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Cancer incidence and mortality in Western Australia, 2011

A report of the Western Australian Cancer Registry

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Summary - Cancer incidence and mortality in Western Australia, 2011

The Western Australian Cancer Registry has provided population-based cancer data since 1982 for use in the planning of health care services and the support of cancer-related research, at local, national and international levels. Most of this report is concerned with invasive tumours, or "cancers", using standardised reporting practices as used in other cancer registries in Australia and overseas. This report deals primarily with cancer incidence and cancer-related mortality in Western Australian residents, who comprise approximately 10% of the Australian population.

CANCER INCIDENCE

There were 11636 new cases of cancer recorded in Western Australians in 2011, 6671 (57%) occurring in males and 4965 in females. Age-standardised incidence rates were 380 per 100,000 males, and 271 per 100,000 females. The rate in males has increased since 2010, driven largely by a 10% increase in the number of cases of prostate cancer. The estimated cumulative risk of cancer to age 75 years was 1 in 3 for males, and 1 in 4 for females.

The most common cancers in males in 2011 were prostate and colorectal cancers, melanoma and lung cancer, while breast cancer predominated among females, followed by colorectal cancer, melanoma and lung cancer, the usual pattern in recent years.

Based on 2011 data, one in 7 men would be expected to have a diagnosis of prostate cancer before the age of 75, and one in 11 women could be expected to develop breast cancer.

The decrease in prostate cancer incidence reported for 2010 is now seen as a temporary change with the rate for 2011 being higher once more. The year has seen little change in colorectal cancer incidence but lung cancer continues to decline in males and, now, females; rates of bladder cancer were lower, breast cancer was less common in females, but melanoma continued a small annual increase in incidence rates in both males and females.

CANCER MORTALITY

Among Western Australian residents, there were 3862 deaths due to cancer in 2011, 2232 in males and 1630 in females. All-cancers mortality rates for 2011 were 114 deaths per 100,000 males (marginally decreased since 2010) and 72 per 100,000 females (unchanged from 2010 but decreased from 84 in 2009). As usual in recent years, 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.

CANCER IN CHILDREN

There were 81 children under the age of 15 years diagnosed with cancer in 2011 (AAR 15 per 100,000 in males and 12 in females), as well as a small number with other cancer-like conditions. The case numbers were higher than the 58 cases in 2010 but cancer in this age range is uncommon and the annual variation in numbers and types is considerable.

OTHER CANCERS

Melanoma of the skin was - as in most years since 1982 - the most common cancer and cause of cancer-related mortality in males in the 15-39 years age range, and second most common incident cancer in females in this 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.

As in recent years, lung cancer was the most common cause of cancer-related death for both males and females, killing one in 39 males and one in 63 females before age 75. Based on 2011 data, one in 144 men could be expected to die from prostate cancer before age 75, and one in 77 women to die from breast cancer.

DATA COLLECTION

The last year has seen further advances in processing of information and streamlining some processes, with more pathology laboratories using electronic transmission methods for notification. Data quality has been a major focus, and an assessment of the way in which the Registry uses coded information from hospitals to support the completeness of the data collection is described in this report; this has led to refinement of methods and the list of priority tumour types that Registry staff most actively follow-up with data providers.

Acknowledgments

This report is based on data recorded and maintained by the staff of the Western Australian Cancer Registry, whose dedication and attention to detail are much appreciated.

We also wish to acknowledge the invaluable contribution of the Western Australian pathologists, haematologists and radiation oncologists who supply the vast majority of the Registry's primary notifications, and the health professionals and organisations who supply additional information in response to our enquiries.

The cooperation of other Australian Cancer Registries regarding procedures, coding, duplication and demarcation issues, and of staff of the Australian Cancer Database at AIHW, Canberra, is acknowledged as playing a vital part in ensuring data quality and comparability.

The Registry relies on a variety of supporting services in order to produce reports on cancer; these include population figures and projections, mapping, hospitalisation data, legal advice, computing services and general support and encouragement

1 Overview and Methods

1.1 This Report

Overview

This is the latest in this Registry's series of annual reports, and is devoted largely to Western Australian cancer incidence and mortality for 2011. In the interest of timeliness, regular sections may contain less commentary and interpretation than in some past reports, but there is substantially more coverage of technical and data-related issues. It is anticipated that more detailed discussion of particular issues will continue to be made available in other reports as the opportunity arises.

The Western Australian Cancer Registry (WACR) is a population-based cancer registry established in 1981, operating within the Department of Health (Western Australia). The main information sources are reports from pathologists, haematologists and radiation oncologists, supplemented by death registrations, hospital statistical discharge (HMDS) records, and information from hospital files and responses to enquiries directed at treating medical practitioners.

The WACR has acted with the delegated authority of the Executive Director of Public Health with respect to the Health (Notification of Cancer) Regulations 1981, until the commencement of the new Health (Western Australian Cancer Register) Regulations 2011 on 10 June 2011. These Regulations 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 central nervous system (CNS) tumours, as well as a range of other neoplasms (see Appendix 2E). **The new Regulations and a summary of changes can be seen at**

http://www.health.wa.gov.au/wacr/home/regulations.cfm

1.2 General structure; how to find information

The major sections are based on cancers diagnosed, and deaths due to cancer, in 2011.

- Data for most common cancers are presented under headings based on incidence, mortality and age,
- Data for selected geographic areas are presented in Appendices 3D and 3E.
- Detailed data for all cancers for 2011 are found in the tables of Appendices 3A and 3B. The layout of those tables follows the coding system summarised in material available at www.health.wa.gov.au/wacr/home .

Readers seeking detailed information for particular cancers not shown in tables, should contact the Registry for further information.
Information from this report, and other WACR information, is available at -
http://www.health.wa.gov.au/wacr/statistics/stats_full.cfm

1.3 Interpretation

Western Australia is particularly polarised into metropolitan and rural areas, with huge differences in population density 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, readers should be aware that assessing the relevance of changes in cancer incidence and mortality is complex and depends on the size of underlying populations and their age structures. Caution is required in assessing changes on the basis of single rate comparisons.

The Cancer Registry database is continually updated in the light of the most recent available

information. Accordingly, numbers in this report for earlier years may vary slightly from those in previous publications, as some Western Australian cases are found to have been diagnosed elsewhere, or in earlier years, and case-counts necessarily rise and fall as new information arrives. Mortality information, in particular, often sheds new light on a person's cancer history.

As a guide, while total cancers for 2010 were quoted at 10942 in our previous report,[1] the total currently recorded for 2010 is 11261, an increase of about 2.9%. Mortality data are much more stable, but the benefits of more timely incidence reporting must be weighed against the apparent stability of the data as time passes.

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 groups and are calculated by dividing the numbers of cases by the population of the same sex and age group. Whole-population data come from the ABS and indigenous data from the Epidemiology Branch, Department of Health (WA).

Age-standardised rates (ASR in Tables) are calculated by the direct method, as a summation of weighted age-specific rates. Tables show the 95% confidence interval (c.i.) for ASRs. When a subset of age groups (e.g. 15-39 years) is considered, the term **age-adjusted rate** (AAR) is used instead of ASR.

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 Cumulative Risk are closely related. **Cumulative incidence** is an estimate of the proportion of 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.

Cumulative 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 cumulative **risks** may not be in proportion to one another because of differences in the age structures of populations.

2. Cancer in Western Australia, 2011

2.1 All cancers

2.1.1 Incidence

In 2011, there were 11636 new diagnoses of cancer in Western Australia, just over 6% more than reported a year ago for 2010. The all-cancers age-standardised rates, indicating risk, were not significantly changed in women. However in males, all-cancers incidence was higher, driven largely by 10% increase in case numbers, and an 8% increase in the ASR, for prostate cancer. There were 6671 cancers diagnosed in males (ASR 379.9 per 100,000) and 4965 in females (ASR 270.9) (Table 1). Cancers in males accounted for 57% of all cases.

The estimated cumulative 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) was 43% for males and 30% for females. These measures have remained essentially unchanged in recent years.

Cancer is generally more common in females than in males between ages 25 and 50 (mainly ovarian and breast cancers), but prostate cancer and lung cancer account for much of a male predominance in older ages.

The differences in cancer incidence rates across the age range can be seen for individual cancers and all cancers combined, in Appendix 3A.

2.1.2 Mortality

Among Western Australian residents in 2011 there were 3862 deaths due to cancer (2232 in males, 1630 in females) (Table 1). Mortality ASRs were 114 deaths per 100,000 males (slightly reduced since 2010) and 72 per 100,000 females (unchanged). The estimated cumulative risk of death due to cancer before age 75 years was 1 in 9 for males and 1 in 14 for females.

There was no significant change in the age-pattern of cancer mortality in 2011. Cancer death rates generally increased for both males and females from age 20. All-cancers death rates among males were consistently higher than in females at ages greater than 50 years.

These cancer deaths include 53 deaths due to non-melanoma skin cancers, 74% of them in males. Of these, 46 (87%) were due to squamous or basal cell carcinomas, types that are not included in "cancer" incidence statistics. The annual number of non-melanoma skin-cancer related deaths continues to increase.

Other deaths that are not counted in these "cancer" mortality statistics include –

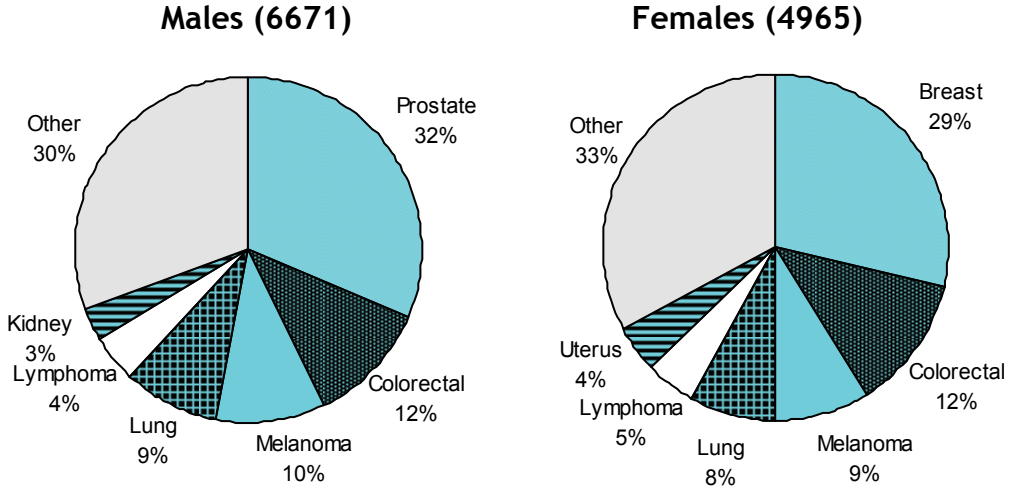
19 cancer-related deaths in persons not normally resident in Western Australia (13 Australian, 6 from overseas)
8 deaths due to benign tumours (all but 1 CNS tumours) (6 males, 2 female)
2 deaths due to "uncertain malignant potential" lymphohaematopoietic neoplasms
7 deaths due to "uncertain malignant potential" non-lymphohaematopoietic neoplasms
1820 deaths due to **non**-tumour-related causes among persons with a Registry tumour record (1032 males, 788 females)
20 deaths of unresolved cause among persons with a tumour record (pending outcome of coronial investigations).

2.2 Common cancers – Incidence and Mortality

The most common incident cancer types in males and females are shown in summary form in Figure 1, with the detailed statistics in Table 1. The recent reduction in prostate cancer incidence reported for 2010 has been reversed.

For further breakdown by age group, and including the less common cancer types, see Appendix 3A; for incidence statistics from different Regions within WA see Appendix 3D.

Figure 1. Cancer incidence, Western Australia, 2011: common cancers



The cancers most commonly causing mortality are shown in summary form in Figure 2, with the detailed statistics in Table 1. There have been only minor differences in the relative impact of these most common types in recent years. Lung cancer now appears firmly established as a more frequent cause of mortality in women than breast cancer, and continues to be the most common cause of cancer-related death in males.

For further breakdown by age group, and including the less common cancer types, see Appendix 3B; for mortality statistics from different Regions within WA see Appendix 3E.

Figure 2. Cancer mortality, Western Australia, 2011: common cancers

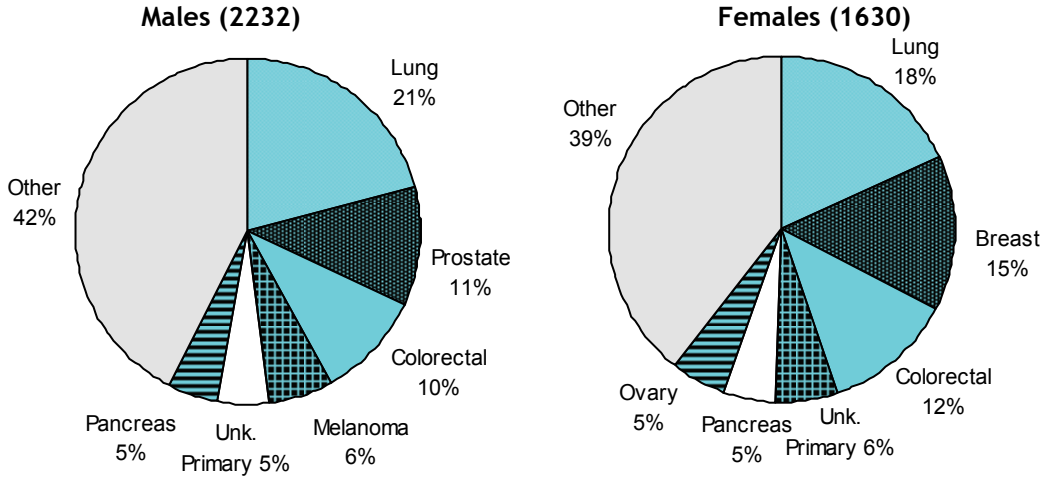


Table 1. Cancer incidence and mortality, Western Australia 2011: leading types in males and females

Incidence

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**2086**	31.3	**119.6**	114-125	7
Colorectal	**775**	11.6	**42.9**	39.8-46.0	21
Colon	**475**	7.1	**26.0**	23.6-28.4	34
Rectum	**299**	4.5	**16.9**	14.9-18.8	50
Melanoma (skin)	**672**	10.1	**38.8**	35.8-41.9	24
Lung	**595**	8.9	**31.1**	28.5-33.7	28
Lymphoma	**299**	4.5	**18.4**	16.2-20.6	53
Lymphoma NOS	**7**	0.1	**0.4**	0.1-0.7	2180
Hodgkin lymphoma	**38**	0.6	**3.0**	2.0-4.0	391
NHL	**254**	3.8	**15.0**	13.1-16.9	63
Kidney	**210**	3.1	**12.8**	11.0-14.6	67
Leukaemia	**192**	2.9	**11.9**	10.1-13.8	88
Leukaemia NOS	**5**	0.1	**0.3**	0.0-0.5	2443
Lymphoid leukaemia	**103**	1.5	**6.5**	5.1-7.8	162
Myeloid leukaemia	**84**	1.3	**5.2**	4.0-6.4	210
Leukaemia, other	**0**				
Bladder & urinary tract	**167**	2.5	**8.4**	7.1-9.7	109
Pancreas	**145**	2.2	**7.6**	6.3-8.8	121
Stomach	**137**	2.1	**7.4**	6.1-8.7	120
Unknown primary	**130**	1.9	**6.4**	5.3-7.6	176
Lip, gum & mouth	**108**	1.6	**6.7**	5.4-8.0	136
Brain	**97**	1.5	**6.4**	5.0-7.7	161
Myeloma	**95**	1.4	**5.2**	4.1-6.2	166
Oesophagus	**94**	1.4	**5.0**	4.0-6.1	175
Mesothelioma	**90**	1.3	**4.7**	3.7-5.7	178
Liver	**86**	1.3	**4.7**	3.7-5.7	196
Testis	**85**	1.3	**6.4**	5.0-7.8	210
Myelodysplastic diseases	**79**	1.2	**3.7**	2.9-4.5	341
Thyroid gland	**65**	1.0	**4.3**	3.2-5.4	267
Skin (NMSC exc. SCC/BCC)	**64**	1.0	**3.4**	2.5-4.2	313
All cancers	**6671**	100.0	**379.9**	371-389	3

