - 0.2	0	0.0	*	0.3 (0 - 0.7)
																	7.6	12.5							
F											1		1	1		1			**4**	**0.3**	0 - 0.6	40	0.0	2979	0.4 (0.0-0.8)
											1.5		2.4	2.9		3.9									
Hodgkin lymphoma																									
M							2		1				1		5	2			**11**	**0.8**	0.3-1.3	132	0.1	809	1.3 (0.5-2.0)
							2.7		1.3				2.3		18.5	9.4									
F															1				**1**	**0.1**	0 - 0.2	2	0.0	5817	0.1 (0 - 0.3)
															3.4										
All NHL																									
M				2	1			1	3	1	2	3	4	8	11	11	14	8	**69**	**4.5**	3.4-5.6	523	0.5	219	8.3 (6.3-10.3)
				2.7	1.4			1.4	3.9	1.4	3.0	5.0	9.1	23.0	40.7	51.7	106.5	100.0							
F							1		3	2	4	2	1	7	8	7	5	12	**52**	**2.9**	2.1-3.8	384	0.3	298	5.0 (3.6-6.4)
							1.4		3.9	2.7	6.0	3.5	2.4	20.0	27.5	27.6	26.0	69.7							
NHL, mature B cell																									
M				1	1			1	2		2	3	2	5	9	9	12	7	**54**	**3.4**	2.5-4.4	366	0.3	300	6.6 (4.8-8.4)
				1.3	1.4			1.4	2.6		3.0	5.0	4.5	14.4	33.3	42.3	91.3	87.5							
F							1		3	2	3	2		5	5	5	3	9	**38**	**2.2**	1.4-2.9	330	0.2	422	3.6 (2.5-4.8)
							1.4		3.9	2.7	4.5	3.5		14.3	17.2	19.7	15.6	52.3							
NHL, mature T/NK cell																									
M										1						1			**2**	**0.1**	0 - 0.3	25	0.0	*	0.2 (0 - 0.5)
										1.4						4.7									
F														1	1		1		**3**	**0.2**	0 - 0.4	10	0.0	3179	0.3 (0 - 0.6)
														2.9	3.4		5.2								
NHL, precursor cell lymphoblastic																									
M				1															**1**	**0.1**	0 - 0.4	54	0.0	*	0.1 (0 - 0.3)
				1.3																					
F																			**0**					-	
NHL, other/unclassifiable																									
M									1				2	3	2	1	2	1	**12**	**0.9**	0.4-1.4	78	0.1	915	1.4 (0.6-2.2)
									1.3				4.5	8.6	7.4	4.7	15.2	12.5							
F											1		1	1	2	2	1	3	**11**	**0.6**	0.2-1.0	45	0.1	1472	1.1 (0.4-1.7)
											1.5		2.4	2.9	6.9	7.9	5.2	17.4							

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Lymphomas (all)																									
M				2	1		2	1	4	1	2	3	5	8	16	13	15	9	**82**	**5.4**	4.2-6.6	656	0.6	173	9.9 (7.7-12.1)
				2.7	1.4		2.7	1.4	5.2	1.4	3.0	5.0	11.4	23.0	59.2	61.1	114.1	112.5							
F							1		3	2	5	2	2	8	9	8	5	12	**57**	**3.3**	2.4-4.2	427	0.4	259	5.5 (4.1-7.0)
							1.4		3.9	2.7	7.5	3.5	4.7	22.8	30.9	31.6	26.0	69.7							
MYELOMA																									
Myeloma/plasma cell tumours																									
M											1	4		4	9	4	5	1	**28**	**1.8**	1.1-2.5	134	0.3	378	3.3 (2.0-4.5)
											1.5	6.6		11.5	33.3	18.8	38.0	12.5							
F											3		2	5	4	7	8	5	**34**	**1.7**	1.1-2.4	133	0.2	537	3.3 (2.2-4.4)
											4.5		4.7	14.3	13.8	27.6	41.7	29.1							
LEUKAEMIAS																									
Leukaemias, NOS/unclassifiable																									
M																1			**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.4)
																4.7									
F														2		1		1	**4**	**0.2**	0 - 0.5	14	0.0	3504	0.4 (0.0-0.8)
														5.7		3.9		5.8							
Leukaemias, lymphoid, all																									
M	1	1				1	1						2	3	3	2	5	1	**20**	**1.5**	0.8-2.3	269	0.2	664	2.3 (1.3-3.4)
	1.6	1.5				1.5	1.3						4.5	8.6	11.1	9.4	38.0	12.5							
F			1					1				1			3	5	3	1	**15**	**0.8**	0.3-1.2	120	0.1	1344	1.5 (0.7-2.3)
			1.5					1.4				1.8			10.3	19.7	15.6	5.8							
Leukaemias, lymphoid, acute																									
M	1	1					1											1	**4**	**0.5**	0 - 1.0	174	0.0	4578	0.5 (0 - 1.0)
	1.6	1.5					1.3											12.5							
F			1					1				1				2	1		**6**	**0.4**	0.0-0.7	112	0.0	4381	0.6 (0.1-1.1)
			1.5					1.4				1.8				7.9	5.2								
Leukaemias, lymphoid, chronic																									
M													1	3	3	2	5		**14**	**0.9**	0.4-1.3	39	0.1	909	1.7 (0.8-2.5)
													2.3	8.6	11.1	9.4	38.0								
F															3	3	2	1	**9**	**0.4**	0.1-0.7	7	0.1	1939	0.9 (0.3-1.5)
															10.3	11.8	10.4	5.8							
Leukaemias, lymphoid, other/NOS																									
M						1							1						**2**	**0.2**	0 - 0.5	56	0.0	5331	0.2 (0 - 0.5)
						1.5							2.3												
F																			**0**					-	
Leukaemias, myeloid, all																									
M			1	1	1			1		1	2	1	2	2	5	5		4	**26**	**1.9**	1.2-2.7	327	0.2	497	3.1 (1.9-4.3)
			1.4	1.3	1.4			1.4		1.4	3.0	1.7	4.5	5.8	18.5	23.5		50.0							
F				1				1		1	1	2	2	5	2	6	4	6	**31**	**1.8**	1.1-2.5	235	0.2	572	3.0 (1.9-4.0)
				1.4				1.4		1.4	1.5	3.5	4.7	14.3	6.9	23.7	20.8	34.9							
Leukaemias, myeloid, acute																									
M			1		1						2	1	2	2	5	4		4	**22**	**1.6**	0.9-2.3	214	0.2	553	2.7 (1.5-3.8)
			1.4		1.4						3.0	1.7	4.5	5.8	18.5	18.8		50.0							
F				1				1		1	1	1	2	3	1	6	3	5	**25**	**1.4**	0.8-2.0	202	0.1	830	2.4 (1.5-3.3)
				1.4				1.4		1.4	1.5	1.8	4.7	8.6	3.4	23.7	15.6	29.1							

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Leukaemias, myeloid, chronic																									
M				1				1		1						1			**4**	**0.3**	0 - 0.7	114	0.0	4887	0.4 (0.0-0.8)
				1.3				1.4		1.4						4.7									
F												1		2			1	1	**5**	**0.3**	0.0-0.6	31	0.0	2682	0.5 (0.1-0.9)
												1.8		5.7			5.2	5.8							
Leukaemias, myeloid, other/NOS																									
M																			**0**					-	
F															1				**1**	**0.1**	0 - 0.2	2	0.0	5817	0.1 (0 - 0.3)
															3.4										
Leukaemias, other																									
M														1		2	3	1	**7**	**0.4**	0.1-0.6	7	0.0	6948	0.9 (0.2-1.6)
														2.9		9.4	22.8	12.5							
F																	1		**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.3)
																	5.2								
Leukaemias (all)																									
M	1	1	1	1	1	1	1	1		1	2	1	4	6	8	10	8	6	**54**	**3.9**	2.8-5.0	604	0.4	273	6.5 (4.7-8.2)
	1.6	1.5	1.4	1.3	1.4	1.5	1.3	1.4		1.4	3.0	1.7	9.1	17.3	29.6	47.0	60.8	75.0							
F			1	1				2		1	1	3	2	7	5	12	8	8	**51**	**2.8**	2.0-3.7	369	0.3	360	5.0 (3.6-6.3)
			1.5	1.4				2.7		1.4	1.5	5.3	4.7	20.0	17.2	47.3	41.7	46.5							
MYELODYSPLASTIC DISEASES																									
Refractory anaemias/cytopaenias																									
M														2	1	4	3	1	**11**	**0.6**	0.2-1.0	16	0.0	2115	1.4 (0.6-2.2)
														5.8	3.7	18.8	22.8	12.5							
F												1	1	1	1		3	2	**9**	**0.5**	0.1-0.8	38	0.1	1922	0.8 (0.3-1.4)
												1.8	2.4	2.9	3.4		15.6	11.6							
Myelodysplastic syndromes																									
M													1	1	1	4	7	4	**18**	**1.0**	0.5-1.4	21	0.0	2260	2.4 (1.3-3.5)
													2.3	2.9	3.7	18.8	53.2	50.0							
F															2	2		7	**11**	**0.4**	0.2-0.7	5	0.0	2909	1.0 (0.4-1.6)
															6.9	7.9		40.7							
Myelodysplastic diseases, all																									
M													1	3	2	8	10	5	**29**	**1.6**	1.0-2.2	37	0.1	1093	3.8 (2.4-5.2)
													2.3	8.6	7.4	37.6	76.1	62.5							
F												1	1	1	3	2	3	9	**20**	**0.9**	0.4-1.3	43	0.1	1158	1.8 (1.0-2.6)
												1.8	2.4	2.9	10.3	7.9	15.6	52.3							
CHRONIC MYELOPROLIFERATIVE DISEASES																									
Chronic myeloproliferative disorder, NOS																									
M															1		1		**2**	**0.1**	0 - 0.3	2	0.0	5405	0.3 (0 - 0.6)
															3.7		7.6								
F															1	1	1	1	**4**	**0.2**	0 - 0.3	2	0.0	5817	0.4 (0.0-0.8)
															3.4	3.9	5.2	5.8							
Polycythaemia rubra vera																									
M															1				**1**	**0.1**	0 - 0.2	2	0.0	5405	0.1 (0 - 0.4)
															3.7										
F																		1	**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.2)
																		5.8							

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Myelofibrosis/sclerosis																									
M														1		1	2	1	**5**	**0.3**	0.0-0.5	7	0.0	6948	0.7 (0.1-1.2)
														2.9		4.7	15.2	12.5							
F												1		1	1	1	2		**6**	**0.3**	0.0-0.6	26	0.0	2487	0.6 (0.1-1.1)
												1.8		2.9	3.4	3.9	10.4								
Other chronic myeloproliferative d/o																									
M																			**0**					-	
F																			**0**					-	
Chronic myeloproliferative d/o, all																									
M														1	2	1	3	1	**8**	**0.5**	0.1-0.8	12	0.1	1946	1.0 (0.3-1.7)
														2.9	7.4	4.7	22.8	12.5							
F												1		1	2	2	3	2	**11**	**0.5**	0.2-0.8	28	0.1	1742	1.1 (0.4-1.7)
												1.8		2.9	6.9	7.9	15.6	11.6							
OTHER CHRONIC IMMUNOPROLIFERATIVE DISEASES																									
Mast cell tumours																									
M																			**0**					-	
F																			**0**					-	
Histiocytic/dendritic cell malignancies																									
M																			**0**					-	
F																			**0**					-	
Other & U/S immunoproliferative neoplasms																									
M																			**0**					-	
F														1		1			**2**	**0.1**	0 - 0.3	7	0.0	7007	0.2 (0 - 0.5)
														2.9		3.9									
Other chronic immunoproliferative d/o, all																									
M																			**0**					-	
F														1		1			**2**	**0.1**	0 - 0.3	7	0.0	7007	0.2 (0 - 0.5)
														2.9		3.9									
Unknown primary site (C80 or Behaviour 6/9)																									
M										5	4	6	4	11	10	16	14	17	**87**	**5.5**	4.3-6.7	450	0.5	199	10.8 (8.5-13.2)
										6.9	5.9	9.9	9.1	31.7	37.0	75.2	106.5	212.5							
F				1		1			2	2	1	3	6	7	10	17	18	27	**95**	**4.6**	3.6-5.7	430	0.4	240	8.9 (7.1-10.7)
				1.4		1.5			2.6	2.7	1.5	5.3	14.2	20.0	34.4	67.1	93.7	156.9							
Total deaths due to cancer																									
M	3	3	4	4	8	5	14	9	23	56	80	130	187	196	286	326	285	212	**1831**	**120.8**	115-127	12708	12.8	8	218.5 (208-229)
	4.7	4.4	5.5	5.4	11.1	7.4	18.8	12.3	29.6	77.0	118.9	215.5	424.9	564.2	1058.4	1533.0	2167.6	2650.0							
F	1	1	3	4	1	5	8	19	31	56	80	101	116	169	163	231	221	232	**1442**	**82.5**	77.8-87.1	10813	8.9	12	139.3 (132-147)
	1.6	1.5	4.4	5.7	1.5	7.6	10.9	25.9	40.0	76.3	119.7	176.8	274.2	482.4	560.5	911.1	1150.7	1348.3							