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**1423**	28.7	**82.9**	78.5-87.4	11
Colorectal	**616**	12.4	**29.9**	27.4-32.5	29
Colon	**419**	8.4	**19.6**	17.6-21.7	45
Rectum	**191**	3.8	**10.0**	8.5-11.5	81
Melanoma (skin)	**443**	8.9	**25.2**	22.7-27.7	38
Lung	**407**	8.2	**19.9**	17.9-22.0	42
Lymphoma	**227**	4.6	**12.7**	10.9-14.5	74
Lymphoma NOS	**6**	0.1	**0.1**	0.0-0.3	*
Hodgkin lymphoma	**24**	0.5	**2.0**	1.2-2.8	636
NHL	**197**	4.0	**10.6**	9.0-12.2	84
Uterus	**216**	4.4	**11.8**	10.1-13.4	74
Thyroid gland	**184**	3.7	**12.5**	10.7-14.3	80
Leukaemia	**142**	2.9	**8.1**	6.6-9.6	117
Leukaemia NOS	**<5**	NR	**NR**	0 - 0.3	*
Lymphoid leukaemia	**71**	1.4	**4.5**	3.3-5.7	208
Myeloid leukaemia	**68**	1.4	**3.5**	2.6-4.4	269
Leukaemia, other	**<5**	NR	**NR**		
Ovary	**133**	2.7	**7.3**	6.0-8.6	124
Unknown primary	**116**	2.3	**4.6**	3.7-5.6	253
Kidney	**108**	2.2	**6.5**	5.2-7.9	138
Pancreas	**100**	2.0	**4.6**	3.7-5.6	182
Myeloma	**72**	1.5	**3.5**	2.6-4.3	230
Cervix	**71**	1.4	**4.6**	3.5-5.8	230
Brain	**66**	1.3	**4.0**	3.0-5.1	246
Bladder & urinary tract	**65**	1.3	**2.7**	2.0-3.4	321
Stomach	**64**	1.3	**3.0**	2.2-3.9	278
Lip, gum & mouth	**47**	0.9	**2.4**	1.7-3.2	348
Gallbladder / bile ducts	**44**	0.9	**1.9**	1.3-2.5	539
Skin (NMSC exc. SCC/BCC)	**40**	0.8	**2.1**	1.4-2.8	347
Vulva	**40**	0.8	**1.9**	1.3-2.6	534
All cancers	**4965**	100.0	**270.9**	263-279	4

Mortality

Males

	Cases	%	ASR	95%c.i.	Risk
Lung	**462**	20.7	**23.5**	21.3-25.7	39
Prostate	**253**	11.3	**11.1**	9.7-12.5	144
Colorectal	**224**	10.0	**11.5**	9.9-13.0	85
Colon	**142**	6.4	**7.1**	5.9-8.3	144
Rectum	**82**	3.7	**4.4**	3.4-5.3	208
Melanoma (skin)	**134**	6.0	**6.9**	5.7-8.1	158
Unknown primary	**105**	4.7	**5.3**	4.2-6.3	201
Pancreas	**104**	4.7	**5.4**	4.3-6.4	188
Stomach	**92**	4.1	**4.7**	3.7-5.7	228
Mesothelioma	**85**	3.8	**4.2**	3.3-5.1	224
Bladder & urinary tract	**85**	3.8	**4.0**	3.1-4.9	296
Leukaemia	**83**	3.7	**4.4**	3.4-5.4	242
Leukaemia NOS	**<5**	NR	**NR**	0 - 0.4	2785
Lymphoid leukaemia	**35**	1.6	**1.8**	1.1-2.4	588
Myeloid leukaemia	**45**	2.0	**2.4**	1.7-3.2	482
Leukaemia, other	**<5**	NR	**NR**		-
Brain	**75**	3.4	**4.6**	3.5-5.6	212
Oesophagus	**73**	3.3	**4.0**	3.1-5.0	213
Liver	**64**	2.9	**3.5**	2.6-4.4	243
Lymphoma	**60**	2.7	**3.0**	2.2-3.9	345
Lymphoma NOS	**<5**	NR	**NR**	0 - 0.2	6653
Hodgkin lymphoma	**NR**	NR	**NR**	0 - 0.6	3457
NHL	**53**	2.4	**2.6**	1.9-3.3	407
Kidney	**46**	2.1	**2.6**	1.8-3.4	301
Myeloma	**41**	1.8	**2.1**	1.4-2.7	442
Skin (NMSC inc. SCC/BCC)	**39**	1.7	**1.8**	1.2-2.4	892
Myelodysplastic diseases	**31**	1.4	**1.4**	0.9-2.0	861
Pharynx	**30**	1.3	**1.7**	1.1-2.3	507
Gallbladder / bile ducts	**28**	1.3	**1.4**	0.8-1.9	844
All cancer deaths	**2232**	100.0	**113.7**	109-119	9

Females

	Cases	%	ASR	95%c.i.	Risk
Lung	**294**	18.0	**13.5**	11.9-15.2	63
Breast	**238**	14.6	**11.9**	10.3-13.5	77
Colorectal	**197**	12.1	**7.6**	6.5-8.8	143
Colon	**141**	8.7	**5.3**	4.4-6.3	206
Rectum	**56**	3.4	**2.3**	1.6-3.0	464
Unknown primary	**95**	5.8	**3.4**	2.6-4.1	379
Pancreas	**82**	5.0	**3.5**	2.7-4.4	237
Ovary	**81**	5.0	**4.0**	3.1-5.0	208
Lymphoma	**75**	4.6	**3.0**	2.3-3.8	340
Lymphoma NOS	**<5**	0.1	**0.0**	0 - 0.1	*
Hodgkin lymphoma	**NR**	0.4	**0.4**	0.1-0.8	2267
NHL	**67**	4.1	**2.5**	1.9-3.2	400
Leukaemia	**66**	4.0	**2.7**	2.0-3.5	410
Leukaemia NOS	**<5**	NR	**NR**	0 - 0.1	*
Lymphoid leukaemia	**16**	1.0	**0.7**	0.3-1.1	2193
Myeloid leukaemia	**48**	2.9	**2.0**	1.4-2.6	504
Leukaemia, other	**<5**	NR	**NR**		-
Brain	**52**	3.2	**2.8**	2.0-3.6	320
Melanoma (skin)	**46**	2.8	**2.0**	1.4-2.6	575
Stomach	**42**	2.6	**1.7**	1.1-2.3	603
Uterus	**39**	2.4	**1.8**	1.2-2.4	526
Myeloma	**34**	2.1	**1.4**	0.9-1.9	661
Bladder & urinary tract	**30**	1.8	**1.2**	0.7-1.7	704
Gallbladder / bile ducts	**29**	1.8	**1.1**	0.6-1.5	1216
Myelodysplastic diseases	**28**	1.7	**1.0**	0.6-1.4	1463
Liver	**25**	1.5	**1.2**	0.7-1.7	639
Cervix	**23**	1.4	**1.4**	0.8-1.9	591
Kidney	**23**	1.4	**1.0**	0.6-1.5	1053
Oesophagus	**16**	1.0	**0.6**	0.3-0.9	2549
Skin (NMSC inc. SCC/BCC)	**14**	0.9	**0.6**	0.2-0.9	1352
All cancer deaths	**1630**	100.0	**72.2**	68.3-76.0	14

*(NHL - Non-Hodgkin lymphoma; Refer to **Statistical Methods**, Section 1.4, for other terms & abbreviations used)*

2.3 Cancer in different age groups

2.3.1 Cancer in children

Incidence: In children under the age of 15 years, there were 81 cases of cancer diagnosed in 2011, 44 males and 37 females. The most common types were leukaemias (24 cases), lymphomas (12) and brain tumours (7). Incidence rates were increased from the relatively-low rates reported for recent years but the change was within the usual limits of statistical variability.

Numbers and rates by age group are in Appendix 3A and Appendix 3B. The International Classification of Childhood Cancer (Version 3) table based on major diagnostic groups based primarily on tumour morphology is found in Appendix 3C. This classification includes a further 8 "uncertain malignant potential" brain tumours not included in "cancer" statistics.

2.3.2 Cancer in the 15-39 years age range

In the 15 to 39 years age range, there were 605 cancer diagnoses in 2011, 3% fewer than in 2010 but similar to data for 2009. There were 62 cancer-related deaths in this age group in 2011, 10% fewer than in 2010, but again similar to data for 2009. The most common types are shown in summary form in Figures 3 and 4, with the detailed statistics in Table 2 and 3.

Figure 3. Cancer incidence, Western Australia, 2011: common cancers in the 15 to 39 years age group

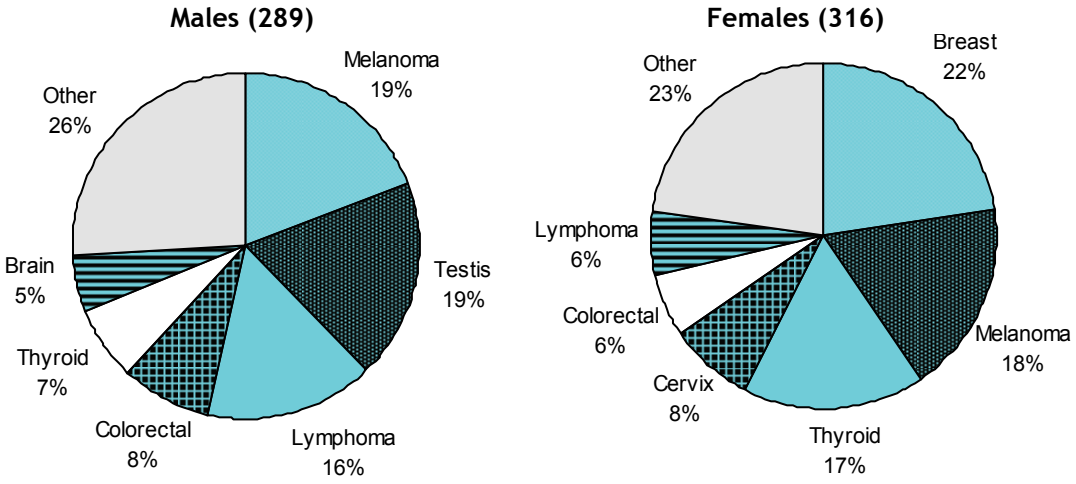
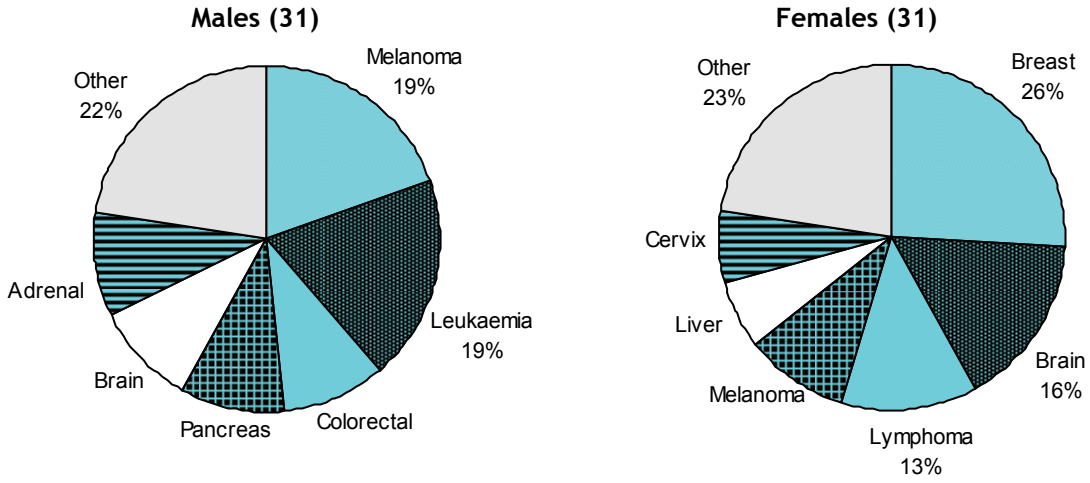


Figure 4. Cancer mortality, Western Australia, 2011: common cancers in the 15 to 39 years age group



2.3.3 Cancer in the 40-64 years age range

There were 4687 new cancer cases in the age range 40 to 64 years, prostate and breast most common, with an overall risk of cancer occurring in this age range of 1 in 6 for males and 1 in 7 for females, with slight reductions in overall incidence rates since 2010. There were 980 cancer-related deaths in this age range, with mortality rates relatively unchanged in males and females.

The most common types are shown in summary form in Figures 5 and 6, with the detailed statistics in Table 2 and 3.

Figure 5. Cancer incidence, Western Australia, 2011: common cancers in the 40 to 64 years age group

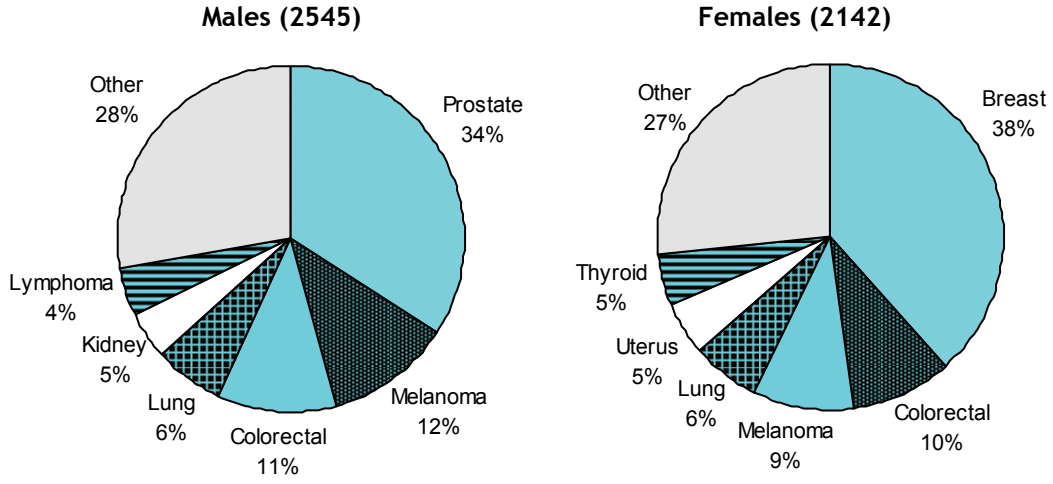
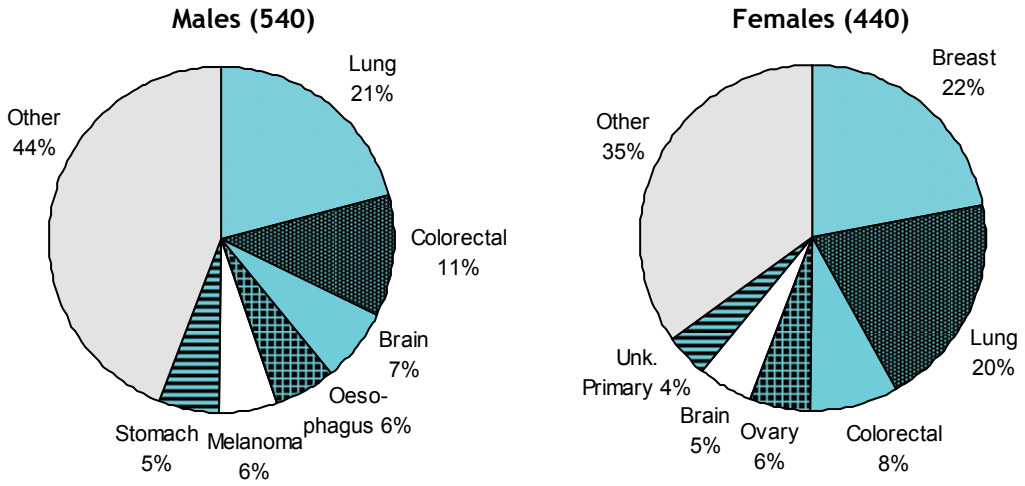


Figure 6. Cancer mortality, Western Australia, 2011: common cancers in the 40 to 64 years age group



2.3.4 Cancer in persons aged 65 and over

There were 6263 new cancer diagnoses in persons over the age of 65 years in 2011. In this age range, prostate cancer (1216 cases) outnumbered any other specific cancer type in either sex (Table 2) and accounted for 32% of diagnoses in males. Case numbers increased since 2010 by 15% in this age range. Overall male incidence rates in this age group were higher than in 2010, while rates in females were hardly changed in comparison. Among females, breast cancer predominated (530 cases, 21.5%).

There were 2809 cancer-related deaths in this age range in 2011, showing little change since 2010. Over the age of 65 years, lung cancer was the most common cause of cancer-related death, causing 555 deaths, 10% fewer than in 2010.

The most common types are shown in summary form in Figures 7 and 8, with the detailed statistics in Table 2 and 3.

Figure 7. Cancer incidence, Western Australia, 2011: common cancers in the 65 years & over age group

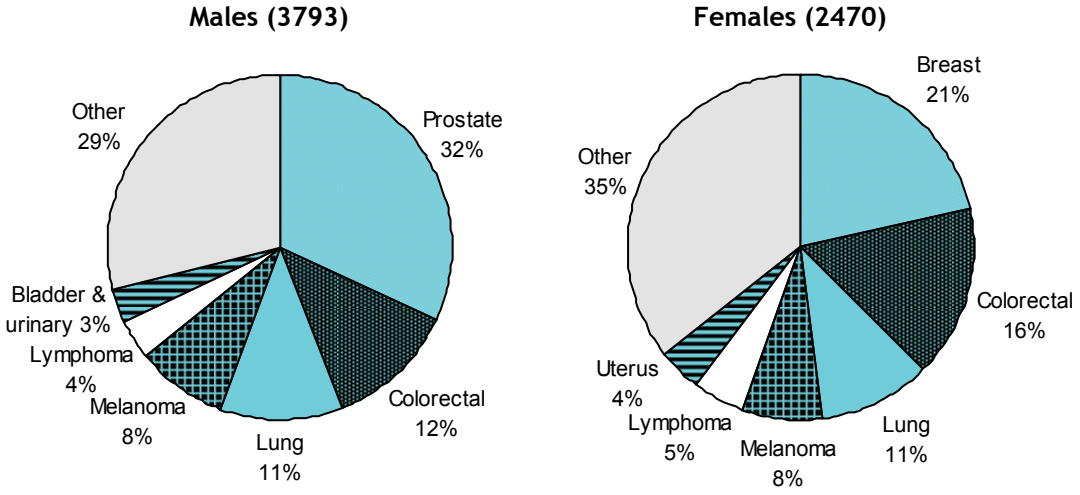


Figure 8. Cancer mortality, Western Australia, 2011: common cancers in the 65 years & over age group

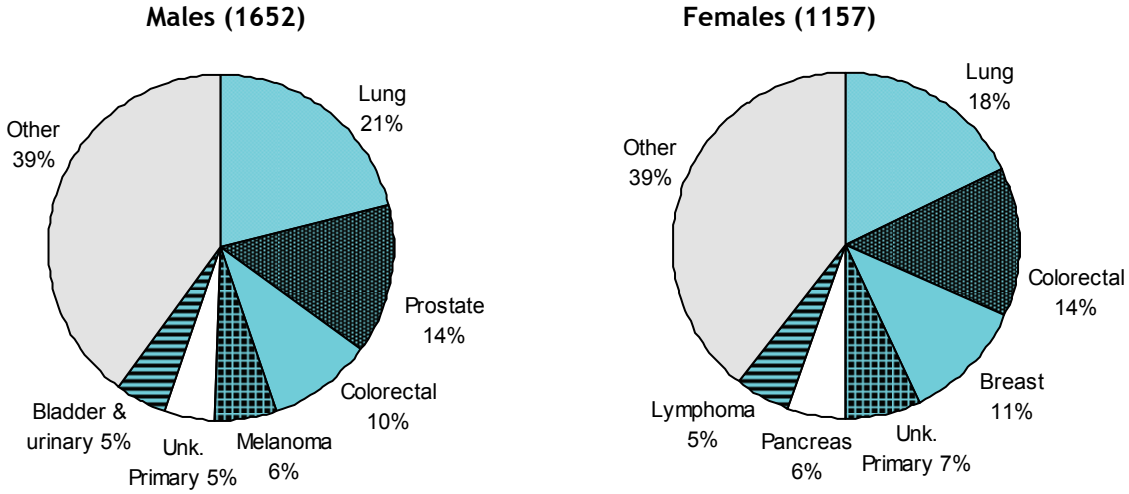


Table 2. Cancer incidence, Western Australia, 2011: leading types by sex and age group (ASR: age-adjusted rate)

15 to 39 years

Males

	Cases	%	ASR	95%c.i.	Risk
Melanoma (skin)	**55**	19.0	**11.3**	8.3-14.2	321
Testis	**54**	18.7	**11.9**	8.7-15.1	333
Lymphoma	**46**	15.9	**10.3**	7.3-13.3	384
Lymphoma NOS	**0**				
Hodgkin lymphoma	**21**	7.3	**4.9**	2.8-7.0	840
NHL	**25**	8.7	**5.4**	3.2-7.5	708
Colorectal	**24**	8.3	**5.0**	3.0-7.0	733
Colon	**18**	6.2	**3.7**	2.0-5.5	970
Rectum	**6**	2.1	**1.3**	0.2-2.3	2998
Thyroid gland	**20**	6.9	**4.3**	2.4-6.3	883
Brain	**15**	5.2	**3.2**	1.5-4.8	1172
Lip, gum & mouth	**14**	4.8	**3.0**	1.4-4.6	1228
Leukaemia	**11**	3.8	**2.4**	1.0-3.9	1549
Leukaemia NOS	**0**				
Lymphoid leukaemia	**5**	1.7	**1.1**	0.1-2.1	3407
Myeloid leukaemia	**6**	2.1	**1.3**	0.2-2.4	2841
Leukaemia, other	**0**				
All cancers	**289**	100.0	**61.9**	54.7-69.1	61

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**71**	22.5	**14.4**	11.1-17.8	235
Melanoma (skin)	**57**	18.0	**12.1**	8.9-15.2	295
Thyroid gland	**54**	17.1	**11.4**	8.3-14.5	309
Cervix	**25**	7.9	**5.2**	3.2-7.3	671
Colorectal	**19**	6.0	**4.1**	2.2-5.9	873
Colon	**14**	4.4	**3.0**	1.4-4.7	1181
Rectum	**5**	1.6	**1.0**	0.1-1.9	3341
Lymphoma	**18**	5.7	**4.2**	2.2-6.1	925
Lymphoma NOS	**0**				
Hodgkin lymphoma	**9**	2.8	**2.3**	0.8-3.8	1845
NHL	**9**	2.8	**1.9**	0.6-3.1	1854
Ovary	**10**	3.2	**2.1**	0.8-3.4	1665
Leukaemia	**10**	3.2	**2.3**	0.9-3.7	1674
Leukaemia NOS	**<5**	NR	**NR**	0 - 0.7	*
Lymphoid leukaemia	**<5**	NR	**NR**	0 - 0.7	*
Myeloid leukaemia	**8**	2.5	**1.8**	0.5-3.1	2066
Leukaemia, other	**<5**	NR	**NR**		
All cancers	**316**	100.0	**67.1**	59.6-74.5	53

40 to 64 years

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**867**	34.1	**214.7**	200-229	16
Melanoma (skin)	**297**	11.7	**75.5**	66.9-84.2	49
Colorectal	**287**	11.3	**72.3**	63.9-80.7	50
Colon	**151**	5.9	**38.1**	32.0-44.1	94
Rectum	**136**	5.3	**34.2**	28.5-40.0	105
Lung	**162**	6.4	**40.2**	34.0-46.4	85
Kidney	**115**	4.5	**29.0**	23.7-34.3	127
Lymphoma	**110**	4.3	**27.6**	22.4-32.7	131
Lymphoma NOS	**<5**	NR	**0.5**	0 - 1.2	6323
Hodgkin lymphoma	**NR**	0.4	**2.5**	1.0-4.1	1481
NHL	**98**	3.9	**24.5**	19.7-29.4	147
Leukaemia	**67**	2.6	**17.0**	12.9-21.1	219
Leukaemia NOS	**0**				
Lymphoid leukaemia	**34**	1.3	**8.5**	5.7-11.4	427
Myeloid leukaemia	**33**	1.3	**8.5**	5.6-11.4	449
Leukaemia, other	**0**				
Lip, gum & mouth	**49**	1.9	**12.7**	9.2-16.3	298
All cancers	**2545**	100.0	**638.6**	614-663	6

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**822**	38.4	**212.9**	198-227	18
Colorectal	**204**	9.5	**50.8**	43.8-57.7	70
Colon	**125**	5.8	**31.0**	25.6-36.5	113
Rectum	**79**	3.7	**19.8**	15.4-24.1	182
Melanoma (skin)	**199**	9.3	**51.5**	44.4-58.7	75
Lung	**139**	6.5	**34.8**	29.0-40.6	100
Uterus	**105**	4.9	**26.4**	21.4-31.5	136
Thyroid gland	**99**	4.6	**26.3**	21.1-31.5	158
Lymphoma	**90**	4.2	**23.2**	18.4-28.0	161
Lymphoma NOS	**0**				
Hodgkin lymphoma	**12**	0.6	**3.3**	1.4-5.1	1278
NHL	**78**	3.6	**19.9**	15.5-24.3	184
Kidney	**58**	2.7	**14.7**	10.9-18.5	249
Ovary	**51**	2.4	**13.1**	9.5-16.7	280
Leukaemia	**41**	1.9	**10.4**	7.2-13.6	342
All cancers	**2142**	100.0	**549.0**	526-572	7

65 years and over

Males

	Cases	%	ASR	95%c.i.	Risk
Prostate	**1216**	32.1	**937.7**	884-992	11
Colorectal	**464**	12.2	**328.7**	298-360	36
Colon	**306**	8.1	**215.9**	191-241	56
Rectum	**157**	4.1	**111.8**	93.8-130	99
Lung	**431**	11.4	**298.9**	270-328	42
Melanoma (skin)	**319**	8.4	**223.6**	198-249	54
Lymphoma	**136**	3.6	**96.6**	79.8-113	121
Lymphoma NOS	**5**	0.1	**3.5**	0.4-6.7	3327
Hodgkin lymphoma	**5**	0.1	**3.9**	0.4-7.5	1787
NHL	**126**	3.3	**89.1**	73.0-105	135
Bladder & urinary tract	**130**	3.4	**86.5**	71.1-102	155
Pancreas	**101**	2.7	**68.6**	54.7-82.5	193
Leukaemia	**100**	2.6	**68.7**	54.7-82.7	190
Leukaemia NOS	**5**	0.1	**3.7**	0.3-7.0	2443
Lymphoid leukaemia	**55**	1.5	**37.7**	27.3-48.1	335
Myeloid leukaemia	**40**	1.1	**27.3**	18.6-36.1	532
Leukaemia, other	**0**				
All cancers	**3793**	100.0	**2733.1**	2644-2822	5

Females

	Cases	%	ASR	95%c.i.	Risk
Breast	**530**	21.5	**347.8**	316-380	28
Colorectal	**393**	15.9	**225.0**	201-249	51
Colon	**280**	11.3	**153.8**	134-174	79
Rectum	**107**	4.3	**66.8**	53.2-80.5	151
Lung	**265**	10.7	**156.5**	136-177	74
Melanoma (skin)	**187**	7.6	**112.5**	94.8-130	100
Lymphoma	**114**	4.6	**67.9**	54.4-81.4	169
Lymphoma NOS	**NR**	NR	**NR**	0.4-3.8	*
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 2.8	9067
NHL	**107**	4.3	**64.9**	51.5-78.2	173
Uterus	**106**	4.3	**68.5**	54.4-82.6	168
Unknown primary	**89**	3.6	**40.3**	31.0-49.5	495
Leukaemia	**81**	3.3	**45.2**	34.4-56.0	227
Leukaemia NOS	**<5**	NR	**NR**	0 - 1.5	*
Lymphoid leukaemia	**40**	1.6	**24.0**	15.9-32.1	377
Myeloid leukaemia	**39**	1.6	**20.6**	13.5-27.7	570
Leukaemia, other	**<5**	NR	**NR**		
All cancers	**2470**	100.0	**1477.8**	1415-1541	8

Table 3. Cancer mortality, Western Australia, 2011: leading types by sex and age group (ASR: age-adjusted rate)

15 to 39 years

Males

	Deaths	%	ASR	95%c.i.	Risk
Melanoma (skin)	**6**	19.4	**1.2**	0.2-2.2	2953
Leukaemia	**6**	19.4	**1.3**	0.2-2.3	2993
Leukaemia NOS	**<5**	3.2	**NR**	0 - 0.6	*
Lymphoid leukaemia	**<5**	3.2	**NR**	0 - 0.7	*
Myeloid leukaemia	**<5**	12.9	**NR**	0.0-1.6	4522
Leukaemia, other	**0**				-
Colorectal	**<5**	9.7	**NR**	0 - 1.2	5682
Colon	**<5**	6.5	**NR**	0 - 0.9	8510
Rectum	**<5**	3.2	**NR**	0 - 0.6	*
Pancreas	**<5**	9.7	**NR**	0 - 1.2	5682
Brain	**<5**	9.7	**NR**	0 - 1.6	5769
Adrenal gland	**<5**	9.7	**NR**	0 - 1.4	6169
All cancer deaths	**31**	100.0	**6.4**	4.1-8.7	568