Appendix 3B. Cancer mortality, Western Australia, 2004

Age	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	**Total**	**ASR**	95% c.i.	PYLL	CumInc	Risk	ASR2
Deaths due to benign tumours in CR cases																									
M																			**0**					-	
F																			**0**					-	
Deaths due to lymphohaematopoietic tumours of uncertain malignant potential																									
M																			**0**					-	
F																	1		**1**	**0.0**	0 - 0.1	0	0.0	*	0.1 (0 - 0.3)
																	5.2								
Deaths due to non-lymphohaematopoietic tumours of uncertain/unspecified nature																									
M																			**0**					-	
F																			**0**					-	
Non-cancer deaths in CR cases																									
M			1						5	7	10	8	21	41	82	140	186	262	**763**	**43.9**	40.7-47.1	1444	2.6	39	105.5 (98.0-113)
			1.4						6.4	9.6	14.9	13.3	47.7	118.0	303.4	658.4	1414.7	3275.0							
F	1	1		1		1	1	1	2	5	6	13	15	19	30	69	118	263	**546**	**21.2**	19.2-23.3	1236	1.2	83	48.5 (44.4-52.6)
	1.6	1.5		1.4		1.5	1.4	1.4	2.6	6.8	9.0	22.8	35.5	54.2	103.2	272.1	614.4	1528.4							
Deaths of undetermined cause in CR cases																									
M									1	2	1		2	3	2	2	3	3	**19**	**1.3**	0.7-1.9	149	0.1	767	2.3 (1.2-3.3)
									1.3	2.8	1.5		4.5	8.6	7.4	9.4	22.8	37.5							
F							1		2	2			1				2	3	**11**	**0.6**	0.2-1.0	166	0.0	2215	1.0 (0.4-1.6)
							1.4		2.6	2.7			2.4				10.4	17.4							
Total deaths of Cancer Registry cases																									
M	3	3	5	4	8	5	14	9	29	65	91	138	210	244	374	477	487	482	**2648**	**167.9**	161-174	14468	15.6	7	330.9 (318-344)
	4.7	4.4	6.9	5.4	11.1	7.4	18.8	12.3	37.4	89.4	135.3	228.7	477.2	702.4	1384.0	2243.1	3704.0	6025.0							
F	3	2	3	5	1	6	10	20	35	63	86	116	133	190	199	304	350	507	**2033**	**106.0**	101-111	12434	10.4	10	192.0 (184-200)
	4.9	3.1	4.4	7.1	1.5	9.1	13.6	27.3	45.1	85.8	128.7	203.0	314.4	542.3	684.3	1199.0	1822.3	2946.5							

Appendix 3C.Childhood cancer, Western Australia, 2004 (WHO International Classification, version 3)

	Males								Females								All							
	Age Group								Age Group								Age Group							
	0	1-4	5-9	10-14	Total	ASR	95%c.i.	TD%	0	1-4	5-9	10-14	Total	ASR	95%c.i.	TD%	0	1-4	5-9	10-14	Total	ASR	95%c.i.	TD%
I. LEUKAEMIAS, MYELOPROLIFERATIVE AND MYELODYSPLASTIC DISEASES																								
All		3	3	3	**9**	**4.4**	1.5-7.4	100	2	2	2	2	**8**	**4.4**	1.3-7.5	100	2	5	5	5	**17**	**4.4**	2.3-6.5	100
		5.8	4.4	4.1					16.7	4.1	3.1	2.9					8.2	5.0	3.7	3.5				
Lymphoid leukaemia		3	3	2	**8**	**4.0**	1.2-6.8	100	1	2	2	2	**7**	**3.7**	0.9-6.6	100	1	5	5	4	**15**	**3.9**	1.9-5.9	100
		5.8	4.4	2.8					8.4	4.1	3.1	2.9					4.1	5.0	3.7	2.8				
Acute myeloid leukaemia				1	**1**	**0.4**	0 - 1.2	100	1				**1**	**0.6**	0 - 1.9	100	1			1	**2**	**0.5**	0 - 1.3	100
				1.4					8.4								4.1			0.7				
Chronic MPDs					**0**								**0**								**0**			
MDS & other MPDs					**0**								**0**								**0**			
Unspecified/other leukaemia					**0**								**0**								**0**			
II. LYMPHOMAS																								
All				2	**2**	**0.8**	0 - 1.9	100				1	**1**	**0.4**	0 - 1.2	100				3	**3**	**0.6**	0 - 1.3	100
				2.8								1.5								2.1				
Hodgkin lymphoma					**0**							1	**1**	**0.4**	0 - 1.2	100				1	**1**	**0.2**	0 - 0.6	100
												1.5								0.7				
Non-Hodgkin lymphoma exc Burkit				1	**1**	**0.4**	0 - 1.2	100					**0**							1	**1**	**0.2**	0 - 0.6	100
				1.4																0.7				
Burkitt lymphoma				1	**1**	**0.4**	0 - 1.2	100					**0**							1	**1**	**0.2**	0 - 0.6	100
				1.4																0.7				
Misc. lymphoreticular neoplasms					**0**								**0**								**0**			
Unspecified lymphoma					**0**								**0**								**0**			
III. CNS AND INTRACRANIAL/SPINAL																								
All	2	3			**5**	**3.1**	0.4-5.7	60		1		3	**4**	**1.9**	0.0-3.8	75	2	4		3	**9**	**2.5**	0.8-4.1	67
	16.2	5.8								2.0		4.4					8.2	4.0		2.1				
Ependymoma/choroid plexus	1				**1**	**0.6**	0 - 1.9	100					**0**				1				**1**	**0.3**	0 - 0.9	100
	8.1																4.1							
Astrocytoma		1			**1**	**0.6**	0 - 1.8	0				2	**2**	**0.8**	0 - 2.0	50		1		2	**3**	**0.7**	0 - 1.5	33
		1.9										2.9						1.0		1.4				
Embryonal tumours	1	1			**2**	**1.2**	0 - 2.9	100		1			**1**	**0.6**	0 - 1.9	100	1	2			**3**	**0.9**	0 - 2.0	100
	8.1	1.9								2.0							4.1	2.0						
Other gliomas		1			**1**	**0.6**	0 - 1.8	0				1	**1**	**0.4**	0 - 1.2	100		1		1	**2**	**0.5**	0 - 1.2	50
		1.9										1.5						1.0		0.7				
Other intracranial/spinal					**0**								**0**								**0**			
Unspecified					**0**								**0**								**0**			

Appendix 3C.Childhood cancer, Western Australia, 2004 (WHO International Classification, version 3)

	Males								Females								All							
	Age Group								Age Group								Age Group							
	0	1-4	5-9	10-14	Total	ASR	95%c.i.	TD%	0	1-4	5-9	10-14	Total	ASR	95%c.i.	TD%	0	1-4	5-9	10-14	Total	ASR	95%c.i.	TD%
IV. NEUROBLASTOMA & PERIPHERAL NERVOUS SYSTEM TUMOURS																								
All		1 1.9			**1**	**0.6**	0 - 1.8	100	1 8.4	3 6.1		1 1.5	**5**	**3.0**	0.3-5.6	100	1 4.1	4 4.0		1 0.7	**6**	**1.8**	0.3-3.2	100
Neuroblastoma/ganglioneurobl.		1 1.9			**1**	**0.6**	0 - 1.8	100	1 8.4	3 6.1			**4**	**2.5**	0.1-5.0	100	1 4.1	4 4.0			**5**	**1.6**	0.2-2.9	100
Other					**0**							1 1.5	**1**	**0.4**	0 - 1.2	100				1 0.7	**1**	**0.2**	0 - 0.6	100
V. RETINOBLASTOMA																								
All	1 8.1	3 5.8			**4**	**2.4**	0.0-4.8	100	1 8.4				**1**	**0.6**	0 - 1.9	100	2 8.2	3 3.0			**5**	**1.6**	0.2-2.9	100
VI. RENAL TUMOURS																								
All		2 3.9	1 1.5		**3**	**1.7**	0 - 3.6	100		1 2.0			**1**	**0.6**	0 - 1.9	100		3 3.0	1 0.7		**4**	**1.2**	0.0-2.3	100
Neuroblastoma/other non-epithel.		2 3.9	1 1.5		**3**	**1.7**	0 - 3.6	100		1 2.0			**1**	**0.6**	0 - 1.9	100		3 3.0	1 0.7		**4**	**1.2**	0.0-2.3	100
Renal carcinoma					**0**								**0**								**0**			
Unspecified					**0**								**0**								**0**			
VII. HEPATIC TUMOURS																								
All		1 1.9			**1**	**0.6**	0 - 1.8	100					**0**					1 1.0			**1**	**0.3**	0 - 0.9	100
Hepatoblastoma		1 1.9			**1**	**0.6**	0 - 1.8	100					**0**					1 1.0			**1**	**0.3**	0 - 0.9	100
Hepatic carcinoma					**0**								**0**								**0**			
Unspecified					**0**								**0**								**0**			
VIII. BONE																								
All				2 2.8	**2**	**0.8**	0 - 1.9	100		1 2.0	1 1.5	1 1.5	**3**	**1.5**	0 - 3.3	100		1 1.0	1 0.7	3 2.1	**5**	**1.2**	0.1-2.2	100
Osteosarcoma				1 1.4	**1**	**0.4**	0 - 1.2	100			1 1.5		**1**	**0.5**	0 - 1.5	100			1 0.7	1 0.7	**2**	**0.4**	0 - 1.1	100
Chondrosarcoma					**0**								**0**								**0**			
Ewing & related sarcoma				1 1.4	**1**	**0.4**	0 - 1.2	100		1 2.0		1 1.5	**2**	**1.1**	0 - 2.5	100		1 1.0		2 1.4	**3**	**0.7**	0 - 1.5	100
Other specified					**0**								**0**								**0**			
Unspecified					**0**								**0**								**0**			

Appendix 3C.Childhood cancer, Western Australia, 2004 (WHO International Classification, version 3)

	Males								Females								All							
	Age Group								Age Group								Age Group							
	0	1-4	5-9	10-14	**Total**	**ASR**	95%c.i.	TD%	0	1-4	5-9	10-14	**Total**	**ASR**	95%c.i.	TD%	0	1-4	5-9	10-14	**Total**	**ASR**	95%c.i.	TD%
IX. SOFT TISSUE SARCOMA																								
All				1 1.4	**1**	**0.4**	0 - 1.2	100				1 1.5	**1**	**0.5**	0 - 1.5	100				1 0.7	1 0.7	**2**	**0.4**	0 - 1.1	100
Rhabdomyosarcoma					**0**							1 1.5	**1**	**0.5**	0 - 1.5	100				1 0.7		**1**	**0.2**	0 - 0.7	100
Fibrosarcoma/Neurofibrosarc.				1 1.4	**1**	**0.4**	0 - 1.2	100					**0**								1 0.7	**1**	**0.2**	0 - 0.6	100
Kaposi sarcoma					**0**								**0**									**0**		
Other specified					**0**								**0**									**0**		
Unspecified					**0**								**0**									**0**		
X. GONADAL AND GERM CELL																								
All	1 8.1				**1**	**0.6**	0 - 1.9	100	1 8.4				**1**	**0.6**	0 - 1.9	0	2 8.2				**2**	**0.6**	0 - 1.5	50
Intracranial/spinal					**0**								**0**									**0**		
Other/unspecified non-gonadal	1 8.1				**1**	**0.6**	0 - 1.9	100	1 8.4				**1**	**0.6**	0 - 1.9	0	2 8.2				**2**	**0.6**	0 - 1.5	50
Gonadal germ cell					**0**								**0**									**0**		
Gonadal carcinoma					**0**								**0**									**0**		
Other and unspecified					**0**								**0**									**0**		
XI. OTHER EPITHELIAL / MELANOMA																								
All			1 1.5		**1**	**0.5**	0 - 1.4	100				1 1.5	**1**	**0.4**	0 - 1.2	100				1 0.7	1 0.7	**2**	**0.4**	0 - 1.1	100
Adrenocortical carcinoma					**0**								**0**									**0**		
Thyroid carcinoma					**0**								**0**									**0**		
Nasopharyngeal carcinoma					**0**								**0**									**0**		
Malignant melanoma					**0**								**0**									**0**		
Skin carcinomas			1.0 1.5		**1**	**0.5**	0 - 1.4	100					**0**						1.0 0.7		**1**	**0.2**	0 - 0.7	100
Other/unspecified carcinoma					**0**							1 1.5	**1**	**0.4**	0 - 1.2	100				1 0.7	**1**	**0.2**	0 - 0.6	100

Appendix 3C.Childhood cancer, Western Australia, 2004 (WHO International Classification, version 3)