Females

	Deaths	%	ASR	95%c.i.	Risk
Breast	**8**	25.8	**1.6**	0.5-2.7	2093
Brain	**5**	16.1	**1.0**	0.1-1.8	3319
Lymphoma	**<5**	12.9	**NR**	0.0-1.7	4288
Lymphoma NOS	**0**				-
Hodgkin lymphoma	**<5**	6.5	**NR**	0 - 1.2	8830
NHL	**<5**	6.5	**NR**	0 - 0.9	8334
Melanoma (skin)	**<5**	9.7	**NR**	0 - 1.3	5514
Liver	**<5**	6.5	**NR**	0 - 0.9	8334
Cervix	**<5**	6.5	**NR**	0 - 0.9	8239
All cancer deaths	**31**	100.0	**6.3**	4.1-8.6	540

40 to 64 years

Males

	Deaths	%	ASR	95%c.i.	Risk
Lung	**113**	20.9	**28.0**	22.9-33.2	123
Colorectal	**61**	11.3	**15.2**	11.4-19.1	223
Colon	**35**	6.5	**8.7**	5.8-11.6	383
Rectum	**26**	4.8	**6.5**	4.0-9.0	536
Brain	**38**	7.0	**9.6**	6.6-12.7	370
Oesophagus	**30**	5.6	**7.6**	4.9-10.3	482
Melanoma (skin)	**30**	5.6	**7.6**	4.9-10.3	485
Stomach	**29**	5.4	**7.5**	4.7-10.2	501
Pancreas	**27**	5.0	**6.8**	4.2-9.4	523
Liver	**26**	4.8	**6.6**	4.0-9.1	563
Prostate	**24**	4.4	**5.9**	3.5-8.2	565
Unknown primary	**23**	4.3	**5.7**	3.4-8.0	598
Pharynx	**14**	2.6	**3.5**	1.7-5.4	994
Lymphoma	**14**	2.6	**3.4**	1.6-5.2	981
Lymphoma NOS	**<5**	NR	**NR**		-
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 0.7	*
NHL	**13**	2.4	**3.2**	1.4-4.9	1055
All cancer deaths	**540**	100.0	**135.2**	124-147	26

Females

	Deaths	%	ASR	95%c.i.	Risk
Breast	**97**	22.0	**24.9**	20.0-29.9	152
Lung	**87**	19.8	**21.6**	17.1-26.2	162
Colorectal	**37**	8.4	**9.4**	6.4-12.4	387
Colon	**27**	6.1	**6.8**	4.2-9.4	528
Rectum	**10**	2.3	**2.6**	1.0-4.1	1450
Ovary	**25**	5.7	**6.3**	3.8-8.8	565
Brain	**23**	5.2	**5.7**	3.3-8.0	625
Unknown primary	**17**	3.9	**4.3**	2.2-6.3	829
Pancreas	**15**	3.4	**3.7**	1.8-5.6	890
Uterus	**14**	3.2	**3.5**	1.7-5.3	1000
Lymphoma	**14**	3.2	**3.5**	1.7-5.4	1009
Lymphoma NOS	**<5**	NR	**NR**		-
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 1.7	4594
NHL	**11**	2.5	**2.7**	1.1-4.3	1293
Melanoma (skin)	**13**	3.0	**3.3**	1.5-5.2	1137
Cervix	**13**	3.0	**3.4**	1.5-5.2	1162
Leukaemia	**13**	3.0	**3.3**	1.5-5.2	1064
All cancer deaths	**440**	100.0	**111.2**	101-122	33

65 years and over

Males

	Deaths	%	ASR	95%c.i.	Risk
Lung	**348**	21.1	**234.4**	209-260	57
Prostate	**229**	13.9	**137.8**	119-156	192
Colorectal	**160**	9.7	**106.7**	89.5-124	140
Colon	**105**	6.4	**68.4**	54.8-82.0	235
Rectum	**55**	3.3	**38.2**	27.8-48.6	346
Melanoma (skin)	**98**	5.9	**64.4**	51.2-77.6	253
Unknown primary	**80**	4.8	**52.0**	40.2-63.8	314
Bladder & urinary tract	**76**	4.6	**49.2**	37.7-60.6	365
Mesothelioma	**75**	4.5	**51.4**	39.3-63.4	268
Pancreas	**74**	4.5	**49.5**	37.8-61.2	309
Stomach	**62**	3.8	**39.7**	29.5-50.0	429
Leukaemia	**61**	3.7	**39.4**	29.1-49.7	374
Leukaemia NOS	**<5**	NR	**NR**	0 - 4.1	3327
Lymphoid leukaemia	**28**	1.7	**17.4**	10.6-24.2	815
Myeloid leukaemia	**31**	1.9	**20.2**	12.9-27.6	873
Leukaemia, other	**<5**	NR	**NR**		-
Lymphoma	**45**	2.7	**29.4**	20.5-38.3	552
All cancer deaths	**1652**	100.0	**1089.3**	1035-1143	14

Females

	Deaths	%	ASR	95%c.i.	Risk
Lung	**207**	17.9	**115.9**	98.5-133	102
Colorectal	**159**	13.7	**74.7**	61.7-87.6	229
Colon	**114**	9.9	**52.0**	41.3-62.7	337
Rectum	**45**	3.9	**22.7**	15.4-30.0	712
Breast	**133**	11.5	**72.1**	58.4-85.8	167
Unknown primary	**78**	6.7	**32.8**	24.8-40.8	696
Pancreas	**67**	5.8	**37.2**	27.4-46.9	323
Lymphoma	**57**	4.9	**26.0**	18.5-33.5	581
Lymphoma NOS	**<5**	NR	**NR**	0 - 1.5	*
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 2.8	9067
NHL	**54**	4.7	**24.4**	17.2-31.7	621
Ovary	**55**	4.8	**33.6**	23.8-43.3	336
Leukaemia	**52**	4.5	**24.6**	17.2-32.0	696
Leukaemia NOS	**<5**	NR	**NR**	0 - 1.5	*
Lymphoid leukaemia	**13**	1.1	**5.6**	2.2-9.0	3958
Myeloid leukaemia	**37**	3.2	**18.3**	11.9-24.8	844
Leukaemia, other	**<5**	NR	**NR**		-
All cancer deaths	**1157**	100.0	**596.1**	558-634	24

2.4 Cancer incidence trends 2002-2011

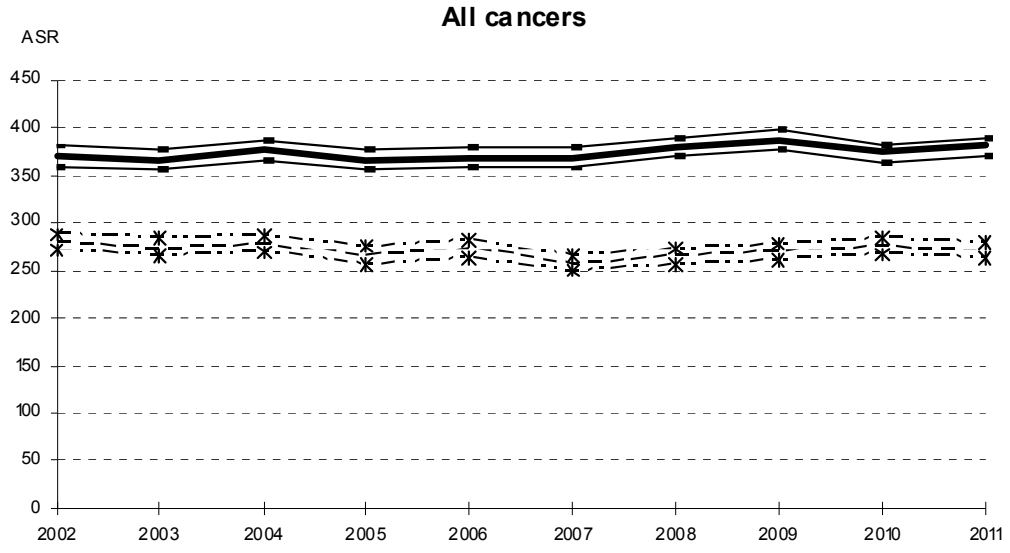
In this section, line graphs are presented for several cancer types to illustrate how incidence rates have changed over time, and how they differ between males and females. In each graph, the central line for each sex (bold and solid for males, dashed for females) indicates the trend in the age-standardised rate (ASR) and the associated statistical uncertainty (95% confidence interval) is indicated by a pair of accompanying lines with markers. The relative width of the confidence intervals is generally smaller for the most common conditions – for example, "All cancers" (Figure 9). Changes in the reported incidence of any disease may be due to a combination of technical issues such as the completeness and timeliness of data provision, and actual disease occurrence which may be due to changes in risk factors in the recent or more distant past, or changes in detection methods.

Trends that may reflect changes in smoking prevalence include decreasing incidence of lung and laryngeal cancers in males, while incidence increases in females. Changes are not so clear for bladder and urinary tract cancers.

Prostate cancer incidence has long been increasing but recent data suggest a reversal that may be confirmed with more recent data. Breast cancer incidence among women appears stable or increasing. Colorectal cancer incidence shows a slight downward trend and for melanoma the decrease in recent years is marked in both sexes.

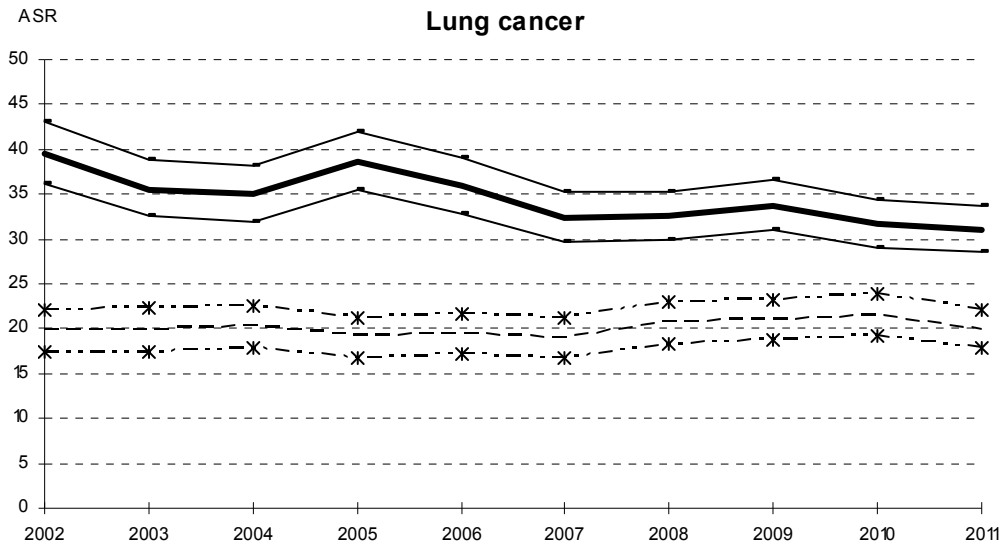
Thyroid cancer, unusual in that incidence in females is higher than among males, appears to be increasing in both sexes, consistent with a long-established world-wide trend[4] that may result from increased surveillance and detection, or other factors including radiation or hormonal factors. Cancers of unknown primary site were stable or decreasing, indicating ongoing success in confirming the details of initial reports.

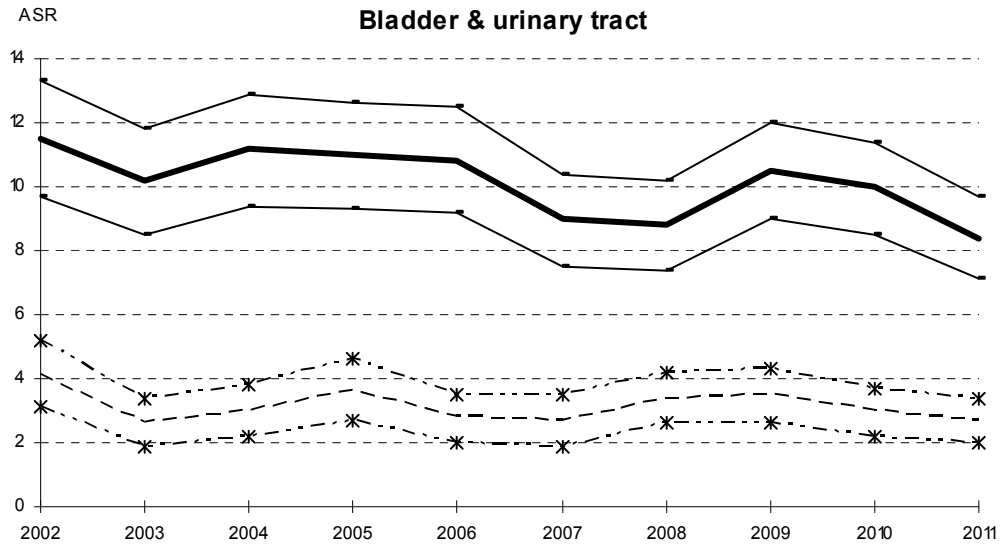
Figure 9. Cancer incidence, WA, 2002-2011: trends for selected cancers



(_____ Males, __ __ __ __ Females)

Figure 9 (cont.) Cancer incidence, WA, 2002-2011: trends for selected cancers





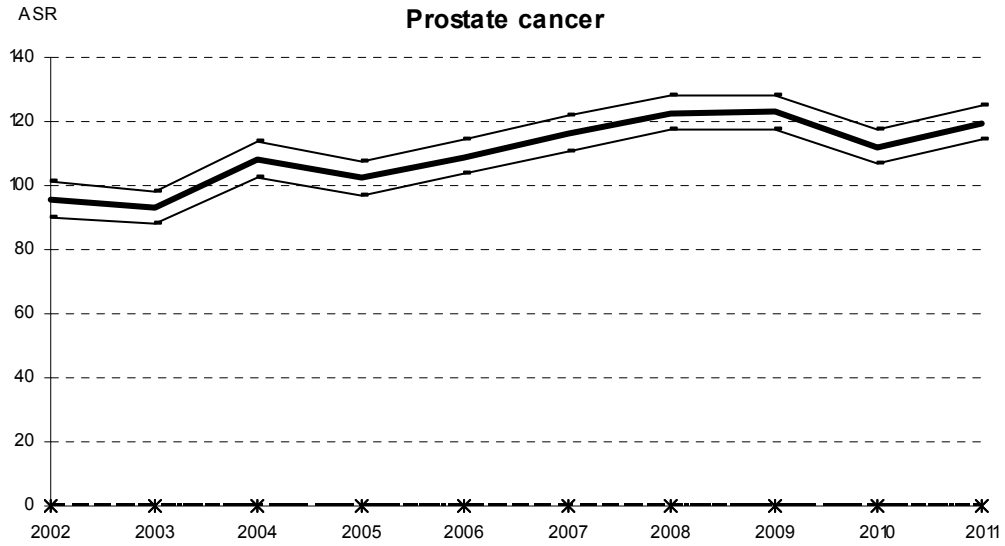
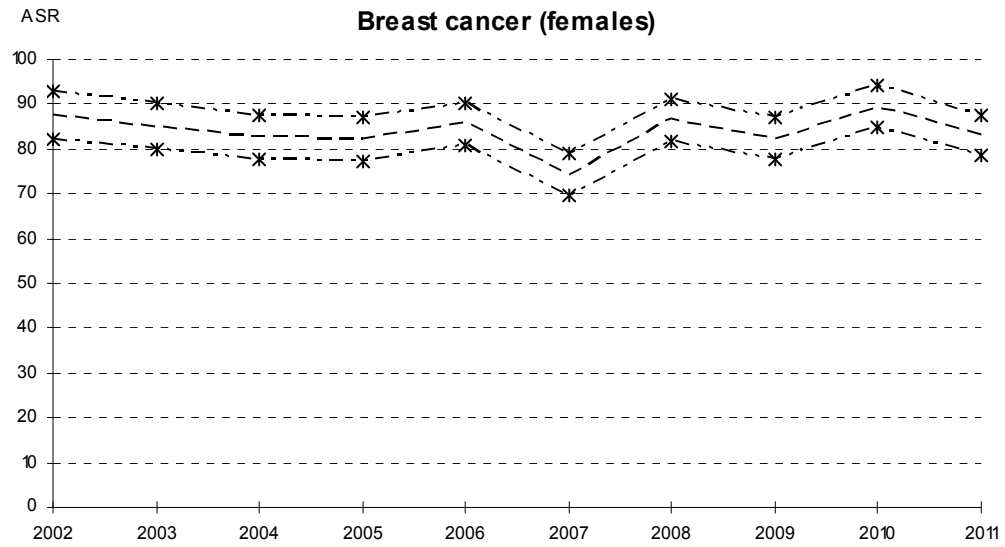
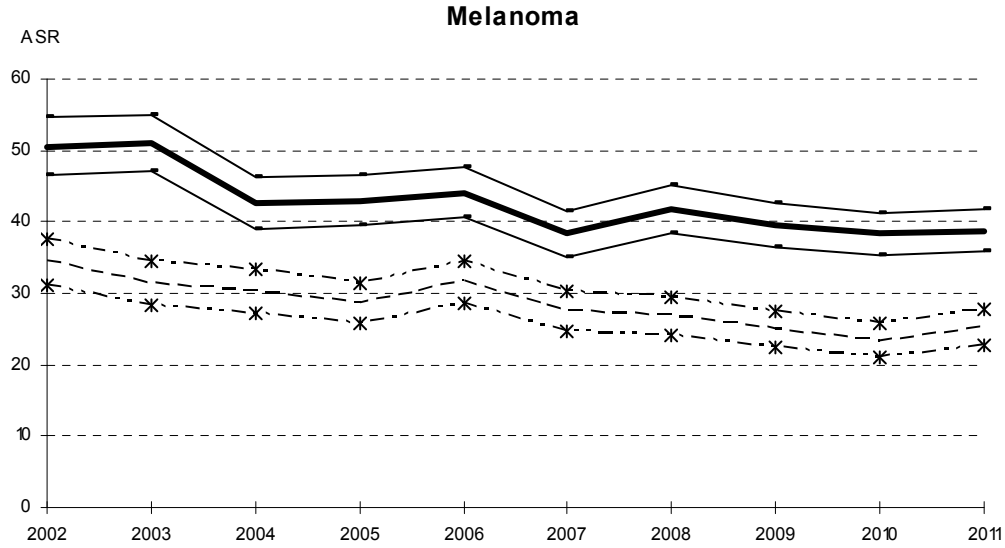
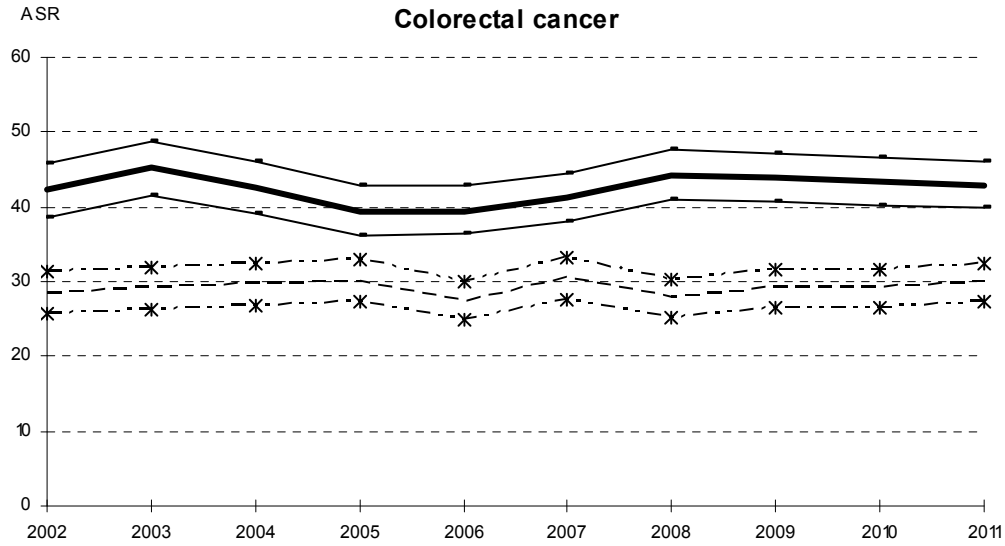


Figure 9 (cont.) Cancer incidence, WA, 2002-2011: trends for selected cancers







2.5 Changes in size distribution of skin melanomas, 2000-2011

Changes in age at diagnosis and in the size distribution of melanoma have always been of interest, as they may reflect changes in health promotion activity and behaviour relating to sun exposure. Rates have traditionally been higher in males in association with a historical male predominance among outdoor workers.

The Clark level[4] is frequently-used descriptive measure of the vertical extent of a melanoma though the anatomical layers of the skin; this and a numeric measure, the Breslow thickness[5] in millimetres, are both used widely, and routinely included in pathology reports. A Clark level of I and Breslow thickness of 0 are used for tumours that are confined to the most superficial layer of the skin and are not regarded as "invasive" but as "*in situ*".

There were 1115 new cases of invasive skin melanoma recorded in Western Australians in 2011; 672 (60%) in males and 443 (40%) in females. There were an additional 174 new melanomas diagnosed in people who had already had one previously. In the same period there were 1506 *in situ* melanomas, including 243 in persons who had previously had an *in situ* melanoma. Of the 1449 individuals with an *in situ* melanoma in 2011, 225 had had a previous invasive melanoma diagnosis, and 39 had a concurrent or subsequent invasive melanoma diagnosis.

Over the period 2000 to 2011, the proportion of cases in the highest Clark level category increased, more so in males than in females (Table 4).

Table 4. Melanoma, Western Australia, 2000-2011: Clark level by sex and diagnosis period.

MALES	Years					
Clark	2000-2003		2004-2007		2008-2011	
Level	Cases	**(%)**	Cases	**(%)**	Cases	**(%)**
II	877	**38.5**	803	**35.1**	817	**32.4**
III	508	**22.3**	533	**23.3**	600	**23.8**
IV	752	**33.0**	779	**34.0**	918	**36.5**
V	70	**3.1**	88	**3.8**	110	**4.4**
Unknown	69	**3.0**	85	**3.7**	73	**2.9**
All	2276	**(100)**	2288	**(100)**	2518	**(100)**

FEMALES	Years					
Clark	2000-2003		2004-2007		2008-2011	
Level	Cases	**(%)**	Cases	**(%)**	Cases	**(%)**
II	621	**38.9**	561	**34.1**	547	**34.2**
III	365	**22.9**	384	**23.4**	412	**25.8**
IV	520	**32.6**	579	**35.2**	531	**33.2**
V	54	**3.4**	60	**3.7**	65	**4.1**
Unknown	37	**2.3**	59	**3.6**	45	**2.8**
All	1597	**(100)**	1643	**(100)**	1600	**(100)**

The Breslow thickness measures show a similar trend with an increasing proportion in the highest category, in both males and females (Table 5), with mean and median also increasing over time (Table 6).

Table 5. Melanoma, Western Australia, 2000-2011: Breslow thickness by sex and diagnosis period.

MALES	Years					
Breslow thickness	2000-2003		2004-2007		2008-2011	
	Cases	(%)	Cases	(%)	Cases	(%)
0 - 0.49 mm	801	**35.2**	698	**30.5**	692	**27.5**
0.5 - 0.99 mm	724	**31.8**	747	**32.6**	853	**33.9**
1.0 - 1.99 mm	345	**15.2**	372	**16.3**	422	**16.8**
>= 2.00 mm	340	**14.9**	391	**17.1**	486	**19.3**
Unknown	66	**2.9**	80	**3.5**	65	**2.6**
All	2276	**(100)**	2288	**(100)**	2518	**(100)**

FEMALES	Years					
Breslow thickness	2000-2003		2004-2007		2008-2011	
	Cases	(%)	Cases	(%)	Cases	(%)
0 - 0.49 mm	568	**35.6**	530	**32.3**	497	**31.1**
0.5 - 0.99 mm	518	**32.4**	537	**32.7**	562	**35.1**
1.0 - 1.99 mm	290	**18.2**	305	**18.6**	260	**16.3**
>= 2.00 mm	187	**11.7**	220	**13.4**	244	**15.3**
Unknown	34	**2.1**	51	**3.1**	37	**2.3**
All	1597	**(100)**	1643	**(100)**	1600	**(100)**

Table 6. Melanoma, Western Australia, 2000-2011: Mean and median Breslow thickness (mm) by sex and diagnosis period.

Year of	MALES			FEMALES		
diagnosis	**Cases**	**Mean**	**Median**	**Cases**	**Mean**	**Median**
2000-2003	2210	1.222	0.600	1563	1.122	0.600
2004-2007	2208	1.331	0.700	1592	1.202	0.650
2008-2011	2453	1.492	0.700	1563	1.375	0.650

Over the same time period, the proportions of melanomas diagnosed in persons under 40 years of age has decreased, with an increasing proportion of diagnoses occurring in persons over the age of 65 in both sexes (Table 7).

Table 7. Melanoma, Western Australia, 2000-2011: Age at diagnosis by diagnosis period.

MALES Years

Age at diagnosis	2000-2003 Cases	(%)	2004-2007 Cases	(%)	2008-2011 Cases	(%)
< 40	338	**14.9**	260	**11.4**	216	**8.6**
40-65	1057	**46.4**	1042	**45.5**	1105	**43.9**
>= 65	881	**38.7**	986	**43.1**	1197	**47.5**
All	2276	**(100)**	2288	**(100)**	2518	**(100)**

FEMALES

Age at diagnosis	2000-2003 Cases	(%)	2004-2007 Cases	(%)	2008-2011 Cases	(%)
< 40	343	**21.5**	267	**16.3**	233	**14.6**
40-65	722	**45.2**	777	**47.3**	747	**46.7**
>= 65	532	**33.3**	599	**36.5**	620	**38.8**
All	1597	**(100)**	1643	**(100)**	1600	**(100)**

Some of the increasing thickness since 2000 is associated with the increasing proportion of diagnoses occurring in older people over time: for the entire period, the proportion of melanomas in the thickest category was lowest in persons under 40 (7.9%) and highest in those over 65 years of age (24%) (Table 8). However, even within each age group for males), and within the youngest and the oldest groups for females, the mean and median thickness increased over time (Table 9).

Table 8. Melanoma, Western Australia, 2000-2011: Breslow thickness (mm) by age at diagnosis.

Breslow thickness	Age at diagnosis: < 40 Cases	(%)	40-65	(%)	>= 65	(%)	All ages	(%)
0 - 0.49	554	**34.2**	1842	**34.6**	1390	**29.9**	3786	**32.7**
0.5 - 0.99	659	**40.7**	1955	**36.7**	1327	**28.6**	3941	**34.0**
1.0 - 1.99	279	**17.2**	919	**17.3**	796	**17.1**	1994	**17.2**
>= 2.00	128	**7.9**	610	**11.5**	1130	**24.3**	1868	**16.1**
All	1620	**(100)**	5326	**(100)**	4643	**(100)**	11589	**(100)**

Table 9. Melanoma, Western Australia, 2000-2011: Breslow thickness (mm) by age at diagnosis and diagnosis period.

	MALES			FEMALES		
Years	**Cases**	**Mean**	**Median**	**Cases**	**Mean**	**Median**
Age < 40				Age < 40		
2000-2003	332	0.845	0.515	334	0.783	0.500
2004-2007	255	0.945	0.620	259	0.956	0.600
2008-2011	209	0.978	0.700	231	1.190	0.620
Age 40-65				Age 40-65		
2000-2003	1031	1.123	0.600	709	0.987	0.550
2004-2007	1012	1.146	0.605	752	0.996	0.600
2008-2011	1088	1.264	0.700	734	0.982	0.600
Age >= 65				Age >= 65		
2000-2003	847	1.489	0.610	520	1.523	0.800
2004-2007	941	1.635	0.760	581	1.577	0.800
2008-2011	1156	1.799	0.790	598	1.929	0.800

2.6 Breast cancer – tumour size and lymph node involvement, 2011

The 1423 breast cancer cases in WA women shown in the "cancers" data in Table 1 show only part of the story regarding breast malignancies seen in any one year. Table 10 shows 11% of all reported malignancies were second or subsequent invasive tumours, and a substantial number of *in situ* cases (most of which are also known as "DCIS" or "ductal carcinoma in situ"). In 2011, an invasive breast cancer was diagnosed in 7 women who had had an *in situ* tumour earlier in the same year, and in 18 other women with a prior record of an *in situ* malignancy.

Median and mean invasive tumour size were lower for invasive tumours diagnosed in women with a previous history of invasive breast cancer, than in "first" breast cancers (Table 11). While such changes may reflect changes in people's tendency to have abnormalities followed up, in situ disease diagnoses are likely also to influence this and a more comprehensive analysis using data for several years would be of interest in a future report.

Table 10. Breast malignancies diagnosed in WA women residents in 2011

Setting -	Number	%
In situ (first ever)	240	12.7
In situ (second or subsequent)	16	0.8
Invasive (first ever)	1423	75.5
Invasive (second or subsequent)	207	11.0
All	1886	(100)

Table 11. Breast tumour size, Western Australia, 2011.

Breast cancer tumour diameter	Mean (mm)	Median (mm)
Invasive (first ever)	21.22	17.65
Invasive (second or subsequent)	15.78	12

The majority of breast cancers have a histological diagnosis (Table 12). Detailed information about tumour size and lymph node involvement relies on pathology reports based on specimens taken at or after the time of a primary tumour excision, and not from histological findings from core biopsy alone. Rarely, a breast tumour is first diagnosed as a result of a lymph node biopsy.

Table 12: First invasive breast cancers, Western Australia, 2011: Basis of diagnosis

Method	Cases	%
Histology	1374	96.6
Cytology	32	2.2
Imaging	5	0.4
Clinical	7	0.5
Necropsy	2	0.1
Death Certificate Only	3	0.2
All	1423	(100)

In Table 13, Registry size categories and the groupings used by BreastScreen are used to show the range of sizes seen for invasive tumours (Size "X" - methodology not amenable to measure e.g. FNA; "N/A" - histological specimen but not a full excision, e.g. core biopsy).

Table 13. Breast cancer, Western Australia, 2011 – invasive tumour size.