	Males								**Females**								**All**							
	Age Group								Age Group								Age Group							
	0	1-4	5-9	10-14	**Total**	**ASR**	95%c.i.	TD%	0	1-4	5-9	10-14	**Total**	**ASR**	95%c.i.	TD%	0	1-4	5-9	10-14	**Total**	**ASR**	95%c.i.	TD%
XII. OTHER																								
All					**0**								**0**								**0**			
Other specified malignancy					**0**								**0**								**0**			
Other unspecified malignancy					**0**								**0**								**0**			
Total																								
	4	13	5	8	**30**	**15.9**	10.1-21.7	93	5	8	4	9	**26**	**14.1**	8.6-19.6	92	9	21	9	17	**56**	**15.0**	11.0-19.0	93
	32.4	25.3	7.3	11.1					41.8	16.3	6.2	13.1					37.0	20.9	6.7	12.0				

Appendix 3D. Cancer incidence, Western Australia, 2004: leading types by sex and geographic area

CHS Kimberley Region

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**6**	16.2	**38.6**	7.4-69.8	26
Lung	**4**	10.8	**27.5**	0.2-54.9	22
Colorectal	**3**	8.1	**27.0**	0 - 57.5	20
Colon	**2**	5.4	**17.6**	0 - 41.9	28
Rectum	**1**	2.7	**9.4**	0 - 27.8	64
Oesophagus	**3**	8.1	**17.7**	0 - 38.3	78
Melanoma (skin)	**3**	8.1	**16.2**	0 - 34.5	100
Kidney	**2**	5.4	**14.3**	0 - 34.3	50
Thyroid gland	**2**	5.4	**12.8**	0 - 31.2	43
All cancers	**37**	100.0	**237.7**	159-316	4

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**8**	25.0	**52.6**	13.2-91.9	20
Uterus	**4**	12.5	**26.2**	0.6-51.7	33
Unknown primary	**3**	9.4	**25.6**	0 - 56.0	22
Colorectal	**2**	6.3	**16.4**	0 - 39.6	121
Colon	**2**	6.3	**16.4**	0 - 39.6	121
Rectum	**0**				
Oesophagus	**2**	6.3	**17.2**	0 - 41.7	47
Pancreas	**2**	6.3	**19.0**	0 - 46.4	26
Lung	**2**	6.3	**12.4**	0 - 29.7	81
Thyroid gland	**2**	6.3	**16.1**	0 - 41.3	30
Lymphoma	**2**	6.3	**9.9**	0 - 24.1	108
Lymphoma NOS	**0**				
Hodgkin lymphoma	**0**				
NHL	**2**	6.3	**9.9**	0 - 24.1	108
All cancers	**32**	100.0	**244.2**	155-334	3

CHS Pilbara-Gascoyne Region

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**23**	29.5	**117.9**	66.9-169	7
Lung	**10**	12.8	**50.3**	17.2-83.5	16
Colorectal	**9**	11.5	**36.6**	10.1-63.0	21
Colon	**5**	6.4	**21.2**	0.9-41.4	36
Rectum	**4**	5.1	**15.4**	0 - 32.5	52
Melanoma (skin)	**6**	7.7	**27.7**	3.2-52.2	25
Lymphoma	**4**	5.1	**11.9**	0 - 23.9	131
Lymphoma NOS	**0**				
Hodgkin lymphoma	**1**	1.3	**2.2**	0 - 6.4	553
NHL	**3**	3.8	**9.7**	0 - 21.0	172
Larynx	**3**	3.8	**15.9**	0 - 35.2	35
Leukaemia	**3**	3.8	**8.3**	0 - 17.8	120
Leukaemia NOS	**0**				
Lymphoid leukaemia	**2**	2.6	**5.6**	0 - 13.3	180
Myeloid leukaemia	**0**				
Leukaemia, other	**1**	1.3	**2.8**	0 - 8.2	360
All cancers	**78**	100.0	**359.7**	274-445	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**18**	31.6	**78.6**	39.2-118	11
Melanoma (skin)	**8**	14.0	**40.6**	10.4-70.9	22
Lung	**6**	10.5	**42.9**	6.6-79.2	16
Colorectal	**5**	8.8	**35.2**	3.1-67.4	22
Colon	**5**	8.8	**35.2**	3.1-67.4	22
Rectum	**0**				
Thyroid gland	**3**	5.3	**11.6**	0 - 24.6	106
Lip	**2**	3.5	**13.8**	0 - 34.6	53
Lymphoma	**2**	3.5	**7.5**	0 - 18.3	468
Lymphoma NOS	**0**				
Hodgkin lymphoma	**0**				
NHL	**2**	3.5	**7.5**	0 - 18.3	468
All cancers	**57**	100.0	**288.9**	208-370	4

CHS Midwest-Murchison Region

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**49**	35.3	**138.7**	99.7-178	6
Lung	**15**	10.8	**34.5**	16.7-52.4	26
Colorectal	**11**	7.9	**28.2**	11.2-45.2	28
Colon	**4**	2.9	**10.8**	0.1-21.5	94
Rectum	**7**	5.0	**17.4**	4.2-30.7	40
Melanoma (skin)	**11**	7.9	**34.0**	12.6-55.4	42
Stomach	**6**	4.3	**12.5**	2.3-22.7	156
Unknown primary	**6**	4.3	**15.5**	3.0-28.0	57
Lymphoma	**5**	3.6	**14.5**	1.8-27.3	46
Lymphoma NOS	**0**				
Hodgkin lymphoma	**1**	0.7	**2.9**	0 - 8.6	344
NHL	**4**	2.9	**11.6**	0.2-23.1	54
Leukaemia	**5**	3.6	**14.0**	1.6-26.4	84
All cancers	**139**	100.0	**381.6**	317-446	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**32**	32.3	**100.0**	64.9-135	9
Melanoma (skin)	**11**	11.1	**32.2**	12.9-51.5	29
Colorectal	**9**	9.1	**23.6**	6.1-41.1	62
Colon	**6**	6.1	**17.0**	1.4-32.7	77
Rectum	**3**	3.0	**6.6**	0 - 14.5	307
Lung	**8**	8.1	**22.2**	6.1-38.2	62
Lymphoma	**6**	6.1	**16.3**	2.8-29.9	58
Lymphoma NOS	**1**	1.0	**3.6**	0 - 10.8	220
Hodgkin lymphoma	**1**	1.0	**2.9**	0 - 8.6	274
NHL	**4**	4.0	**9.8**	0 - 19.8	108
Uterus	**5**	5.1	**13.6**	1.5-25.7	49
Ovary	**4**	4.0	**17.3**	0 - 34.9	75
Vulva & vagina	**3**	3.0	**7.9**	0 - 17.1	99
All cancers	**99**	100.0	**294.2**	234-354	4

Notes: - no data; * no data <75 years or risk less than 1 in 10,000

Appendix 3D. Cancer incidence, Western Australia, 2004: leading types by sex and geographic area

CHS Wheatbelt Region

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**69**	31.2	**111.5**	84.9-138	7
Colorectal	**25**	11.3	**40.0**	24.2-55.9	25
Colon	**12**	5.4	**20.2**	8.8-31.7	35
Rectum	**13**	5.9	**19.8**	8.8-30.8	82
Lung	**23**	10.4	**39.6**	22.4-56.7	21
Melanoma (skin)	**22**	10.0	**41.5**	23.4-59.7	24
Unknown primary	**10**	4.5	**14.3**	5.3-23.3	50
Lip	**7**	3.2	**11.0**	2.7-19.4	85
Kidney	**7**	3.2	**11.5**	2.9-20.1	48
Lymphoma	**6**	2.7	**9.5**	1.8-17.3	74
Lymphoma NOS	**0**				
Hodgkin lymphoma	**1**	0.5	**1.6**	0 - 4.8	246
NHL	**5**	2.3	**7.9**	0.9-14.9	105
All cancers	**221**	100.0	**377.8**	326-430	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**36**	26.5	**67.8**	45.0-90.7	14
Melanoma (skin)	**21**	15.4	**44.9**	25.0-64.9	21
Colorectal	**16**	11.8	**27.4**	13.4-41.3	34
Colon	**11**	8.1	**18.1**	6.9-29.4	50
Rectum	**5**	3.7	**9.3**	1.0-17.5	101
Lung	**8**	5.9	**13.3**	3.5-23.0	68
Unknown primary	**6**	4.4	**8.5**	1.2-15.7	106
Lip	**5**	3.7	**8.6**	0.7-16.5	104
Uterus	**5**	3.7	**9.0**	1.1-16.8	83
Thyroid gland	**5**	3.7	**10.2**	1.2-19.2	82
Leukaemia	**4**	2.9	**11.0**	0 - 23.1	106
Leukaemia NOS	**0**				
Lymphoid leukaemia	**0**				
Myeloid leukaemia	**4**	2.9	**11.0**	0 - 23.1	106
Leukaemia, other	**0**				
All cancers	**136**	100.0	**254.5**	209-299	4

CHS Goldfields-SE Coastal Region

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**28**	29.8	**101.0**	62.9-139	8
Colorectal	**12**	12.8	**43.5**	18.3-68.7	18
Colon	**7**	7.4	**27.3**	6.8-47.8	28
Rectum	**5**	5.3	**16.2**	1.7-30.8	51
Melanoma (skin)	**9**	9.6	**29.8**	9.8-49.7	25
Lung	**7**	7.4	**27.7**	6.8-48.7	23
Mesothelioma	**4**	4.3	**16.1**	0.1-32.1	35
Bladder	**4**	4.3	**15.9**	0 - 31.9	42
Oesophagus	**3**	3.2	**9.1**	0 - 19.4	416
Unknown primary	**3**	3.2	**9.1**	0 - 19.3	416
Lymphoma	**3**	3.2	**9.1**	0 - 19.4	416
Lymphoma NOS	**1**	1.1	**2.9**	0 - 8.6	416
Hodgkin lymphoma	**0**				
NHL	**2**	2.1	**6.2**	0 - 14.8	*
Myelodysplastic diseases	**3**	3.2	**13.3**	0 - 28.3	39
All cancers	**94**	100.0	**336.7**	268-406	3

Females

	Cases	%	ASR	95%c.i.	Risk
Melanoma (skin)	**8**	13.1	**26.0**	7.2-44.7	34
Breast	**7**	11.5	**24.1**	5.7-42.5	48
Colorectal	**5**	8.2	**18.7**	1.2-36.2	49
Colon	**3**	4.9	**7.9**	0 - 17.0	206
Rectum	**2**	3.3	**10.8**	0 - 25.7	64
Lung	**5**	8.2	**25.6**	3.1-48.0	20
Unknown primary	**5**	8.2	**15.6**	0.8-30.3	86
Lymphoma	**5**	8.2	**19.2**	1.4-36.9	56
Lymphoma NOS	**0**				
Hodgkin lymphoma	**1**	1.6	**3.9**	0 - 11.5	411
NHL	**4**	6.6	**15.3**	0 - 31.3	65
Ovary	**4**	6.6	**16.4**	0 - 32.7	41
Uterus	**3**	4.9	**9.5**	0 - 20.3	145
All cancers	**61**	100.0	**234.6**	173-296	4

CHS Great Southern Region

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**52**	33.8	**117.7**	85.1-150	7
Colorectal	**28**	18.2	**56.1**	34.7-77.6	17
Colon	**17**	11.0	**32.2**	16.4-48.0	28
Rectum	**11**	7.1	**23.9**	9.4-38.5	40
Melanoma (skin)	**17**	11.0	**48.7**	24.2-73.1	20
Lung	**8**	5.2	**15.9**	4.7-27.0	48
Lymphoma	**8**	5.2	**22.5**	5.6-39.3	43
Lymphoma NOS	**0**				
Hodgkin lymphoma	**1**	0.6	**3.2**	0 - 9.5	373
NHL	**7**	4.5	**19.3**	3.6-34.9	49
Skin (NMSC exc. SCC/BCC)	**4**	2.6	**8.1**	0 - 16.3	94
Thyroid gland	**4**	2.6	**10.7**	0.2-21.2	79
Leukaemia	**4**	2.6	**7.2**	0 - 14.6	130
All cancers	**154**	100.0	**350.1**	292-408	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**33**	27.5	**84.1**	54.7-113	11
Melanoma (skin)	**18**	15.0	**40.9**	19.7-62.1	30
Colorectal	**16**	13.3	**31.6**	14.9-48.3	28
Colon	**11**	9.2	**18.2**	6.3-30.1	53
Rectum	**5**	4.2	**13.4**	1.6-25.1	58
Lung	**7**	5.8	**11.7**	2.3-21.2	57
Uterus	**6**	5.0	**16.0**	3.0-29.0	44
Ovary	**6**	5.0	**8.8**	1.2-16.4	122
Pancreas	**4**	3.3	**9.5**	0.1-19.0	56
Lymphoma	**4**	3.3	**10.4**	0.1-20.7	65
Lymphoma NOS	**0**				
Hodgkin lymphoma	**0**				
NHL	**4**	3.3	**10.4**	0.1-20.7	65
Oesophagus	**3**	2.5	**3.7**	0 - 7.8	*
Kidney	**3**	2.5	**6.2**	0 - 13.6	133
Unknown primary	**3**	2.5	**4.6**	0 - 10.3	238
All cancers	**120**	100.0	**261.1**	211-311	4

Appendix 3D. Cancer incidence, Western Australia, 2004: leading types by sex and geographic area