Tumour size	Cases	%
0-4 mm	52	3.7
5-9 mm	178	12.5
10-19 mm	434	30.5
20-49 mm	449	31.6
>= 50 mm	75	5.3
N/A	186	13.1
X (method)	49	3.4
Total	1423	(100)

Tumour size (BreastScreen)	Cases	%
0-5 mm	82	5.8
6-10 mm	200	14.1
11-20 mm	447	31.4
21-50 mm	393	27.6
> 50 mm	66	4.6
N/A	186	13.1
X	49	3.4
Total	1423	(100)

Information about lymph node involvement relies on pathology reports based on specimens taken at or after the time of a primary tumour excision. Separate procedures that are reported separately from a tumour excision, are problematic in that if there is no malignancy found, then although these reports are technically notifiable as "related reports" there are problems flagging them at the laboratory level for sending to the Registry. Accordingly, the proportions of persons for which lymph nodes were examined, but all were "negative", may be under-reported.

Intra-operative biopsy is often used to determine if a cancer has spread to a *sentinel lymph node* or nodes, those most directly connected to the relevant area of the breast. The data presented here represents the first time the data concerning "sentinel node" biopsy collected in the Registry since 2009, have been analysed.

The information available confirms that sentinel node biopsy results do appear to be correlated with the overall number of lymph nodes examined, with more than 10 nodes examined in over 40% of cases where sentinel node results were positive, but only 1.4% of cases where they were negative (Table 14).

Table 14. Breast cancer, Western Australia, 2011: sentinel nodes and total nodes examined.

	Total number of lymph nodes examined				
Sentinel node/s affected	1-5	6-10	11-20	> 20	All
No	604	16	7	2	629
%	***96.0***	***2.5***	***1.1***	***0.3***	***(100)***
Yes	104	23	74	19	220
%	***47.3***	***10.5***	***33.6***	***8.6***	***(100)***

Overall numbers of nodes examined and the proportions with positive findings, are summarised in Table 15: as the number of nodes examined increases, the proportion of cases in which none are found to be tumour-affected, decreases – from 84% when 1 – 5 nodes were examined, to only 12.5% when more than 20 were examined. Previous analyses without the specific information about sentinel node biopsy, could have led to significant misinterpretation and confusion between cause and effect.

Table 15. Breast cancer, Western Australia, 2011: lymph nodes examined and numbers involved by tumour.

Total nodes	Tumour-affected nodes								
examined	None	(%)	1-5	6-10	11-20	> 20	Unknown	N/A	Total
None**							231**		231
1-5	627	(83.9)	120				0		747
6-10	33	(39.8)	45	5			0		83
11-20	43	(17.3)	155	25	25		0		248
> 20	8	(12.5)	29	10	11	6	0		64
Unknown	0		0	0	0	0	1		1
N/A								49	49
Total	711	(50.0)	349	40	36	6	232	49	1423

** Negative biopsy findings may not always be reported.

3. Cancer in Western Australia: Data and technical issues

3.1 Basis of diagnosis

Cancers may be diagnosed by a variety of methods, and many methods may be used in the same case. Cancer registries generally record a "best basis of diagnosis" as a guide to the specificity and reliability of the information. Generally "microscopic" methods (histology, cytology, haematology) are regarded as most reliable as compared with clinical findings or imaging. Diagnoses based only on a death certificate ("DCO") are not generally well-regarded (see below). The Registry also uses hospital discharge statistics ("Hospital Morbidity Data System" or "HMDS") to reduce letter-based enquiries and case note review, if data are consistent. Section 3.3 deals with these types of records in greater detail.

The contribution of the different diagnostic methods is seen in Table 16, with over 94% of cases based on a specific pathology test. Historically, the common types of diagnosis least likely to be based on microscopic examination were primary liver cancers, pancreatic cancer and cancers of unknown primary site.

Table 16. Cancer in Western Australia, 2011: Diagnosis methods

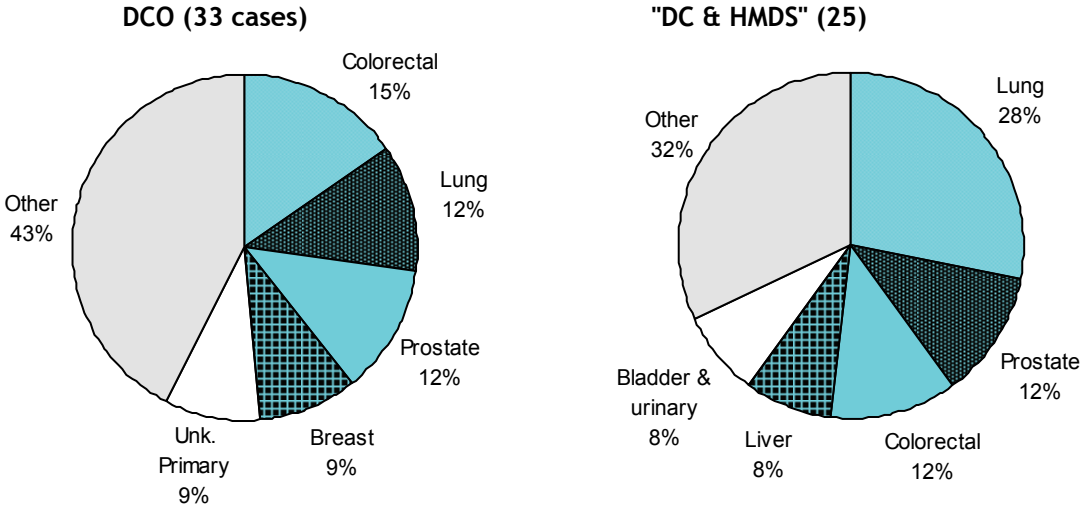
Basis of diagnosis	Cases	%	Basis of diagnosis	Cases	%
Microscopic NOS	16	0.1	Surgery	7	0.1
Histology	9962	85.6	Necropsy	8	0.1
Cytology	771	6.6	DCO	33	0.3
Haematology	250	2.1	DC & HMDS	25	0.2
Imaging	405	3.5	Unknown	39	0.3
Clinical	90	0.8			
Biochemical/Immunologic test	30	0.3	All "microscopic" bases	10999	94.5
			Total	10942	(100)

(DC & HMDS – Death certificate and consistent HMDS data only.)

3.2 Death Certificate and Hospital Morbidity Data System cases

"Death certificate only" (DCO) cancer records are those based solely on a death notification's "cause of death" text. In Western Australia, there were 33 DCO cancers recorded for 2011 (0.3% of all cases, better than for 2010). There were 25 "DC and HMDS" cases recorded for 2011 (Figure 10) (also fewer than for 2010), with the combined total of only 0.5%.

Figure 10. Death Certificate Only (DCO) and "DC & HMDS" cancers 2011: common types



Having a low proportion of DCO cases is widely regarded as an important index of data quality in a Cancer Registry. Although reliability and specificity concerns limit the reliance placed on the "DC & HMDS" records they are preferred over DCOs. The combined total of these two types of records – 0.5% (0.8% in 2010) - is an indicator of good quality in the Registry's data collection by international standards.

3.3 Special Report: Investigation of tumour records based initially on coded hospital separation data (HMDS-based cases).

3.3.1 Introduction

The most recent WA Cancer Registry report[1] included reference to the creation of "HMDS-only" tumour records, based on the coded hospital inpatient statistical data in what is variously known as the "HMDS" (Hospital Morbidity Data System) or Inpatient Episodes of Care data collection.

Some earlier reports[6,7] referred to the outcomes of the extensive work required to assess the veracity of the information, required because a substantial proportion of the information is not correct. The Registry's practice has been to create the records, which are flagged in such a way that they are not included in reported statistics or used to contact individual patients, without further verification. In this summary, the tumour records thus created may be referred to as "HMDS-based" tumours or cases (but might equally-well be described as "suggested", "proposed", "supposed", "putative", or "alleged" cancer records). On investigation, some of these "HMDS-based" records are discovered to have a more reliable basis and to represent a similar or different neoplasm, and some not to be a neoplasm at all; and for some the attempt to obtain verification fails, and these remain in the registry database as "HMDS-only" tumour records. This chapter reports on the assessment of the reliability of the HMDS data and the "yield" in terms of confirmed cancer cases, by cancer type so as to support decisions about where best to direct the Registry's efforts.

Some terminology used in this chapter

- "Cancer" – an invasive malignant neoplasm other than primary squamous cell carcinoma (SCC) or basal cell carcinoma (BCC) of the skin (International standard for cancer incidence reporting); encompassing the site-specific cancers and the malignant lymphohaematopoietic neoplasms such as leukaemias, lymphomas, myeloma and myelodysplasias.
- "WA Cancer" – a Cancer in a person resident in WA at time of diagnosis.
- "HMDS-based record" or "HMDS-based tumour" – a Cancer Registry tumour record created on the basis of information found in the HMDS.
- "HMDS-only record" or "HMDS-only tumour" - a Cancer Registry tumour record that, at the time considered, is (still) based only on information found in the HMDS; these may or may not have been subject to Registry enquiries.
- "Enquiry" – a Registry attempt to obtain further information relating to a cancer case; it may be made by way of a letter to doctor or hospital, a request to a pathology laboratory, or a request to view a set of hospital clinical notes.
- "Haematological malignancy" or lymphohaematopoietic neoplasm (LHN) – *see "Cancers" above*.

The need for better completeness

Impediments to completeness of notification include lack of awareness of requirements, a lack of systems to ensure or monitor compliance, as well as human and technical errors or omissions. Some brief points here will clarify some of the issues discussed later in this report.

Perception and awareness issues - may underlie an ongoing failure to secure routine notification of some cancers otherwise known as haematological malignancies or LHNs. In the most recent (2000) version of the World Health Organization (WHO) *International Classification of Diseases for Oncology* (ICDO-3), several haematological disorders were re-designated to be "malignant" rather than of "uncertain malignant potential" and thus

became “cancers” and subject to mandatory reporting requirements. However it has been clear that this change in coding did not reflect any change in clinical perceptions or practice, and attempts to increase awareness and garner support of haematologists and laboratories have required considerable effort, yet more is apparently needed.

Lack of an adequate system for notification **-** Non-pathological diagnosis on the basis of imaging or other non-laboratory methods is a relatively common reality for certain cancer types and age groups, and while the Registry has had access to the statistical inpatient data collection known as the “HMDS” from which to infer the existence of such cases, the data system lacks key elements that would be required in an adequate “notification”, including the *date of diagnosis*, the *basis of diagnosis*, and the *residence at the time of diagnosis*.

Ad-hoc notification forms are sporadically used but there has been no alternative vehicle for receipt of this additional information. It has been noted previously that in some Australian jurisdictions electronic reports of non-pathological cases from hospitals does occur.

Human and technical errors - understandably occur when codes must be assigned in the absence of pathology and clear clinical direction (e.g. “TCC bladder” without specification of invasion status) or on a presumptive basis before laboratory results are available, or when a laboratory computer-system upgrade changes the way a reference code table is implemented.

Registry procedures

In many cases the records when confirmed indicate a failure of a routine notification process based on pathology, but many records result from non-pathological diagnosis which was, until June 2011, not legally notifiable by hospitals. New Regulations now require notification of non-pathologically-diagnosed cases, however ongoing issues with hospital workloads and development of new data systems have delayed the potential benefit of a more automated flow of relevant information to date.

An assessment of the impact of the HMDS data has been difficult because of the need for both coding expertise and clinical judgment in the creation of new tumour records (for example - are they more likely to represent a new neoplasm, or to be the same as something already known to the Registry?); and the wide variability in the time delays between hospital treatment and the reporting of the HMDS data. Hence the data received in one year will often result in changes in apparent incidence in previous years, when annual statistical reports have already been done, and so there is some pressure to act swiftly on such reports – but not too early while there may be pathology reports still on their way to the Registry.

The decision to create each new record is made in an environment where the Cancer Registry information is case-based and the coding of a tumour is progressively improved so as to represent “truth”; whereas the HMDS data is episode based and the coding of a single cancer case may change many times over the course of diagnosis and treatment. In the absence of other information, a presumed diagnosis date is based on the hospital-episode separation date, and the recorded address is imputed to be the address at diagnosis.

When we add to this the different data sources and versions of people’s birthdates, names and addresses and the difficulties in linkage, the way in which the data change on re-examination can be better understood. After making judgments for thousands of new potential cases each month with only coded information on screen, some records are, in retrospect, created unnecessarily, for example for body sites that overlap e.g. bowel; oesophagus and stomach; or where the clinical distinction between a lymphoma and a leukaemic phase is trivial but the codes are very different.

HMDS-based tumour records are often created and later efforts at verification may be changed or abandoned as person records are merged as duplicates, or as newer information makes it clear that something different should be assumed. These sources include subsequent admissions with different codes, death notifications, and even pathology reports that arrive after unusually-long delays. To maximise the benefit, there is a need for a substantial delay in assessing the HMDS records, so as to avoid unnecessary file requests (for example, a report of a brain tumour might be followed by other hospital reports of metastatic tumours, and finally by a primary lung tumour that matches what the Registry already has on file).

The outcomes recorded on the Cancer Registry database as a result of enquiries, may include changes in tumour type, diagnosis date, supposed area of residence, and the basis of diagnosis – all of which will be examined in this brief report. In cases where enquiries are unfruitful, a Reliability code indicates that an enquiry has been abandoned rather than completed, and may support the tumour's Basis of Diagnosis remaining as "HMDS-only" with further work ruled out. Cases which are shown not to be a tumour at all may be either "deleted" (invalidated), or left with a visible "Not neoplastic" flag so as to avoid the risk of creating another record if the hospital coding is repeated in a later episode.

Even before the development of the Registry's current SQL database and software application (named "CanIS") in late 2008, the handling of the HMDS data involved –

- on-screen examination of the HMDS data in conjunction with Cancer Registry data;
- creation of "notifications" which are then used to support the creation of person and/or Tumour records;
- follow-up of selected types of cases via letters to doctors and hospitals, hospital file requests or both.

In the new database, the creation and tracking of such "HMDS-only" follow-up tasks is now an integrated feature, and this report results from the first attempt to use the data to assess the work of the last few years so as to more efficiently prioritise the tasks of Registry staff.

3.3.2 Methods and scope of records considered

In January 2013 a database extract was made containing the details of 4933 tumour records which had been created in such a way that a linked, HMDS-sourced "notification" record was present that included the initial coding (tumour ICDO-3 site, morphology and behaviour codes) and dates. These records are representative of a period over which the resources and effort devoted to verifying such information have varied, and while this report will focus mainly on the most recent outcomes, the older data can be briefly summarised here.

Of the 4933 records considered, 3450 were initially thought to represent a "cancer" diagnosed in a Western Australian (Table 17).

The analysis initially included a few records for years prior to 2009, based on late arrival or updates to old data. Table 17 shows a concentration of effort on the WA Cancers part of the data, with the bulk of the "Chose not to research" or no-decision recorded cases in this latter half of the table. However, in the WA Cancers section, a workload focus on the new database meant that records for 2009 were not followed up to the full (but continue to be edited and resolved as new information comes to hand).

Table 17. Current status of initially-"HMDS-based" tumour records considered.