CHS South West Region

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**105**	28.6	**102.0**	81.9-122	8
Colorectal	**51**	13.9	**46.1**	33.0-59.2	22
Colon	**35**	9.5	**29.9**	19.6-40.1	37
Rectum	**15**	4.1	**15.7**	7.5-23.9	53
Melanoma (skin)	**46**	12.5	**45.7**	31.7-59.7	22
Lung	**31**	8.4	**26.2**	16.6-35.9	35
Unknown primary	**15**	4.1	**14.1**	6.3-21.8	81
Leukaemia	**15**	4.1	**17.7**	7.8-27.6	63
Leukaemia NOS	**0**				
Lymphoid leukaemia	**8**	2.2	**10.3**	2.4-18.2	97
Myeloid leukaemia	**7**	1.9	**7.4**	1.4-13.3	181
Leukaemia, other	**0**				
Bladder	**12**	3.3	**8.6**	3.5-13.7	349
Lymphoma	**9**	2.5	**8.9**	2.8-15.0	126
Lymphoma NOS	**0**				
Hodgkin lymphoma	**1**	0.3	**1.3**	0 - 3.8	624
NHL	**8**	2.2	**7.6**	2.1-13.1	158
Oesophagus	**8**	2.2	**8.9**	2.7-15.1	85
Kidney	**8**	2.2	**10.2**	2.4-17.9	91
Testis	**7**	1.9	**9.9**	2.3-17.5	133
Brain	**6**	1.6	**7.2**	1.4-12.9	101
Stomach	**5**	1.4	**3.8**	0.3-7.4	456
Skin (NMSC exc. SCC/BCC)	**5**	1.4	**5.8**	0.3-11.3	207
Pancreas	**4**	1.1	**3.6**	0.0-7.2	305
Mesothelioma	**4**	1.1	**4.0**	0.1-7.9	168
Myeloma	**4**	1.1	**2.9**	0 - 6.1	624
All cancers	**367**	100.0	**357.8**	319-396	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**89**	30.1	**90.8**	71.0-111	10
Colorectal	**49**	16.6	**42.5**	29.9-55.2	18
Colon	**32**	10.8	**27.2**	17.2-37.2	25
Rectum	**17**	5.7	**15.3**	7.5-23.1	58
Melanoma (skin)	**30**	10.1	**31.3**	19.4-43.1	31
Lung	**21**	7.1	**20.7**	11.4-29.9	45
Ovary	**14**	4.7	**16.9**	7.9-25.9	47
Lymphoma	**12**	4.1	**10.7**	4.2-17.1	74
Lymphoma NOS	**0**				
Hodgkin lymphoma	**0**				
NHL	**12**	4.1	**10.7**	4.2-17.1	74
Leukaemia	**9**	3.0	**8.8**	2.6-15.1	104
Leukaemia NOS	**0**				
Lymphoid leukaemia	**4**	1.4	**4.6**	0 - 9.5	221
Myeloid leukaemia	**5**	1.7	**4.2**	0.2-8.2	194
Leukaemia, other	**0**				
Uterus	**8**	2.7	**8.2**	2.4-14.0	103
Kidney	**6**	2.0	**6.9**	1.4-12.5	99
Thyroid gland	**6**	2.0	**9.1**	1.5-16.6	136
Unknown primary	**6**	2.0	**3.6**	0.5-6.6	900
Cervix	**5**	1.7	**5.0**	0.5-9.5	175
Oesophagus	**4**	1.4	**1.8**	0.0-3.6	*
Stomach	**4**	1.4	**2.3**	0 - 4.7	407
Bladder	**4**	1.4	**2.8**	0 - 5.8	204
Tongue	**3**	1.0	**2.6**	0 - 5.8	499
Gallbladder / bile ducts	**3**	1.0	**1.4**	0 - 3.0	*
Pancreas	**3**	1.0	**2.8**	0 - 6.1	243
All cancers	**296**	100.0	**289.5**	254-325	4

WA Country - all

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**332**	30.5	**109.0**	97.1-121	7
Colorectal	**139**	12.8	**42.8**	35.6-50.1	22
Colon	**82**	7.5	**24.8**	19.4-30.3	36
Rectum	**56**	5.1	**17.8**	13.1-22.6	52
Melanoma (skin)	**114**	10.5	**37.4**	30.4-44.5	26
Lung	**98**	9.0	**30.1**	24.0-36.2	27
Unknown primary	**38**	3.5	**11.6**	7.8-15.4	82
Lymphoma	**35**	3.2	**11.0**	7.3-14.7	83
Lymphoma NOS	**1**	0.1	**0.3**	0 - 1.0	3519
Hodgkin lymphoma	**5**	0.5	**1.7**	0.2-3.2	453
NHL	**29**	2.7	**9.0**	5.6-12.3	105
Leukaemia	**34**	3.1	**11.5**	7.5-15.6	83
Leukaemia NOS	**0**				
Lymphoid leukaemia	**20**	1.8	**6.9**	3.7-10.1	133
Myeloid leukaemia	**12**	1.1	**4.2**	1.7-6.6	237
Leukaemia, other	**2**	0.2	**0.5**	0 - 1.3	3134
Kidney	**26**	2.4	**8.8**	5.3-12.4	81
Oesophagus	**24**	2.2	**7.7**	4.5-10.8	115
Bladder	**24**	2.2	**6.5**	3.8-9.1	198
Lip	**18**	1.7	**5.9**	3.1-8.7	146
Pancreas	**18**	1.7	**5.6**	2.9-8.3	170
Stomach	**15**	1.4	**3.9**	1.9-6.0	384
Brain	**15**	1.4	**6.1**	2.8-9.3	180
Testis	**14**	1.3	**6.1**	2.8-9.4	230
Mesothelioma	**13**	1.2	**4.3**	2.0-6.7	167
Myeloma	**12**	1.1	**3.9**	1.6-6.1	223
Thyroid gland	**11**	1.0	**4.2**	1.7-6.8	185
Myeloprolif. d/o (chronic)	**10**	0.9	**3.3**	1.2-5.4	235
All cancers	**1090**	100.0	**352.8**	331-374	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**223**	27.8	**77.5**	67.1-87.9	12
Colorectal	**102**	12.7	**31.9**	25.3-38.4	27
Colon	**70**	8.7	**21.2**	15.9-26.4	39
Rectum	**32**	4.0	**10.7**	6.8-14.5	82
Melanoma (skin)	**96**	12.0	**33.4**	26.5-40.3	29
Lung	**57**	7.1	**18.8**	13.7-23.9	44
Lymphoma	**34**	4.2	**11.3**	7.3-15.3	79
Lymphoma NOS	**1**	0.1	**0.4**	0 - 1.3	1790
Hodgkin lymphoma	**2**	0.2	**0.9**	0 - 2.2	1282
NHL	**31**	3.9	**9.9**	6.3-13.6	89
Uterus	**32**	4.0	**11.1**	7.2-15.0	70
Ovary	**31**	3.9	**11.2**	7.1-15.4	76
Unknown primary	**26**	3.2	**7.3**	4.3-10.2	135
Thyroid gland	**20**	2.5	**8.1**	4.5-11.7	123
Kidney	**17**	2.1	**5.4**	2.7-8.1	154
Leukaemia	**16**	2.0	**5.7**	2.7-8.8	161
Leukaemia NOS	**0**				
Lymphoid leukaemia	**6**	0.7	**2.1**	0.3-3.8	546
Myeloid leukaemia	**10**	1.2	**3.7**	1.2-6.2	227
Leukaemia, other	**0**				
Pancreas	**14**	1.7	**4.7**	2.1-7.3	131
Cervix	**14**	1.7	**4.9**	2.3-7.5	185
Oesophagus	**12**	1.5	**2.8**	1.1-4.6	709
Lip	**11**	1.4	**4.1**	1.5-6.7	233
Gallbladder / bile ducts	**9**	1.1	**2.2**	0.7-3.8	500
Stomach	**8**	1.0	**2.1**	0.5-3.7	441
Vulva & vagina	**8**	1.0	**2.8**	0.8-4.7	281
Tongue	**7**	0.9	**2.2**	0.5-3.9	534
All cancers	**801**	100.0	**270.8**	251-290	4

Appendix 3D. Cancer incidence, Western Australia, 2004: leading types by sex and geographic area

North Metro AHS

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**602**	28.8	**108.8**	100.0-118	7
Colorectal	**254**	12.1	**43.8**	38.3-49.4	20
Colon	**153**	7.3	**26.2**	21.9-30.5	33
Rectum	**101**	4.8	**17.6**	14.1-21.2	48
Melanoma (skin)	**236**	11.3	**43.3**	37.7-49.0	22
Lung	**218**	10.4	**36.2**	31.2-41.2	23
Lymphoma	**79**	3.8	**14.4**	11.1-17.6	59
Lymphoma NOS	**3**	0.1	**0.5**	0 - 1.1	5608
Hodgkin lymphoma	**4**	0.2	**0.9**	0.0-1.9	1553
NHL	**72**	3.4	**12.9**	9.8-16.0	62
Leukaemia	**61**	2.9	**11.7**	8.6-14.7	78
Leukaemia NOS	**1**	0.0	**0.1**	0 - 0.4	*
Lymphoid leukaemia	**36**	1.7	**7.3**	4.8-9.8	115
Myeloid leukaemia	**15**	0.7	**2.9**	1.4-4.3	341
Leukaemia, other	**9**	0.4	**1.4**	0.5-2.4	782
Bladder	**59**	2.8	**9.5**	7.0-12.0	86
Unknown primary	**59**	2.8	**9.3**	6.8-11.8	123
Kidney	**57**	2.7	**10.2**	7.5-12.9	87
Stomach	**36**	1.7	**6.0**	4.0-8.1	159
Testis	**35**	1.7	**7.8**	5.2-10.5	162
Oesophagus	**33**	1.6	**6.2**	4.0-8.4	114
Brain	**31**	1.5	**6.3**	3.9-8.7	153
Lip	**27**	1.3	**4.9**	3.0-6.8	192
Myelodysplastic diseases	**27**	1.3	**4.0**	2.4-5.5	295
Mesothelioma	**26**	1.2	**4.3**	2.6-6.0	190
Skin (NMSC exc. SCC/BCC)	**25**	1.2	**4.3**	2.6-6.1	288
Liver	**24**	1.1	**4.4**	2.5-6.4	231
Pancreas	**23**	1.1	**3.9**	2.3-5.6	218
Myeloma	**21**	1.0	**3.6**	2.1-5.2	207
All cancers	**2091**	100.0	**372.6**	356-389	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**484**	29.3	**82.9**	75.3-90.6	11
Colorectal	**186**	11.2	**27.6**	23.3-31.9	31
Colon	**123**	7.4	**17.5**	14.2-20.9	50
Rectum	**62**	3.7	**9.9**	7.2-12.5	80
Melanoma (skin)	**158**	9.6	**26.5**	22.2-30.8	38
Lung	**129**	7.8	**19.3**	15.7-22.8	38
Lymphoma	**82**	5.0	**13.5**	10.3-16.6	71
Lymphoma NOS	**5**	0.3	**0.7**	0.1-1.4	1350
Hodgkin lymphoma	**11**	0.7	**2.7**	1.1-4.3	470
NHL	**66**	4.0	**10.0**	7.4-12.6	89
Uterus	**64**	3.9	**10.8**	8.1-13.6	75
Ovary	**58**	3.5	**9.3**	6.8-11.8	93
Thyroid gland	**56**	3.4	**11.2**	8.2-14.2	83
Pancreas	**51**	3.1	**7.4**	5.2-9.6	103
Unknown primary	**43**	2.6	**5.1**	3.4-6.8	191
Leukaemia	**35**	2.1	**6.8**	4.2-9.5	148
Leukaemia NOS	**0**				
Lymphoid leukaemia	**19**	1.1	**4.4**	2.1-6.7	261
Myeloid leukaemia	**14**	0.8	**2.2**	0.9-3.4	388
Leukaemia, other	**2**	0.1	**0.3**	0 - 0.7	2837
Cervix	**33**	2.0	**6.1**	3.9-8.2	171
Kidney	**31**	1.9	**4.7**	2.9-6.4	196
Brain	**20**	1.2	**3.9**	2.0-5.8	285
Myeloma	**20**	1.2	**2.8**	1.5-4.2	267
Myeloprolif. d/o (chronic)	**20**	1.2	**2.8**	1.5-4.2	291
Stomach	**19**	1.1	**2.2**	1.1-3.4	669
Bladder	**17**	1.0	**1.8**	0.8-2.7	638
Myelodysplastic diseases	**17**	1.0	**1.9**	0.9-3.0	494
Skin (NMSC exc. SCC/BCC)	**14**	0.8	**2.0**	0.9-3.1	401
All cancers	**1654**	100.0	**268.3**	254-282	4

South Metro AHS

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**566**	28.3	**104.5**	95.6-113	8
Colorectal	**219**	11.0	**40.7**	35.2-46.3	20
Colon	**129**	6.5	**23.9**	19.6-28.2	33
Rectum	**90**	4.5	**16.8**	13.2-20.4	50
Lung	**203**	10.2	**34.5**	29.5-39.4	27
Melanoma (skin)	**199**	10.0	**39.5**	33.8-45.1	23
Lymphoma	**92**	4.6	**17.3**	13.6-21.1	56
Lymphoma NOS	**5**	0.3	**0.5**	0.1-1.0	*
Hodgkin lymphoma	**12**	0.6	**2.9**	1.2-4.6	337
NHL	**75**	3.8	**13.9**	10.6-17.2	68
Bladder	**63**	3.2	**12.1**	9.0-15.2	64
Unknown primary	**58**	2.9	**10.3**	7.5-13.0	92
Lip	**56**	2.8	**11.0**	8.0-13.9	79
Kidney	**55**	2.8	**11.5**	8.3-14.7	72
Leukaemia	**48**	2.4	**9.7**	6.7-12.8	129
Leukaemia NOS	**0**				
Lymphoid leukaemia	**30**	1.5	**6.7**	4.0-9.3	166
Myeloid leukaemia	**14**	0.7	**2.7**	1.2-4.2	574
Leukaemia, other	**4**	0.2	**0.4**	0.0-0.8	*
Stomach	**40**	2.0	**7.4**	5.0-9.7	114
Oesophagus	**38**	1.9	**7.2**	4.8-9.5	117
Pancreas	**38**	1.9	**6.8**	4.6-9.0	113
Testis	**31**	1.6	**8.2**	5.3-11.1	165
Skin (NMSC exc. SCC/BCC)	**27**	1.4	**5.0**	3.1-7.0	231
Brain	**27**	1.4	**6.1**	3.6-8.6	171
Myeloma	**26**	1.3	**4.7**	2.8-6.6	176
Liver	**21**	1.1	**3.7**	2.1-5.4	193
Mesothelioma	**21**	1.1	**3.5**	1.9-5.1	260
Thyroid gland	**21**	1.1	**4.6**	2.6-6.6	210
All cancers	**2000**	100.0	**378.1**	361-395	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**441**	27.5	**84.8**	76.6-92.9	11
Colorectal	**189**	11.8	**29.5**	24.9-34.1	30
Colon	**141**	8.8	**21.3**	17.4-25.1	42
Rectum	**47**	2.9	**8.0**	5.6-10.4	107
Melanoma (skin)	**144**	9.0	**29.1**	24.1-34.0	33
Lung	**122**	7.6	**19.0**	15.4-22.6	44
Lymphoma	**76**	4.7	**14.0**	10.6-17.4	59
Lymphoma NOS	**3**	0.2	**0.6**	0 - 1.4	904
Hodgkin lymphoma	**10**	0.6	**2.3**	0.8-3.7	383
NHL	**63**	3.9	**11.1**	8.1-14.1	75
Uterus	**53**	3.3	**8.8**	6.2-11.3	102
Ovary	**53**	3.3	**9.6**	6.9-12.4	92
Unknown primary	**47**	2.9	**6.9**	4.7-9.2	145
Lip	**43**	2.7	**7.3**	4.9-9.6	110
Thyroid gland	**41**	2.6	**8.5**	5.8-11.2	115
Pancreas	**40**	2.5	**5.3**	3.5-7.2	192
Cervix	**38**	2.4	**8.2**	5.5-10.9	131
Kidney	**37**	2.3	**6.0**	3.7-8.3	163
Leukaemia	**37**	2.3	**6.1**	3.9-8.3	180
Leukaemia NOS	**0**				
Lymphoid leukaemia	**17**	1.1	**3.1**	1.4-4.8	333
Myeloid leukaemia	**18**	1.1	**2.7**	1.3-4.1	419
Leukaemia, other	**2**	0.1	**0.3**	0 - 0.7	5525
Stomach	**31**	1.9	**3.8**	2.3-5.3	345
Myeloma	**24**	1.5	**3.1**	1.7-4.4	281
Brain	**23**	1.4	**4.5**	2.6-6.4	194
Bladder	**19**	1.2	**2.1**	1.1-3.2	560
Myelodysplastic diseases	**17**	1.1	**2.1**	1.0-3.3	496
Oesophagus	**16**	1.0	**2.6**	1.2-4.0	270
All cancers	**1602**	100.0	**281.1**	266-296	4

Appendix 3D. Cancer incidence, Western Australia, 2004: leading types by sex and geographic area

WA Metro - all

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**1168**	28.6	**106.8**	101-113	8
Colorectal	**473**	11.6	**42.2**	38.3-46.2	20
Colon	**282**	6.9	**25.0**	22.0-28.0	33
Rectum	**191**	4.7	**17.2**	14.7-19.7	49
Melanoma (skin)	**435**	10.6	**41.4**	37.4-45.4	22
Lung	**421**	10.3	**35.3**	31.7-38.8	25
Lymphoma	**171**	4.2	**15.8**	13.3-18.2	58
Lymphoma NOS	**8**	0.2	**0.5**	0.1-0.9	*
Hodgkin lymphoma	**16**	0.4	**1.9**	0.9-2.8	572
NHL	**147**	3.6	**13.4**	11.1-15.6	65
Bladder	**122**	3.0	**10.7**	8.7-12.7	74
Unknown primary	**117**	2.9	**9.7**	7.9-11.6	106
Kidney	**112**	2.7	**10.8**	8.7-12.9	79
Leukaemia	**109**	2.7	**10.7**	8.6-12.9	96
Leukaemia NOS	**1**	0.0	**0.1**	0 - 0.2	*
Lymphoid leukaemia	**66**	1.6	**7.0**	5.2-8.8	135
Myeloid leukaemia	**29**	0.7	**2.8**	1.7-3.8	425
Leukaemia, other	**13**	0.3	**0.9**	0.4-1.5	1525
Lip	**83**	2.0	**7.8**	6.1-9.5	113
Stomach	**76**	1.9	**6.7**	5.1-8.2	134
Oesophagus	**71**	1.7	**6.7**	5.1-8.3	116
Testis	**66**	1.6	**8.0**	6.0-9.9	164
Pancreas	**61**	1.5	**5.3**	3.9-6.7	150
Brain	**58**	1.4	**6.1**	4.4-7.9	162
Skin (NMSC exc. SCC/BCC)	**52**	1.3	**4.6**	3.3-5.9	258
Mesothelioma	**47**	1.1	**3.9**	2.7-5.1	219
Myeloma	**47**	1.1	**4.2**	2.9-5.4	190
Liver	**45**	1.1	**4.1**	2.8-5.4	210
Myelodysplastic diseases	**45**	1.1	**3.3**	2.3-4.4	342
All cancers	**4091**	100.0	**374.8**	363-387	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**925**	28.4	**83.8**	78.2-89.4	11
Colorectal	**375**	11.5	**28.5**	25.4-31.7	31
Colon	**264**	8.1	**19.4**	16.8-21.9	46
Rectum	**109**	3.3	**9.0**	7.2-10.8	91
Melanoma (skin)	**302**	9.3	**27.7**	24.5-31.0	35
Lung	**251**	7.7	**19.1**	16.6-21.6	41
Lymphoma	**158**	4.9	**13.8**	11.5-16.1	64
Lymphoma NOS	**8**	0.2	**0.7**	0.2-1.2	1078
Hodgkin lymphoma	**21**	0.6	**2.5**	1.4-3.6	418
NHL	**129**	4.0	**10.6**	8.6-12.6	81
Uterus	**117**	3.6	**9.9**	8.0-11.8	86
Ovary	**111**	3.4	**9.5**	7.6-11.3	92
Thyroid gland	**97**	3.0	**9.9**	7.9-12.0	96
Pancreas	**91**	2.8	**6.4**	4.9-7.9	133
Unknown primary	**90**	2.8	**6.0**	4.6-7.4	166
Leukaemia	**72**	2.2	**6.5**	4.7-8.2	162
Leukaemia NOS	**0**				
Lymphoid leukaemia	**36**	1.1	**3.8**	2.3-5.3	291
Myeloid leukaemia	**32**	1.0	**2.4**	1.5-3.3	405
Leukaemia, other	**4**	0.1	**0.3**	0 - 0.6	3804
Cervix	**71**	2.2	**7.0**	5.3-8.7	149
Kidney	**68**	2.1	**5.3**	3.9-6.7	178
Lip	**55**	1.7	**4.5**	3.2-5.7	177
Stomach	**50**	1.5	**3.0**	2.0-3.9	460
Myeloma	**44**	1.4	**2.9**	2.0-3.9	274
Brain	**43**	1.3	**4.2**	2.8-5.5	232
Bladder	**36**	1.1	**1.9**	1.2-2.7	596
Myelodysplastic diseases	**34**	1.0	**2.0**	1.2-2.8	500
Myeloprolif. d/o (chronic)	**30**	0.9	**2.0**	1.2-2.8	468
All cancers	**3256**	100.0	**274.6**	264-285	4

All Western Australia

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**1501**	28.9	**107.4**	102-113	8
Colorectal	**612**	11.8	**42.3**	38.9-45.8	20
Colon	**364**	7.0	**24.9**	22.3-27.6	34
Rectum	**247**	4.8	**17.4**	15.1-19.6	50
Melanoma (skin)	**549**	10.6	**40.4**	37.0-43.9	23
Lung	**521**	10.0	**34.3**	31.2-37.3	25
Lymphoma	**206**	4.0	**14.7**	12.6-16.8	62
Lymphoma NOS	**9**	0.2	**0.5**	0.1-0.9	7006
Hodgkin lymphoma	**21**	0.4	**1.8**	1.0-2.6	540
NHL	**176**	3.4	**12.4**	10.5-14.3	71
Unknown primary	**155**	3.0	**10.1**	8.5-11.8	99
Bladder	**146**	2.8	**9.8**	8.1-11.4	86
Leukaemia	**143**	2.8	**10.9**	9.0-12.8	93
Leukaemia NOS	**1**	0.0	**0.0**	0 - 0.1	*
Lymphoid leukaemia	**86**	1.7	**6.9**	5.3-8.5	135
Myeloid leukaemia	**41**	0.8	**3.1**	2.1-4.1	361
Leukaemia, other	**15**	0.3	**0.9**	0.4-1.3	1721
Kidney	**138**	2.7	**10.4**	8.6-12.2	80
Lip	**101**	1.9	**7.4**	5.9-8.8	120
Oesophagus	**95**	1.8	**6.9**	5.5-8.3	116
Stomach	**91**	1.8	**6.0**	4.7-7.3	157
Pancreas	**80**	1.5	**5.5**	4.2-6.7	151
Testis	**80**	1.5	**7.5**	5.8-9.2	177
Brain	**73**	1.4	**6.1**	4.6-7.7	165
Skin (NMSC exc. SCC/BCC)	**61**	1.2	**4.2**	3.1-5.3	273
Mesothelioma	**60**	1.2	**4.0**	3.0-5.1	205
Myeloma	**59**	1.1	**4.1**	3.0-5.2	196
Liver	**54**	1.0	**3.8**	2.7-4.8	238
Myelodysplastic diseases	**53**	1.0	**3.1**	2.2-4.0	341
All cancers	**5185**	100.0	**370.1**	360-380	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**1150**	28.3	**82.6**	77.7-87.5	11
Colorectal	**477**	11.8	**29.2**	26.3-32.0	30
Colon	**334**	8.2	**19.7**	17.4-22.0	44
Rectum	**141**	3.5	**9.3**	7.7-10.9	89
Melanoma (skin)	**398**	9.8	**29.0**	26.0-31.9	34
Lung	**308**	7.6	**19.1**	16.8-21.4	41
Lymphoma	**192**	4.7	**13.3**	11.3-15.3	66
Lymphoma NOS	**9**	0.2	**0.7**	0.2-1.1	1169
Hodgkin lymphoma	**23**	0.6	**2.2**	1.3-3.1	485
NHL	**160**	3.9	**10.5**	8.8-12.2	82
Uterus	**149**	3.7	**10.1**	8.4-11.8	82
Ovary	**142**	3.5	**9.9**	8.1-11.6	88
Thyroid gland	**117**	2.9	**9.5**	7.8-11.3	100
Unknown primary	**116**	2.9	**6.2**	5.0-7.5	159
Pancreas	**105**	2.6	**6.1**	4.8-7.3	133
Leukaemia	**88**	2.2	**6.3**	4.8-7.9	162
Leukaemia NOS	**0**				
Lymphoid leukaemia	**42**	1.0	**3.4**	2.2-4.6	323
Myeloid leukaemia	**42**	1.0	**2.7**	1.8-3.6	346
Leukaemia, other	**4**	0.1	**0.2**	0 - 0.5	4827
Cervix	**85**	2.1	**6.6**	5.1-8.0	156
Kidney	**85**	2.1	**5.3**	4.1-6.6	173
Lip	**66**	1.6	**4.4**	3.3-5.6	186
Stomach	**58**	1.4	**2.8**	2.0-3.6	460
Myeloma	**50**	1.2	**2.7**	1.9-3.6	301
Brain	**49**	1.2	**3.8**	2.7-5.0	247
Bladder	**41**	1.0	**1.8**	1.2-2.5	570
Oesophagus	**37**	0.9	**2.0**	1.3-2.8	459
Myelodysplastic diseases	**35**	0.9	**1.7**	1.1-2.3	599
All cancers	**4059**	100.0	**274.0**	265-283	4