Records initially coded as "Cancer" in a Western Australian -

	Year of initially-supposed diagnosis									
Current tumour record status	**2002**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**All**
Status satisfactory	1	1	0	5	93	489	955	815	184	2543
Enquiry outcome pending	0	0	0	0	0	3	14	74	124	215
Not possible to research	0	0	0	0	0	2	4	0	0	6
Enquiry unsuccessful (abandoned)	1	0	0	0	1	10	75	31	1	119
Chose not to "research"	0	0	0	1	8	15	28	33	7	92
No "research" decision noted	0	1	3	1	29	385	38	17	1	475
All	2	2	3	7	131	904	1114	970	317	3450

Other (non-"Cancer" and/or non-WA) records -

	Year of initially-supposed diagnosis									
Current tumour record status	**2002**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**All**
Status satisfactory	0	0	0	0	12	117	189	133	20	471
Enquiry outcome pending	0	0	0	0	0	1	0	6	10	17
Not possible to research	0	0	0	0	0	1	0	0	0	1
Enquiry unsuccessful (abandoned)	0	0	0	0	0	9	21	4	0	34
Chose not to "research"	0	1	0	0	2	23	127	187	93	433
No "research" decision noted	0	0	1	0	2	294	131	96	3	527
All	0	1	1	0	16	445	468	426	126	1483
Total records considered	**2**	**3**	**4**	**7**	**147**	**1349**	**1582**	**1396**	**443**	**4933**

Of the other (non-"Cancer" and/or non-WA) records created on the database, 190 had a non-WA address (76% Australian, 23% from overseas). These tumour records are created for reference as they may indicate a diagnosis that might later be reported as a WA case, or mentioned in a death notification in WA.

Of the 1293 records created with WA addresses but for non-"Cancers", most were related to *in situ* cervical carcinoma, non-malignant CNS tumours, MGUS (monoclonal gammopathy of uncertain significance) and other *in situ* tumours (Table 18). These have been added to the database because they are now legally notifiable and completeness is the ultimate goal; or because they may shed light on a "cancer" record, or cause death.

The priorities for adding such "non-cancer" records and whether to subject them to further enquiries has varied over the years as international coding systems have changed, and while initially some types of records were routinely followed up, some enquiries are no longer made. An example is *in situ* cervical carcinoma, for which records are still created, but for which results indicated an almost universal coding disparity between hospitals and the Registry's interpretation based on pathology reports; another is *in situ* prostate cancer, coding of which was confined almost exclusively to one hospital, and for which records are no longer created.

Table 18. Non-"Cancer" HMDS-based records for WA residents, 2002-2012.

Tumour type	Cases
In situ cervical tumours	378
Benign or uncertain-behaviour CNS tumours	324
"Uncertain malignant potential" LHNs (mostly MGUS)	222
In situ melanomas	79
In situ breast tumours	57
In situ non-melanoma skin cancers	31
In situ colorectal tumours	29
SCC / BCC of skin	26
In situ SCC / BCC of skin	3
Other benign tumours	2
Other *in situ* tumours	142
All records	**1293**

3.3.3 Results

Outcomes – general

Of all the 4933 tumour records considered, 160 (3.2%) have now been invalidated. Of the 3450 records that were initially thought to represent WA cancers, 2760 (80%) are now WA Cancer records but only 1918 (56%) have had a better basis of diagnosis determined, and only these would be included in incidence statistics if reporting at the current time.

The remainder of this summary will focus on HMDS-based records for only the most recent years, with hospital separation dates in 2010, 2011 and 2012, and finally only for the "completed" years 2010 and 2011.

Outcomes – records created for 2010-2012

Most records with separation dates in 2010-2012 were subjected to enquiry, and at the time of writing an outcome of some sort had been obtained for almost 80% of tumour records (Table 19). A number of records were not subjected to follow-up as re-evaluation (in the context of existing records or other information received) indicated no reason to continue to regard them as representing a separate tumour. Enquiries for another 3.7% had not been initiated.

It should be noted that some of the records for which enquiry had been "abandoned" have nevertheless been confirmed and/or altered via other channels, so the use of a "Satisfactory" reliability code is not limited to those for which a specific enquiry outcome was recorded.

Table 19. Outcomes of Registry enquiries regarding HMDS-sourced "WA Cancer" tumour records for 2010-2012.

Outcome	Record valid	Record "deleted"	Total	%
Enquiry yielded some information	1905	9	1914	79.7
Awaiting enquiry outcome	195	1	196	8.2
Enquiry abandoned	137	0	137	5.7
No enquiry, based on context	4	44	48	2.0
No enquiry, other information received	12	5	17	0.7
No enquiry	89	0	89	3.7
All records			2401	(100)

Current status of tumour records

As a result of enquiries and other information, all Registry tumour records are updated to reflect the best available information. A "reliability" code reflects the Registry's degree of satisfaction with the data. Table 20 shows at the time of writing that for the majority of HMDS-based tumour records (79%) enquiries had been successfully completed.

It should be noted that the ***enquiry*** outcome is shown here independent of the outcome in terms of ***changes in the tumour coding*** (which follows in the next section). While the degree of unreliability was reflected by the decision to delete a record in 59 cases, many of the "Satisfactory" enquiry outcomes are associated with a record being no longer coded as

the “WA cancer” initially supposed.

Records for which enquiries were unsatisfactory (117) or still in progress (211) may be used in statistical reporting; records for which no action has been taken may also be reported; however it is long-standing Registry practice than records of any sort may be used in reporting (or in contacting individuals), ONLY if there is now a better basis of diagnosis than “HMDS only”.

Looking now at tumour status in the second half of Table 20, it can be seen that of the 2401 records considered for 2010-2012, only 58% are thought to both (a) represent a WA Cancer, and (b) have a reliable basis of diagnosis that would make them eligible for statistical reporting (although not necessarily of the same cancer type, or in the original diagnosis year).

Table 20. Current status of HMDS-sourced “WA Cancer” tumour records, 2010-2012.

Tumour record status	**Cases**	**%**
Satisfactory	1899	79.1
Awaiting enquiry outcome	211	8.8
Enquiry unsatisfactory	117	4.9
Chose not to follow-up	67	2.8
No enquiry (no decision made)	48	2.0
Record deleted	59	2.5
All	2401	(100)
Current tumour status	**Cases**	**%**
WA Cancer, "improved" basis of diagnosis	1401	58.4
WA cancer, but basis still "HMDS only"	433	18.0
No longer thought to represent a WA cancer	567	23.6
All	2401	(100)

(Note that there may be enquiry outcomes still pending for a tumour record even if one enquiry has already yielded a result.)

Tumour outcomes: data changes

The next section of this report considers only the WA Cancer HMDS-only records for which at least one of the **tumour type, record validity or basis of diagnosis** was now different from the initial coding, **or** for which an enquiry had been "resolved" in some way (whether successful or abandoned).

This omits 280 (11%) of the 2401 proposed records (those for which no enquiry was made, and for which no other information had been received).

Of the 2121 records remaining, a more-reliable basis of diagnosis than "HMDS-only" was now available for 1899. Changes based on tumour type determinations are shown in Table 21. While a just under 80% of records were determined to relate to an actual cancer diagnosis, the remainder were not. Of the "Cancer" proportion, significant proportions were not of the type initially supposed from the coding.

The distribution of results appears similar over the last 3 years, suggesting that the Registry's attempts to adopt a consistent approach to following up the HMDS information has been successful. However, the need to incorporate a large time delay when assessing the outcomes in this report (in which various tables indicate that 2012 data are still substantially incomplete) is unfortunate but cannot be addressed by changes in the Cancer Registry alone.

Table 21. Current tumour characteristics for changed HMDS-based "WA Cancer" records.

	Year of initially-supposed diagnosis					
Neoplasm type after resolution	**2010**	**%**	**2011**	**%**	**2012**	**%**
Cancer, same type	667	73.7	563	70.0	130	68.4
Cancer, similar type	18	2.0	18	2.2	3	1.6
Cancer, different type	46	5.1	31	3.9	7	3.7
Neoplasm, but non-"Cancer"	73	8.1	71	8.8	16	8.4
"Suggestive" of neoplasm but not definitive	26	2.9	23	2.9	5	2.6
Not a neoplasm at all	75	8.3	98	12.2	29	15.3
All	905	(100)	804	(100)	190	(100)

Impact of HMDS-based record outcomes on WA cancer incidence statistics

Although Table 21 shows a high yield of confirmed cancer diagnoses, not all impact on WA cancer statistics, or do so but in a different year to that initially-supposed.

Table 22 shows that of all HMDS-sourced records for which an outcome was obtained, approximately 66% were confirmed to represent valid WA-resident cancer diagnoses, a proportion which was constant over the 3 years considered here. The proportion confirmed **not** to represent WA cancers appeared higher for the most recent (incomplete) year than for 2010, and the un-confirmable numbers lower, which may indicate an improving success rate in resolving enquiries.

(Some caution must be exercised here as the consistency with which records for certain tumour types are created, enquiries initiated and the degree to which reminders and re-requests are sent out, does depend on Registry workload as the bulk of resources must continue to be used primarily in the processing, linkage and coding of incoming pathology and mortality reports.)

Table 22. Outcomes of resolved HMDS-based tumour record enquiries.

Outcome of enquiry	2010	%	2011	%	2012	%
WA Cancer, confirmed	691	65.8	578	66.3	130	65.3
Not a WA cancer, confirmed	253	24.1	249	28.6	65	32.7
Still a WA Cancer, unable to confirm	106	10.1	45	5.2	4	2.0
All resolved cases	1050	(100)	872	(100)	199	(100)

Although many HMDS-sourced tumour records were confirmed to be cancers diagnosed in a WA resident, the diagnosis date derived from the HMDS record was often several years after the actual diagnosis (Table 23). The proportion of confirmed HMDS-based cases actually found in same year as actual diagnosis was 87% for 2010, 82% for 2011 and 81% for 2012.

Table 23. Actual and supposed diagnosis dates for confirmed "WA Cancer" HMDS-based records.

Actual year of diagnosis	Initially-supposed diagnosis - 2010	2011	2012
2012			106
2011		477	15
2010	603	43	3
2009	43	12	1
2008	12	14	2
2007	9	7	1
2006	4	2	0
2005	3	3	0
2004	5	5	0
2003	3	4	1
Before 2003	9	11	1
All	691	578	130

Most recent completed years

HMDS-sourced cases for 2012 are still being followed up and the HMDS data still appears incomplete, as indicated by the lower numbers for 2012 in most tables thus far. Accordingly, the remainder of this report will deal with the data for the two most recent "completed" years of data: 2010 and 2011 only; and only records which were either changed as a result of new information or for which an enquiry was commenced.

Data in Table 24 is set out to show how much of the HMDS-based data has eventually had an impact on annual cancer statistical reports, as distinct from just the tumour-type outcomes themselves. In this report as we progressively narrow down the limits of what is a "useful" outcome, the proportions of cases which appear relevant, diminish. For example, for cases initially supposed to be 2011 diagnoses, 62% (50.8% + 10.8%) were WA cancer cases, but only 56% (46.8% + 9.8%) were of the same type as proposed, and only 46.8% actually diagnosed in the same year as the data suggested.

Alternatively, from Table 24, it can be seen that for HMDS-based "WA Cancer" records for 2010 and 2011, over half (56.7% and 50.8%) were confirmed to represent a WA cancer case in the same diagnosis year, but cancer types were the same as initially coded for only 52% of 2010 records, and 47% of 2011 records. Over the two years combined, the remaining records amounted to -

- A WA cancer of different type and/or diagnosis year (277; 14% of all records)
- A WA cancer record that could not be confirmed (296; 15%)
- A non-cancer neoplasm (144; 7%)
- "Suspicious" for neoplasm only (49; 2%)
- Not neoplastic (170; 9%)

Table 24. HMDS-based tumour records - outcomes for 2010 and 2011 cases.

	2010 records		2011 records	
"WA cancer", confirmed basis -	**Count**	**%**	**Count**	**%**
Same type				
Same diagnosis year	553	52.0	439	46.8
Earlier diagnosis year	80	7.5	92	9.8
Similar type				
Same diagnosis year	14	1.3	15	1.6
Earlier diagnosis year	3	0.3	3	0.3
Different type				
Same diagnosis year	36	3.4	23	2.4
Earlier diagnosis year	5	0.5	6	0.6
All types				
Same diagnosis year	603	56.7	477	50.8
Earlier diagnosis year	88	8.3	101	10.8
Not confirmed to be a WA Cancer				
Basis of diagnosis still "HMDS-only"	161	15.1	135	14.4
Basis of diagnosis now altered -				
Cancer, same type				
Same diagnosis year	6	0.6	13	1.4
Earlier diagnosis year	28	2.6	19	2.0
Cancer, similar type	1	0.1	0	0
Cancer, different type	5	0.5	2	0.2
Non-"Cancer" neoplasm	73	6.9	71	7.6
Suspicious for neoplasm only	26	2.4	23	2.4
No neoplasm	72	6.8	98	10.4
All records	1063	(100)	939	(100)

Variation of enquiry outcomes by cancer type

The outcomes of case enquiries varied with cancer type, and some issues are illustrated in Table 25 and the remaining tables in this report. The "cancer type" groupings are based on those used in most Registry reports worldwide and in WA reports, with some aggregation (for example all leukaemias are combined).

The numbers of Cancer Registry database records created for different tumour types are logically linked to disease abundance in the community, but clearly depend very much on how often different conditions "miss" notification via the usual pathways or are coded in error; so the order of tumour types in most of the following tables has been based on the number of "HMDS-based" records created for each type, independent of how common the disease may be. The findings will be set out in a wider population-based context at the conclusion of the results section.

Table 25 illustrates some of the variation, by tumour type, seen in both data quality and impact on WA cancer reporting.

Among the "HMDS-only" tumour records created, most common was Myelodysplastic syndrome; a condition one might expect to be reported on the basis of either haematological tests (blood films, counts, cytometry) or anatomical pathology (marrow aspirate or trephine). A result was achieved for 80% of enquiries, but 17% showed it not to be a cancer case. 61% of cases were determined to be WA-diagnosed cancer cases, but the initial hospitalization record was in the same year as diagnosis in only 51%; only 40% were determined to be the same tumour type as well.

For lung cancer, often diagnosed by imaging or clinical methods, an outcome was achieved in 95% of cases, and found not to actually represent a cancer in just 7%. 95% of records were found to represent WA-diagnosed cancers, 79% were noted in the same year as diagnosis, and 77% found to be of the same tumour type as well.

Breast cancer is most usually diagnosed by pathological methods; but as it has better survival than lung cancer, records created from WA hospital data are more likely to represent cases that were originally diagnosed elsewhere. For supposed breast cancer cases, an outcome was achieved in 84% of cases, but 13% were found not to be "cancer" (which included some non-neoplasms, but also some *in situ* malignancies). Only 56% were found to be WA-diagnosed cancer cases, and only 49% in the same year as the hospital report, but where a cancer was confirmed all were the same type.

HMDS-based non-melanoma skin cancer (NMSC) records were amongst the most unreliable types studied. Vague coding or mis-coding appearing most likely to account for the high 50% "not cancer" proportion. Such a degree of inaccuracy was shared only by HMDS-based malignant meningioma records (most of the actual tumours were benign) and parotid gland cancers (most of which were determined to be skin squamous cell carcinomas (SCCs)). Although technically a skin-based carcinoma or tumour "NOS" (not otherwise specified) is a "cancer", being not an SCC or a BCC, the use of those two vague codes in HMDS data was most often found to represent SCC or BCC.