Appendix 3E. Cancer mortality, Western Australia, 2004: leading types by sex and geographic area

CHS Kimberley Region

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**3**	23.1	**25.7**	0 - 54.8	18
Melanoma (skin)	**2**	15.4	**14.9**	0 - 35.5	54
Colorectal	**1**	7.7	**6.2**	0 - 18.2	*
Colon	**0**				-
Rectum	**1**	7.7	**6.2**	0 - 18.2	*
Nasopharynx	**1**	7.7	**5.1**	0 - 14.9	199
Hypopharynx	**1**	7.7	**9.4**	0 - 27.8	64
Pharynx	**1**	7.7	**9.4**	0 - 27.8	64
Oesophagus	**1**	7.7	**5.0**	0 - 14.7	242
Pancreas	**1**	7.7	**7.4**	0 - 22.0	108
Kidney	**1**	7.7	**6.2**	0 - 18.2	*
Myeloma	**1**	7.7	**9.4**	0 - 27.8	64
All cancer deaths	**13**	100.0	**98.7**	44.2-153	8

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**4**	25.0	**40.4**	0 - 80.9	18
Lung	**3**	18.8	**19.1**	0 - 40.7	49
Oesophagus	**2**	12.5	**12.9**	0 - 30.7	69
Pancreas	**2**	12.5	**19.0**	0 - 46.4	26
Unknown primary	**2**	12.5	**19.0**	0 - 46.4	26
Tonsil / oropharynx	**1**	6.3	**6.2**	0 - 18.4	161
Small intestine	**1**	6.3	**11.9**	0 - 35.1	51
Myeloma	**1**	6.3	**6.2**	0 - 18.4	161
All cancer deaths	**16**	100.0	**134.6**	65.7-203	5

CHS Pilbara-Gascoyne Region

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**7**	29.2	**30.8**	6.6-55.1	27
Oesophagus	**4**	16.7	**21.8**	0 - 44.6	38
Pancreas	**3**	12.5	**16.0**	0 - 35.3	36
Prostate	**2**	8.3	**11.6**	0 - 28.3	82
Leukaemia	**2**	8.3	**12.3**	0 - 29.9	46
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**2**	8.3	**12.3**	0 - 29.9	46
Myeloid leukaemia	**0**				-
Leukaemia, other	**0**				-
Hypopharynx	**1**	4.2	**4.2**	0 - 12.5	*
Liver	**1**	4.2	**7.8**	0 - 23.2	52
Bone	**1**	4.2	**2.8**	0 - 8.4	424
Mesothelioma	**1**	4.2	**2.4**	0 - 7.2	497
Kidney	**1**	4.2	**2.8**	0 - 8.4	424
Brain	**1**	4.2	**2.8**	0 - 8.4	424
All cancer deaths	**24**	100.0	**115.5**	65.8-165	7

Females

	Cases	%	ASR	95%c.i.	Risk
Lung	**2**	25.0	**13.4**	0 - 32.4	98
Unknown primary	**2**	25.0	**14.9**	0 - 36.5	45
Colorectal	**1**	12.5	**2.9**	0 - 8.5	418
Colon	**1**	12.5	**2.9**	0 - 8.5	418
Rectum	**0**				-
Oesophagus	**1**	12.5	**8.2**	0 - 24.2	98
Ovary	**1**	12.5	**9.8**	0 - 29.1	62
Brain	**1**	12.5	**3.7**	0 - 11.0	323
All cancer deaths	**8**	100.0	**52.9**	13.7-92.1	16

CHS Midwest-Murchison Region

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**18**	31.6	**41.7**	22.1-61.4	17
Prostate	**6**	10.5	**16.4**	3.3-29.6	42
Colorectal	**5**	8.8	**11.7**	1.0-22.3	111
Colon	**3**	5.3	**8.3**	0 - 17.8	111
Rectum	**2**	3.5	**3.4**	0 - 8.1	*
Stomach	**5**	8.8	**9.9**	1.0-18.8	*
Pancreas	**5**	8.8	**11.6**	1.0-22.3	152
Bladder	**3**	5.3	**6.0**	0 - 12.9	308
Lymphoma	**3**	5.3	**6.9**	0 - 14.8	104
Lymphoma NOS	**0**				-
Hodgkin lymphoma	**1**	1.8	**1.7**	0 - 5.0	*
NHL	**2**	3.5	**5.2**	0 - 12.4	104
Oesophagus	**2**	3.5	**5.9**	0 - 14.2	94
Larynx	**2**	3.5	**4.9**	0 - 11.8	206
Unknown primary	**2**	3.5	**4.5**	0 - 11.0	*
Leukaemia	**2**	3.5	**5.7**	0 - 13.5	*
All cancer deaths	**57**	100.0	**134.3**	98.8-170	8

Females

	Cases	%	ASR	95%c.i.	Risk
Lung	**8**	20.5	**22.8**	6.2-39.4	52
Breast	**7**	17.9	**16.5**	3.5-29.4	44
Ovary	**5**	12.8	**15.2**	1.4-28.9	54
Leukaemia	**3**	7.7	**11.7**	0 - 25.6	64
Leukaemia NOS	**1**	2.6	**3.4**	0 - 10.1	177
Lymphoid leukaemia	**0**				-
Myeloid leukaemia	**2**	5.1	**8.3**	0 - 20.5	100
Leukaemia, other	**0**				-
Colorectal	**2**	5.1	**5.5**	0 - 13.6	220
Colon	**1**	2.6	**3.6**	0 - 10.8	220
Rectum	**1**	2.6	**1.9**	0 - 5.6	*
Unknown primary	**2**	5.1	**6.3**	0 - 15.1	108
Lymphoma	**2**	5.1	**5.2**	0 - 12.6	307
All cancer deaths	**39**	100.0	**109.7**	73.6-146	9

Notes: - no data; * no data <75 years or risk less than 1 in 10,000

Appendix 3E. Cancer mortality, Western Australia, 2004: leading types by sex and geographic area

CHS Wheatbelt Region

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**16**	22.9	**24.9**	12.5-37.3	28
Colorectal	**9**	12.9	**15.4**	5.3-25.5	52
Colon	**6**	8.6	**10.4**	2.1-18.8	75
Rectum	**3**	4.3	**5.0**	0 - 10.6	171
Prostate	**9**	12.9	**13.3**	4.5-22.1	114
Unknown primary	**6**	8.6	**8.8**	1.7-16.0	77
Pancreas	**5**	7.1	**7.6**	0.7-14.5	169
Kidney	**4**	5.7	**6.4**	0.0-12.8	108
Oesophagus	**3**	4.3	**4.6**	0 - 10.0	191
Liver	**3**	4.3	**4.0**	0 - 8.8	433
Melanoma (skin)	**3**	4.3	**5.1**	0 - 10.9	183
Myelodysplastic diseases	**3**	4.3	**4.1**	0 - 8.8	*
Tongue	**2**	2.9	**3.5**	0 - 8.3	157
Stomach	**2**	2.9	**3.0**	0 - 7.3	433
Mesothelioma	**2**	2.9	**3.0**	0 - 7.3	433
All cancer deaths	**70**	100.0	**108.6**	82.8-134	8

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**11**	18.6	**15.4**	5.5-25.3	76
Colorectal	**9**	15.3	**13.7**	4.2-23.1	59
Colon	**5**	8.5	**8.1**	0.8-15.5	84
Rectum	**4**	6.8	**5.5**	0 - 11.5	188
Lung	**6**	10.2	**10.5**	1.7-19.2	88
Brain	**6**	10.2	**14.6**	2.1-27.0	51
Ovary	**4**	6.8	**6.3**	0 - 12.8	190
Leukaemia	**4**	6.8	**6.7**	0 - 13.6	122
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**1**	1.7	**0.8**	0 - 2.4	*
Myeloid leukaemia	**3**	5.1	**5.9**	0 - 12.6	122
Leukaemia, other	**0**				-
Unknown primary	**3**	5.1	**4.1**	0 - 9.1	370
Myeloma	**3**	5.1	**4.5**	0 - 9.8	109
Melanoma (skin)	**2**	3.4	**3.0**	0 - 7.5	370
Lymphoma	**2**	3.4	**3.8**	0 - 9.0	181
All cancer deaths	**59**	100.0	**94.9**	68.7-121	10

CHS Goldfields-SE Coastal Region

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**7**	21.9	**23.4**	5.7-41.1	39
Colorectal	**3**	9.4	**9.8**	0 - 21.1	120
Colon	**2**	6.3	**5.8**	0 - 13.8	300
Rectum	**1**	3.1	**4.0**	0 - 11.9	199
Liver	**3**	9.4	**8.7**	0 - 18.5	175
Prostate	**3**	9.4	**10.7**	0 - 22.8	199
Bladder	**3**	9.4	**11.1**	0 - 23.8	100
Melanoma (skin)	**2**	6.3	**6.2**	0 - 14.8	*
Brain	**2**	6.3	**5.3**	0 - 12.7	555
Leukaemia	**2**	6.3	**8.9**	0 - 21.3	70
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**0**				-
Myeloid leukaemia	**2**	6.3	**8.9**	0 - 21.3	70
Leukaemia, other	**0**				-
Myeloma	**2**	6.3	**7.5**	0 - 18.4	65
All cancer deaths	**32**	100.0	**108.1**	70.0-146	11

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**7**	26.9	**24.3**	5.5-43.1	34
Unknown primary	**6**	23.1	**17.7**	2.4-33.0	86
Lung	**3**	11.5	**13.5**	0 - 28.9	42
Kidney	**2**	7.7	**5.9**	0 - 14.0	*
Brain	**2**	7.7	**8.7**	0 - 21.1	92
Colorectal	**1**	3.8	**4.5**	0 - 13.4	89
Colon	**1**	3.8	**4.5**	0 - 13.4	89
Rectum	**0**				-
Oesophagus	**1**	3.8	**2.1**	0 - 6.2	*
Pancreas	**1**	3.8	**5.3**	0 - 15.6	152
Nasal cavity & sinuses	**1**	3.8	**2.0**	0 - 5.8	*
Melanoma (skin)	**1**	3.8	**4.5**	0 - 13.4	89
Ovary	**1**	3.8	**5.3**	0 - 15.6	152
All cancer deaths	**26**	100.0	**93.7**	55.7-132	9

CHS Great Southern Region

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**10**	17.2	**18.6**	6.5-30.8	45
Prostate	**10**	17.2	**16.5**	6.0-26.9	76
Colorectal	**9**	15.5	**19.8**	6.3-33.3	48
Colon	**8**	13.8	**17.0**	4.7-29.2	57
Rectum	**1**	1.7	**2.9**	0 - 8.5	278
Bladder	**4**	6.9	**5.7**	0 - 11.4	195
Oesophagus	**3**	5.2	**5.1**	0 - 11.1	258
Pancreas	**3**	5.2	**6.7**	0 - 14.3	78
Tongue	**2**	3.4	**4.7**	0 - 11.1	148
Skin (not melanoma)	**2**	3.4	**4.0**	0 - 9.6	344
Unknown primary	**2**	3.4	**5.5**	0 - 13.1	161
Leukaemia	**2**	3.4	**4.3**	0 - 11.0	373
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**0**				-
Myeloid leukaemia	**1**	1.7	**3.2**	0 - 9.5	373
Leukaemia, other	**1**	1.7	**1.1**	0 - 3.3	*
Myelodysplastic diseases	**2**	3.4	**4.4**	0 - 10.5	111
All cancer deaths	**58**	100.0	**115.9**	84.3-148	9

Females

	Cases	%	ASR	95%c.i.	Risk
Colorectal	**4**	11.1	**5.6**	0 - 11.7	238
Colon	**4**	11.1	**5.6**	0 - 11.7	238
Rectum	**0**				-
Pancreas	**4**	11.1	**9.5**	0.1-19.0	56
Lung	**4**	11.1	**7.1**	0 - 15.0	128
Breast	**4**	11.1	**7.9**	0 - 16.1	81
Ovary	**3**	8.3	**3.7**	0 - 8.3	195
Melanoma (skin)	**2**	5.6	**1.9**	0 - 4.5	*
Kidney	**2**	5.6	**3.4**	0 - 8.7	321
Brain	**2**	5.6	**5.0**	0 - 11.9	133
Unknown primary	**2**	5.6	**4.1**	0 - 10.3	413
Lymphoma	**2**	5.6	**5.0**	0 - 12.0	119
Lymphoma NOS	**0**				-
Hodgkin lymphoma	**0**				-
NHL	**2**	5.6	**5.0**	0 - 12.0	119
All cancer deaths	**36**	100.0	**65.0**	41.9-88.0	13

Appendix 3E. Cancer mortality, Western Australia, 2004: leading types by sex and geographic area

CHS South West Region

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**25**	18.2	**19.2**	11.3-27.2	55
Colorectal	**22**	16.1	**19.1**	10.8-27.4	52
Colon	**13**	9.5	**11.3**	4.9-17.7	102
Rectum	**9**	6.6	**7.8**	2.5-13.0	107
Prostate	**17**	12.4	**12.7**	6.5-18.8	133
Unknown primary	**10**	7.3	**9.0**	3.3-14.7	113
Pancreas	**7**	5.1	**5.4**	1.3-9.5	305
Leukaemia	**7**	5.1	**6.9**	1.6-12.3	175
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**3**	2.2	**3.0**	0 - 6.6	328
Myeloid leukaemia	**4**	2.9	**3.9**	0 - 7.9	374
Leukaemia, other	**0**				-
Oesophagus	**6**	4.4	**6.0**	1.1-10.9	135
Melanoma (skin)	**6**	4.4	**6.4**	0.7-12.0	178
Mesothelioma	**5**	3.6	**5.5**	0.6-10.4	107
Lymphoma	**5**	3.6	**4.6**	0.3-8.8	312
Lymphoma NOS	**0**				-
Hodgkin lymphoma	**1**	0.7	**1.3**	0 - 3.8	624
NHL	**4**	2.9	**3.3**	0 - 6.7	624
Stomach	**4**	2.9	**4.0**	0 - 8.1	164
Brain	**4**	2.9	**4.2**	0.0-8.3	262
Myeloma	**3**	2.2	**2.6**	0 - 5.6	200
Tongue	**2**	1.5	**1.9**	0 - 4.5	420
Mouth, floor	**2**	1.5	**1.8**	0 - 4.4	502
Salivary glands	**2**	1.5	**1.8**	0 - 4.2	840
Hypopharynx	**2**	1.5	**2.3**	0 - 5.5	243
Skin (not melanoma)	**2**	1.5	**2.6**	0 - 6.1	312
Kidney	**2**	1.5	**2.0**	0 - 4.7	270
Myelodysplastic diseases	**2**	1.5	**1.1**	0 - 2.5	*
All cancer deaths	**137**	100.0	**121.4**	100-143	9

Females

	Cases	%	ASR	95%c.i.	Risk
Colorectal	**19**	22.4	**11.8**	5.9-17.8	96
Colon	**16**	18.8	**9.7**	4.5-15.0	114
Rectum	**3**	3.5	**2.1**	0 - 4.9	603
Lung	**11**	12.9	**12.3**	5.0-19.6	50
Breast	**10**	11.8	**10.0**	3.6-16.5	88
Ovary	**6**	7.1	**5.3**	0.8-9.8	165
Unknown primary	**6**	7.1	**4.7**	0.6-8.7	361
Gallbladder / bile ducts	**4**	4.7	**1.9**	0.0-3.9	*
Pancreas	**3**	3.5	**2.0**	0 - 4.5	783
Kidney	**3**	3.5	**2.5**	0 - 5.6	228
Lymphoma	**3**	3.5	**2.0**	0 - 4.4	900
Lymphoma NOS	**0**				-
Hodgkin lymphoma	**0**				-
NHL	**3**	3.5	**2.0**	0 - 4.4	900
Stomach	**2**	2.4	**0.9**	0 - 2.2	*
Bladder	**2**	2.4	**1.0**	0 - 2.4	*
Thyroid gland	**2**	2.4	**2.3**	0 - 5.5	243
Leukaemia	**2**	2.4	**0.9**	0 - 2.0	*
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**0**				-
Myeloid leukaemia	**2**	2.4	**0.9**	0 - 2.0	*
Leukaemia, other	**0**				-
Myeloma	**2**	2.4	**0.8**	0 - 1.9	*
All cancer deaths	**85**	100.0	**67.0**	51.1-83.0	16

WA Country - all

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**86**	22.0	**24.9**	19.5-30.3	32
Colorectal	**49**	12.5	**14.9**	10.6-19.2	66
Colon	**32**	8.2	**10.0**	6.4-13.5	100
Rectum	**17**	4.3	**4.9**	2.5-7.3	193
Prostate	**47**	12.0	**13.4**	9.5-17.3	95
Pancreas	**25**	6.4	**7.5**	4.5-10.6	132
Unknown primary	**20**	5.1	**6.1**	3.4-8.8	157
Oesophagus	**19**	4.9	**6.1**	3.3-8.9	138
Leukaemia	**15**	3.8	**5.0**	2.4-7.7	237
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**6**	1.5	**2.1**	0.3-3.8	493
Myeloid leukaemia	**7**	1.8	**2.5**	0.6-4.3	454
Leukaemia, other	**2**	0.5	**0.5**	0 - 1.2	*
Melanoma (skin)	**14**	3.6	**4.4**	2.0-6.8	268
Stomach	**12**	3.1	**3.3**	1.3-5.2	406
Mesothelioma	**11**	2.8	**3.5**	1.4-5.7	225
Bladder	**11**	2.8	**3.0**	1.2-4.8	455
Kidney	**10**	2.6	**3.2**	1.2-5.2	249
Lymphoma	**10**	2.6	**3.0**	1.1-4.9	328
Lymphoma NOS	**0**				-
Hodgkin lymphoma	**3**	0.8	**1.0**	0 - 2.1	745
NHL	**7**	1.8	**2.1**	0.5-3.6	586
Liver	**9**	2.3	**2.7**	0.8-4.5	443
Brain	**8**	2.0	**2.6**	0.8-4.4	424
Tongue	**7**	1.8	**2.4**	0.6-4.1	271
Myeloma	**7**	1.8	**2.3**	0.6-4.0	240
Myelodysplastic diseases	**7**	1.8	**1.9**	0.4-3.4	677
Hypopharynx	**5**	1.3	**1.6**	0.2-3.0	428
Skin (not melanoma)	**5**	1.3	**1.7**	0.2-3.1	583
All cancer deaths	**391**	100.0	**118.1**	106-130	8

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**43**	16.0	**13.6**	9.3-17.8	62
Lung	**37**	13.8	**12.9**	8.6-17.3	61
Colorectal	**36**	13.4	**9.3**	6.0-12.6	105
Colon	**28**	10.4	**7.2**	4.3-10.2	127
Rectum	**8**	3.0	**2.1**	0.5-3.6	623
Unknown primary	**23**	8.6	**6.7**	3.8-9.7	159
Ovary	**20**	7.4	**6.3**	3.4-9.2	134
Pancreas	**12**	4.5	**4.0**	1.6-6.3	162
Brain	**12**	4.5	**4.8**	2.1-7.6	146
Leukaemia	**10**	3.7	**3.4**	1.1-5.7	223
Leukaemia NOS	**1**	0.4	**0.4**	0 - 1.2	1448
Lymphoid leukaemia	**2**	0.7	**0.5**	0 - 1.3	1129
Myeloid leukaemia	**7**	2.6	**2.5**	0.5-4.5	343
Leukaemia, other	**0**				-
Kidney	**9**	3.3	**2.4**	0.7-4.0	412
Lymphoma	**9**	3.3	**2.8**	0.9-4.8	312
Lymphoma NOS	**0**				-
Hodgkin lymphoma	**0**				-
NHL	**9**	3.3	**2.8**	0.9-4.8	312
Gallbladder / bile ducts	**7**	2.6	**1.8**	0.4-3.3	500
Myeloma	**7**	2.6	**2.0**	0.4-3.5	372
Oesophagus	**6**	2.2	**1.7**	0.2-3.1	745
Melanoma (skin)	**6**	2.2	**1.6**	0.2-3.0	535
Stomach	**4**	1.5	**1.0**	0 - 2.0	1448
Uterus	**4**	1.5	**0.7**	0.0-1.3	*
Myeloprolif. d/o (chronic)	**4**	1.5	**1.3**	0 - 2.7	500
All cancer deaths	**269**	100.0	**82.2**	71.7-92.6	11

Appendix 3E. Cancer mortality, Western Australia, 2004: leading types by sex and geographic area

North Metro AHS

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**170**	24.1	**28.3**	23.9-32.7	30
Colorectal	**87**	12.4	**14.9**	11.6-18.1	60
Colon	**52**	7.4	**9.0**	6.4-11.5	99
Rectum	**35**	5.0	**5.9**	3.9-7.9	148
Prostate	**86**	12.2	**12.1**	9.4-14.7	128
Melanoma (skin)	**37**	5.3	**6.4**	4.2-8.5	184
Lymphoma	**33**	4.7	**5.8**	3.7-7.8	162
Lymphoma NOS	**2**	0.3	**0.2**	0 - 0.6	*
Hodgkin lymphoma	**4**	0.6	**0.8**	0.0-1.5	794
NHL	**27**	3.8	**4.8**	2.9-6.6	203
Unknown primary	**31**	4.4	**4.9**	3.1-6.6	257
Stomach	**27**	3.8	**4.6**	2.8-6.4	188
Pancreas	**22**	3.1	**3.5**	2.0-5.1	267
Leukaemia	**22**	3.1	**4.2**	2.3-6.1	220
Leukaemia NOS	**1**	0.1	**0.1**	0 - 0.4	*
Lymphoid leukaemia	**8**	1.1	**1.8**	0.4-3.2	532
Myeloid leukaemia	**10**	1.4	**2.0**	0.7-3.3	374
Leukaemia, other	**3**	0.4	**0.3**	0 - 0.7	*
Liver	**21**	3.0	**3.7**	2.0-5.3	280
Brain	**21**	3.0	**3.6**	2.0-5.2	213
Mesothelioma	**19**	2.7	**2.9**	1.6-4.3	303
Bladder	**19**	2.7	**2.8**	1.5-4.0	538
Oesophagus	**18**	2.6	**3.1**	1.6-4.6	320
Kidney	**15**	2.1	**2.6**	1.2-3.9	415
Myelodysplastic diseases	**13**	1.8	**1.6**	0.7-2.5	2130
Gallbladder / bile ducts	**10**	1.4	**1.5**	0.5-2.5	570
Myeloma	**9**	1.3	**1.4**	0.4-2.3	584
Larynx	**7**	1.0	**1.0**	0.2-1.8	1074
Skin (not melanoma)	**7**	1.0	**1.1**	0.2-1.9	710
All cancer deaths	**704**	100.0	**116.2**	107-125	9

Females

	Cases	%	ASR	95%c.i.	Risk
Lung	**98**	17.2	**13.7**	10.7-16.6	58
Breast	**84**	14.8	**12.0**	9.2-14.8	79
Colorectal	**69**	12.1	**9.1**	6.7-11.4	110
Colon	**45**	7.9	**6.1**	4.1-8.0	150
Rectum	**24**	4.2	**3.0**	1.7-4.3	406
Unknown primary	**37**	6.5	**3.9**	2.5-5.4	258
Pancreas	**35**	6.2	**4.5**	2.8-6.1	177
Ovary	**34**	6.0	**4.7**	3.0-6.5	172
Lymphoma	**24**	4.2	**3.1**	1.7-4.4	304
Lymphoma NOS	**2**	0.4	**0.3**	0 - 0.8	3450
Hodgkin lymphoma	**0**				-
NHL	**22**	3.9	**2.8**	1.5-4.0	333
Brain	**22**	3.9	**3.4**	1.9-4.8	290
Stomach	**16**	2.8	**1.8**	0.8-2.9	733
Melanoma (skin)	**16**	2.8	**2.3**	1.1-3.6	366
Leukaemia	**16**	2.8	**2.3**	1.0-3.6	416
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**7**	1.2	**1.1**	0.2-2.0	809
Myeloid leukaemia	**8**	1.4	**1.1**	0.3-2.0	855
Leukaemia, other	**1**	0.2	**0.1**	0 - 0.2	*
Cervix	**13**	2.3	**2.0**	0.8-3.2	511
Myeloma	**13**	2.3	**1.9**	0.8-3.0	456
Uterus	**12**	2.1	**1.8**	0.7-2.9	411
Liver	**11**	1.9	**1.3**	0.5-2.2	1069
Kidney	**11**	1.9	**1.5**	0.5-2.5	529
Oesophagus	**9**	1.6	**1.0**	0.2-1.8	939
Gallbladder / bile ducts	**9**	1.6	**1.1**	0.3-1.9	912
Myelodysplastic diseases	**8**	1.4	**0.8**	0.2-1.5	1402
All cancer deaths	**569**	100.0	**76.4**	69.5-83.3	12

South Metro AHS

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**182**	24.7	**30.2**	25.6-34.8	30
Prostate	**73**	9.9	**11.4**	8.7-14.2	122
Colorectal	**72**	9.8	**12.7**	9.7-15.8	67
Colon	**45**	6.1	**7.6**	5.3-10.0	112
Rectum	**27**	3.7	**5.1**	3.1-7.1	165
Lymphoma	**39**	5.3	**6.4**	4.3-8.5	144
Lymphoma NOS	**0**				-
Hodgkin lymphoma	**4**	0.5	**0.7**	0 - 1.5	873
NHL	**35**	4.8	**5.6**	3.7-7.6	172
Stomach	**36**	4.9	**6.7**	4.4-9.0	119
Unknown primary	**36**	4.9	**5.9**	3.9-7.9	185
Pancreas	**33**	4.5	**5.8**	3.7-7.8	146
Melanoma (skin)	**33**	4.5	**6.0**	3.9-8.2	201
Oesophagus	**27**	3.7	**4.6**	2.8-6.4	249
Bladder	**27**	3.7	**4.7**	2.9-6.5	216
Mesothelioma	**24**	3.3	**4.3**	2.5-6.1	159
Kidney	**23**	3.1	**4.5**	2.6-6.4	172
Brain	**19**	2.6	**4.1**	2.1-6.2	269
Leukaemia	**17**	2.3	**2.8**	1.4-4.1	431
Leukaemia NOS	**0**				-
Lymphoid leukaemia	**6**	0.8	**0.9**	0.1-1.6	1329
Myeloid leukaemia	**9**	1.2	**1.5**	0.5-2.6	838
Leukaemia, other	**2**	0.3	**0.3**	0 - 0.8	2658
Liver	**16**	2.2	**3.0**	1.5-4.5	248
Myeloma	**12**	1.6	**1.9**	0.8-3.0	368
Skin (not melanoma)	**11**	1.5	**1.8**	0.7-2.9	742
Myelodysplastic diseases	**9**	1.2	**1.4**	0.4-2.4	942
Gallbladder / bile ducts	**8**	1.1	**1.4**	0.4-2.4	942
Larynx	**7**	1.0	**1.2**	0.3-2.1	650
All cancer deaths	**736**	100.0	**127.2**	118-137	8

Females

	Cases	%	ASR	95%c.i.	Risk
Lung	**115**	19.0	**16.3**	13.0-19.6	55
Breast	**96**	15.9	**16.7**	13.1-20.2	51
Colorectal	**70**	11.6	**9.1**	6.7-11.5	129
Colon	**53**	8.8	**6.6**	4.6-8.6	207
Rectum	**17**	2.8	**2.5**	1.2-3.8	343
Ovary	**35**	5.8	**5.9**	3.8-8.0	155
Unknown primary	**35**	5.8	**4.2**	2.6-5.8	301
Pancreas	**34**	5.6	**4.4**	2.8-6.0	232
Brain	**26**	4.3	**5.3**	3.1-7.5	173
Leukaemia	**25**	4.1	**3.1**	1.8-4.5	427
Leukaemia NOS	**3**	0.5	**0.4**	0 - 0.9	2723
Lymphoid leukaemia	**6**	1.0	**0.7**	0.1-1.2	5153
Myeloid leukaemia	**16**	2.6	**2.1**	0.9-3.2	562
Leukaemia, other	**0**				-
Lymphoma	**24**	4.0	**3.7**	2.1-5.3	209
Lymphoma NOS	**2**	0.3	**0.4**	0 - 1.0	1747
Hodgkin lymphoma	**1**	0.2	**0.2**	0 - 0.5	2328
NHL	**21**	3.5	**3.1**	1.7-4.6	264
Stomach	**15**	2.5	**2.0**	0.8-3.1	699
Uterus	**15**	2.5	**1.7**	0.7-2.8	679
Kidney	**15**	2.5	**2.3**	1.0-3.6	407
Melanoma (skin)	**14**	2.3	**3.0**	1.4-4.7	290
Myeloma	**14**	2.3	**1.5**	0.6-2.4	908
Bladder	**11**	1.8	**1.4**	0.5-2.2	699
Myelodysplastic diseases	**11**	1.8	**1.3**	0.4-2.1	685
Oesophagus	**9**	1.5	**1.5**	0.5-2.6	416
Cervix	**9**	1.5	**1.2**	0.3-2.1	999
Gallbladder / bile ducts	**6**	1.0	**0.8**	0.1-1.5	1476
Skin (not melanoma)	**6**	1.0	**0.6**	0.1-1.1	4874
All cancer deaths	**604**	100.0	**89.1**	81.2-97.0	11

Appendix 3E. Cancer mortality, Western Australia, 2004: leading types by sex and geographic area

WA Metro - all

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**352**	24.4	**29.2**	26.0-32.4	30
Colorectal	**159**	11.0	**13.9**	11.6-16.1	63
Colon	**97**	6.7	**8.3**	6.6-10.1	105
Rectum	**62**	4.3	**5.5**	4.1-7.0	155
Prostate	**159**	11.0	**11.7**	9.8-13.6	124
Lymphoma	**72**	5.0	**6.1**	4.6-7.6	152
Lymphoma NOS	**2**	0.1	**0.1**	0 - 0.3	*
Hodgkin lymphoma	**8**	0.6	**0.8**	0.2-1.3	828
NHL	**62**	4.3	**5.2**	3.8-6.6	186
Melanoma (skin)	**70**	4.9	**6.2**	4.7-7.7	193
Unknown primary	**67**	4.7	**5.3**	4.0-6.7	216
Stomach	**63**	4.4	**5.6**	4.2-7.1	146
Pancreas	**55**	3.8	**4.6**	3.4-5.9	190
Bladder	**46**	3.2	**3.7**	2.6-4.8	311
Oesophagus	**45**	3.1	**3.8**	2.7-5.0	282
Mesothelioma	**43**	3.0	**3.6**	2.5-4.7	209
Brain	**40**	2.8	**3.8**	2.5-5.1	238
Leukaemia	**39**	2.7	**3.5**	2.3-4.7	289
Leukaemia NOS	**1**	0.1	**0.1**	0 - 0.2	*
Lymphoid leukaemia	**14**	1.0	**1.4**	0.5-2.2	745
Myeloid leukaemia	**19**	1.3	**1.8**	0.9-2.6	518
Leukaemia, other	**5**	0.3	**0.3**	0.0-0.6	5356
Kidney	**38**	2.6	**3.5**	2.4-4.7	247
Liver	**37**	2.6	**3.3**	2.2-4.5	262
Myelodysplastic diseases	**22**	1.5	**1.5**	0.8-2.1	1321
Myeloma	**21**	1.5	**1.6**	0.9-2.4	453
Gallbladder / bile ducts	**18**	1.3	**1.5**	0.8-2.1	706
Skin (not melanoma)	**18**	1.3	**1.4**	0.7-2.1	733
Larynx	**14**	1.0	**1.1**	0.5-1.7	809
All cancer deaths	**1440**	100.0	**121.5**	115-128	8

Females

	Cases	%	ASR	95%c.i.	Risk
Lung	**213**	18.2	**14.9**	12.7-17.1	57
Breast	**180**	15.3	**14.3**	12.0-16.5	62
Colorectal	**139**	11.8	**9.1**	7.4-10.8	119
Colon	**98**	8.4	**6.3**	4.9-7.7	174
Rectum	**41**	3.5	**2.8**	1.8-3.7	371
Unknown primary	**72**	6.1	**4.1**	3.0-5.2	279
Pancreas	**69**	5.9	**4.4**	3.3-5.6	200
Ovary	**69**	5.9	**5.3**	3.9-6.7	164
Brain	**48**	4.1	**4.3**	3.0-5.6	218
Lymphoma	**48**	4.1	**3.4**	2.3-4.4	249
Lymphoma NOS	**4**	0.3	**0.4**	0 - 0.7	2357
Hodgkin lymphoma	**1**	0.1	**0.1**	0 - 0.3	4689
NHL	**43**	3.7	**2.9**	2.0-3.9	296
Leukaemia	**41**	3.5	**2.7**	1.8-3.6	423
Leukaemia NOS	**3**	0.3	**0.2**	0 - 0.4	5560
Lymphoid leukaemia	**13**	1.1	**0.9**	0.3-1.4	1384
Myeloid leukaemia	**24**	2.0	**1.6**	0.9-2.3	684
Leukaemia, other	**1**	0.1	**0.0**	0 - 0.1	*
Stomach	**31**	2.6	**1.9**	1.1-2.7	713
Melanoma (skin)	**30**	2.6	**2.6**	1.6-3.6	327
Uterus	**27**	2.3	**1.8**	1.0-2.5	507
Myeloma	**27**	2.3	**1.7**	1.0-2.4	601
Kidney	**26**	2.2	**1.9**	1.1-2.7	464
Cervix	**22**	1.9	**1.7**	0.9-2.4	665
Myelodysplastic diseases	**19**	1.6	**1.0**	0.5-1.6	927
Oesophagus	**18**	1.5	**1.3**	0.6-1.9	583
Bladder	**16**	1.4	**0.9**	0.4-1.4	1094
Liver	**15**	1.3	**0.9**	0.4-1.4	1423
Gallbladder / bile ducts	**15**	1.3	**0.9**	0.4-1.5	1114
All cancer deaths	**1173**	100.0	**82.5**	77.3-87.7	12

All Western Australia

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**438**	23.9	**28.2**	25.5-30.9	30
Colorectal	**208**	11.4	**14.1**	12.1-16.0	64
Colon	**129**	7.0	**8.7**	7.1-10.2	104
Rectum	**79**	4.3	**5.4**	4.1-6.6	163
Prostate	**206**	11.3	**12.1**	10.4-13.8	116
Unknown primary	**87**	4.8	**5.5**	4.3-6.7	199
Melanoma (skin)	**84**	4.6	**5.8**	4.5-7.1	206
Lymphoma	**82**	4.5	**5.4**	4.2-6.6	173
Lymphoma NOS	**2**	0.1	**0.1**	0 - 0.2	*
Hodgkin lymphoma	**11**	0.6	**0.8**	0.3-1.3	809
NHL	**69**	3.8	**4.5**	3.4-5.6	219
Pancreas	**80**	4.4	**5.3**	4.1-6.5	172
Stomach	**75**	4.1	**5.1**	3.9-6.3	171
Oesophagus	**64**	3.5	**4.3**	3.2-5.4	228
Bladder	**57**	3.1	**3.5**	2.6-4.5	334
Mesothelioma	**54**	2.9	**3.6**	2.6-4.6	212
Leukaemia	**54**	2.9	**3.9**	2.8-5.0	273
Leukaemia NOS	**1**	0.1	**0.0**	0 - 0.1	*
Lymphoid leukaemia	**20**	1.1	**1.5**	0.8-2.3	664
Myeloid leukaemia	**26**	1.4	**1.9**	1.2-2.7	497
Leukaemia, other	**7**	0.4	**0.4**	0.1-0.6	6948
Kidney	**48**	2.6	**3.4**	2.4-4.4	248
Brain	**48**	2.6	**3.5**	2.5-4.6	264
Liver	**46**	2.5	**3.2**	2.2-4.2	288
Myelodysplastic diseases	**29**	1.6	**1.6**	1.0-2.2	1093
Myeloma	**28**	1.5	**1.8**	1.1-2.5	378
Skin (not melanoma)	**23**	1.3	**1.5**	0.9-2.1	688
Gallbladder / bile ducts	**19**	1.0	**1.2**	0.6-1.7	910
Larynx	**18**	1.0	**1.1**	0.6-1.6	776
All cancer deaths	**1831**	100.0	**120.8**	115-127	8

Females

	Cases	%	ASR	95%c.i.	Risk
Lung	**250**	17.3	**14.6**	12.7-16.6	57
Breast	**223**	15.5	**14.1**	12.1-16.1	62
Colorectal	**175**	12.1	**9.1**	7.6-10.6	116
Colon	**126**	8.7	**6.4**	5.2-7.7	163
Rectum	**49**	3.4	**2.6**	1.8-3.4	404
Unknown primary	**95**	6.6	**4.6**	3.6-5.7	240
Ovary	**89**	6.2	**5.5**	4.3-6.7	156
Pancreas	**81**	5.6	**4.4**	3.3-5.4	192
Brain	**60**	4.2	**4.4**	3.2-5.6	199
Lymphoma	**57**	4.0	**3.3**	2.4-4.2	259
Lymphoma NOS	**4**	0.3	**0.3**	0 - 0.6	2979
Hodgkin lymphoma	**1**	0.1	**0.1**	0 - 0.2	5817
NHL	**52**	3.6	**2.9**	2.1-3.8	298
Leukaemia	**51**	3.5	**2.8**	2.0-3.7	360
Leukaemia NOS	**4**	0.3	**0.2**	0 - 0.5	3504
Lymphoid leukaemia	**15**	1.0	**0.8**	0.3-1.2	1344
Myeloid leukaemia	**31**	2.1	**1.8**	1.1-2.5	572
Leukaemia, other	**1**	0.1	**0.0**	0 - 0.1	*
Melanoma (skin)	**36**	2.5	**2.4**	1.6-3.3	357
Stomach	**35**	2.4	**1.7**	1.1-2.4	801
Kidney	**35**	2.4	**1.9**	1.2-2.7	454
Myeloma	**34**	2.4	**1.7**	1.1-2.4	537
Uterus	**31**	2.1	**1.6**	0.9-2.2	637
Oesophagus	**24**	1.7	**1.3**	0.8-1.9	606
Gallbladder / bile ducts	**22**	1.5	**1.1**	0.6-1.6	897
Cervix	**22**	1.5	**1.3**	0.7-1.9	840
Myelodysplastic diseases	**20**	1.4	**0.9**	0.4-1.3	1158
Bladder	**18**	1.2	**0.8**	0.4-1.2	1364
Liver	**17**	1.2	**0.8**	0.4-1.2	1364
Skin (not melanoma)	**13**	0.9	**0.5**	0.2-0.8	4597
All cancer deaths	**1442**	100.0	**82.5**	77.8-87.1	12