The greatest remaining area of concern regarding the accuracy of the HMDS-based tumour records is exemplified by cancers of the bladder and urinary tract, for which 44% were found not to be a "Cancer", many representing pre-invasive or *in situ* disease or what may be "presumptive" coding without reference to laboratory results. For these, only 37%, or just over 1 in 3, were found to represent WA-diagnosed cancers in the actual year of diagnosis.

Some of the more notable outcomes by cancer type were:

Proportion of records actually "Cancer"
Best – Brain, leukaemias, refractory anaemia/cytopenias
Worst – NMSC, bladder & urinary, soft tissues

Proportion of records actually a WA Cancer
Best – gallbladder/biliary, oesophagus, lung, pancreas
Worst – ovary, vulva/vagina, bladder & urinary

Proportion of records actually a WA Cancer in correct year -
Best – oesophagus, gallbladder/biliary, lung, pancreas
Worst – ovary, immunoproliferative neoplasms, NMSC, bladder

Proportion of records a WA Cancer in correct year and same type -
Best – lung, gallbladder/biliary, pancreas
Worst – lymphoma NOS, ovary

Table 25. Outcome of HMDS-based tumour record enquiries for supposed 2010 and 2011 cases, by cancer type.

	All	No information found	Some basis of diagnosis information found (i.e. "countable", if a tumour)											
(Original) cancer type	Number of records	Cases	Cases	% of total	Not cancer	% of total	WA cancer cases	% of total	WA cancer cases (in same diagnosis year)	% of total	WA cancer cases (in same year, and same tumour type)	% of total	WA cancer cases (in same Dx year, but different tumour type)	% of total
Myelodysplastic syndromes	180	36	144	80.0	31	17.2	110	61.1	91	50.6	72	40.0	19	10.6
Colorectal cancer	154	19	135	87.7	43	27.9	87	56.5	80	51.9	78	50.6	2	1.3
Lung, bronchus & trachea	152	7	145	95.4	11	7.2	130	85.5	120	78.9	117	77.0	3	2.0
Prostate	149	19	130	87.2	17	11.4	108	72.5	81	54.4	81	54.4	0	-
Leukaemias	123	28	95	77.2	6	4.9	87	70.7	61	49.6	55	44.7	6	4.9
Other chronic MPDs	89	17	72	80.9	23	25.8	49	55.1	34	38.2	34	38.2	0	-
Melanoma (skin)	86	13	73	84.9	26	30.2	46	53.5	44	51.2	43	50.0	1	1.2
Pancreas	82	6	76	92.7	8	9.8	67	81.7	62	75.6	60	73.2	2	2.4
Bladder & urinary tract	79	11	68	86.1	35	44.3	32	40.5	29	36.7	29	36.7	0	-
Lymphoma, Non-Hodgkin (all)	78	13	65	83.3	11	14.1	50	64.1	43	55.1	36	46.2	7	9.0
Liver & intrahepatic bile ducts	75	10	65	86.7	4	5.3	59	78.7	46	61.3	41	54.7	5	6.7
Breast	75	12	63	84.0	10	13.3	42	56.0	37	49.3	37	49.3	0	-
Myeloma & plasma cell tumours	68	8	60	88.2	11	16.2	47	69.1	43	63.2	39	57.4	4	5.9
Polycythaemia rubra vera	67	8	59	88.1	17	25.4	a	59.7	34	50.7	33	49.3	1	1.5
Unknown primary site	61	12	49	80.3	14	23.0	31	50.8	27	44.3	19	31.1	8	13.1
Kidney	32	7	25	78.1	5	15.6	19	59.4	18	56.3	18	56.3	0	-
Connective & other soft tissues	30	3	27	90.0	12	40.0	15	50.0	12	40.0	9	30.0	3	10.0
Thyroid gland	29	2	27	93.1	6	20.7	20	69.0	18	62.1	18	62.1	0	-
Refractory anaemias/cytopaenias	29	6	23	79.3	0	0.0	23	79.3	19	65.5	15	51.7	4	13.8
Ovary	28	8	20	71.4	8	28.6	9	32.1	7	25.0	7	25.0	0	-
Stomach	25	4	21	84.0	3	12.0	16	64.0	15	60.0	15	60.0	0	-
Brain	23	4	19	82.6	1	4.3	15	65.2	12	52.2	10	43.5	2	8.7
Eye & lacrimal gland	22	3	19	86.4	5	22.7	14	63.6	13	59.1	13	59.1	0	-
Non-melanoma skin cancer (exc. SCC/BCC)	22	2	20	90.9	11	50.0	9	40.9	8	36.4	7	31.8	1	4.5
Lymphoma NOS/unspecified	22	2	20	90.9	7	31.8	11	50.0	10	45.5	5	22.7	5	22.7
Lip, gum & mouth	19	3	16	84.2	4	21.1	12	63.2	11	57.9	11	57.9	0	-
Mesothelioma	19	2	17	89.5	3	15.8	12	63.2	10	52.6	8	42.1	2	10.5
Small intestine	16	2	14	87.5	2	12.5	10	62.5	10	62.5	9	56.3	1	6.3
Gallbladder & bile ducts	15	1	14	93.3	1	6.7	13	86.7	12	80.0	11	73.3	1	6.7
Lymphoma, Hodgkin	15	3	12	80.0	2	13.3	7	46.7	6	40.0	6	40.0	0	-

Table 25 (cont.) Outcome of HMDS-based tumour record enquiries for supposed 2010 and 2011 cases, by cancer type.

	All	No information found	Some basis of diagnosis information found (i.e. "countable", if a tumour)											
(Original) cancer type	Number of records	Cases	Cases	% of total	Not cancer	% of total	WA cancer cases	% of total	WA cancer cases (in same diagnosis year)	% of total	WA cancer cases (in same year, and same tumour type)	% of total	WA cancer cases (in same Dx year, but different tumour type)	% of total
Oesophagus	14	1	13	92.9	1	7.1	12	85.7	12	85.7	10	71.4	2	14.3
Other & U/S immunoprolif. neoplasms	11	4	7	63.6	0	0.0	7	63.6	3	27.3	3	27.3	0	-
Pharynx	10	1	9	90.0	1	10.0	7	70.0	6	60.0	6	60.0	0	-
Vulva / vagina	10	3	7	70.0	3	30.0	4	40.0	4	40.0	4	40.0	0	-
Bones, joints & articular cartilages	9	0	9	100.0	1	11.1	7	77.8	7	77.8	7	77.8	0	-
Parotid gland	9	2	7	77.8	5	55.6	2	22.2	1	11.1	1	11.1	0	-
Testis	7	1	6	85.7	0	0.0	5	71.4	5	71.4	4	57.1	1	14.3
Nasal cavity/sinuses, middle/inner ear	7	3	4	57.1	2	28.6	2	28.6	2	28.6	2	28.6	0	-
Uterus & other female genital	6	1	5	83.3	2	33.3	2	33.3	2	33.3	2	33.3	0	-
Chronic myeloproliferative disease NOS	6	0	6	100.0	1	16.7	5	83.3	3	50.0	1	16.7	2	33.3
Larynx	5	0	5	100.0	1	20.0	4	80.0	4	80.0	4	80.0	0	-
Penis & other male genital	5	3	2	40.0	1	20.0	1	20.0	1	20.0	1	20.0	0	-
Nervous system, periph./autonomic	4	0	4	100.0	4	100.0	0	-	0	-	0	-	0	-
Peritoneum & retroperitoneum	4	1	3	75.0	0	0.0	2	50.0	1	25.0	0	-	1	25.0
Tongue	4	1	3	75.0	0	0.0	3	75.0	3	75.0	3	75.0	0	-
Mast cell malignancies	4	0	4	100.0	0	0.0	4	100.0	4	100.0	3	75.0	1	25.0
Myelofibrosis/sclerosis	4	2	2	50.0	0	0.0	2	50.0	1	25.0	1	25.0	0	-
Cervix	4	0	4	100.0	0	0.0	2	50.0	2	50.0	1	25.0	1	25.0
Anus	3	0	3	100.0	1	33.3	1	33.3	1	33.3	1	33.3	0	-
Malig. histiocytic/dendritic cell neoplasm	3	1	2	66.7	1	33.3	1	33.3	1	33.3	1	33.3	0	-
Meninges (cerebral & spinal)	2	0	2	100.0	1	50.0	1	50.0	0	-	0	-	0	-
Endocrine glands, other	2	1	1	50.0	0	0.0	1	50.0	0	-	0	-	0	-
Adrenal gland	2	0	2	100.0	1	50.0	1	50.0	1	50.0	1	50.0	0	-
Thymus	1	0	1	100.0	0	0.0	1	100.0	1	100.0	1	100.0	0	-
Pleura, heart & mediastinum	1	0	1	100.0	0	0.0	1	100.0	1	100.0	1	100.0	0	-
Spinal cord & cranial nerves	1	0	1	100.0	0	0.0	1	100.0	1	100.0	1	100.0	0	-
All cancer types	**2002**	**296**	**1706**	**85.2**	**363**	**15.9**	**1269**	**63.4**	**1080**	**53.9**	**995**	**49.7**	**85**	**4.2**

Basis of Diagnosis

In the majority of cancer cases from all sources combined, diagnoses are made on the basis of pathological testing of one or more kinds including histology, cytology or haematology. For some, a pathological test is known to have been done but details are unavailable. For a significant proportion of some cancer types, diagnosis is more commonly made on the basis of imaging or clinical techniques. In all cases, the Registry's recording of a code for the "best basis of diagnosis" reflects a greater degree of faith placed in pathological diagnoses, and may not reflect the full range of techniques used. Increasingly, some biochemical testing not actually based on a tumour specimen, may be quite specific however these methods remain relatively uncommon. For the purposes of this summary, "Pathology" includes histology, cytology, haematology and "unspecified" microscopic methods.

In Table 26, the range of basis of diagnosis determinations is shown for the various cancers, based on the cancer type resulting from enquiry rather than on the initially-supposed cancer type, as this appears more logically related to the disease itself.

As expected, for some cancers the percentages for which a pathological basis was discovered were lower than for others – pancreas, liver, lung and prostate, and cancers of unknown primary site. However even for these, at least 20% of cases (and for 47% of lung cancer cases) it was found that pathology had been performed and that the Registry had not been notified. For some other types, most notably the non-lymphoma "haematological" cancers as a group, the un-notified pathologically-diagnosed proportion was as high as 100%.

Over all types, 67% of cases were found to have had a pathological basis of diagnosis which would normally have been expected to lead to them being pro-actively notified to the Registry rather than having the Registry making enquiries.

Table 26. Basis of diagnosis determined for HMDS-sourced cancer records.

Cancer type	Cases	Histology	Cytology	All pathology	%	Imaging	%	Clinical	%	Other & unknown	%
Lung, bronchus & trachea	133	29	33	62	46.6	63	47.4	4	3.0	4	3.0
Prostate	108	32	0	32	29.6	11	10.2	21	19.4	44	40.7
Myelodysplastic syndromes	96	35	2	84	87.5	1	1.0	6	6.3	5	5.2
Colorectal cancer	89	64	1	65	73.0	14	15.7	7	7.9	3	3.4
Leukaemias	86	22	2	82	95.3	0	-	1	1.2	3	3.5
Lymphoma, Non-Hodgkin (all)	68	45	1	53	77.9	2	2.9	0	-	7	10.3
Pancreas	67	10	12	23	34.3	39	58.2	2	3.0	3	4.5
Liver & intrahepatic bile ducts	55	10	0	11	20.0	42	76.4	1	1.8	1	1.8
Other chronic MPDs	49	14	1	46	93.9	0	-	3	6.1	0	-
Melanoma (skin)	45	42	1	43	95.6	0	-	2	4.4	0	-
Breast	43	37	0	38	88.4	3	7.0	2	4.7	0	-
Myeloma & plasma cell tumours	43	20	2	35	81.4	3	7.0	2	4.7	3	7.0
Polycythaemia rubra vera	39	10	1	34	87.2	0	-	2	5.1	3	7.7
Refractory anaemias/cytopaenias	38	24	2	36	94.7	0	-	1	2.6	1	2.6
Unknown primary site	32	8	4	13	40.6	18	56.3	1	3.1	0	-
Bladder & urinary tract	32	8	0	10	31.3	7	21.9	9	28.1	6	18.8
Thyroid gland	20	16	2	18	90.0	1	5.0	1	5.0	0	-
Kidney	19	7	0	7	36.8	12	63.2	0	-	0	-
Stomach	18	13	0	13	72.2	2	11.1	0	-	3	16.7
Gallbladder & bile ducts	17	4	2	7	41.2	9	52.9	1	5.9	0	-
Eye & lacrimal gland	14	4	0	6	42.9	2	14.3	6	42.9	0	-
Lip, gum & mouth	13	11	0	12	92.3	0	-	1	7.7	0	-
Connective & other soft tissues	12	12	0	12	100.0	0	-	0	-	0	-
Brain	12	4	1	5	41.7	6	50.0	0	-	1	8.3
Small intestine	11	9	0	9	81.8	1	9.1	0	-	1	9.1
Non-melanoma skin cancer (exc. SCC/BCC)	10	10	0	10	100.0	0	-	0	-	0	-
Mesothelioma	10	4	4	8	80.0	1	10.0	0	-	1	10.0
Oesophagus	10	6	0	7	70.0	2	20.0	0	-	1	10.0
Ovary	9	5	0	6	66.7	3	33.3	0	-	0	-
Lymphoma, Hodgkin	8	6	1	7	87.5	1	12.5	0	-	0	-
Other & U/S immunoprolif. neoplasms	7	3	1	7	100.0	0	-	0	-	0	-
Bones, joints & articular cartilages	7	6	0	6	85.7	1	14.3	0	-	0	-
Pharynx	7	5	0	5	71.4	1	14.3	0	-	1	14.3
Testis	5	4	0	4	80.0	1	20.0	0	-	0	-
Vulva/vagina	5	3	0	3	60.0	0	-	2	40.0	0	-
Lymphoma NOS/unspecified	5	3	0	3	60.0	1	20.0	1	20.0	0	-
Larynx	4	2	0	3	75.0	0	-	0	-	1	25.0
Tongue	3	3	0	3	100.0	0	-	0	-	0	-
Myelofibrosis/sclerosis	3	3	0	3	100.0	0	-	0	-	0	-
Chronic myeloproliferative disease NOS	3	0	0	3	100.0	0	-	0	-	0	-
Mast cell malignancies	3	3	0	3	100.0	0	-	0	-	0	-
Uterus & other female genital	2	2	0	2	100.0	0	-	0	-	0	-
Parotid gland	2	1	0	1	50.0	0	-	1	50.0	0	-
Nasal cavity/sinuses, middle/inner ear	2	1	0	1	50.0	0	-	0	-	1	50.0
Anus	1	1	0	1	100.0	0	-	0	-	0	-
Nervous system, periph./autonomic	1	1	0	1	100.0	0	-	0	-	0	-
Peritoneum & retroperitoneum	1	1	0	1	100.0	0	-	0	-	0	-
Cervix	1	1	0	1	100.0	0	-	0	-	0	-
Penis & other male genital	1	1	0	1	100.0	0	-	0	-	0	-
Spinal cord & cranial nerves	1	1	0	1	100.0	0	-	0	-	0	-
Malig. histiocytic/dendritic cell neoplasm	1	1	0	1	100.0	0	-	0	-	0	-
Thymus	1	0	0	0	0.0	1	100.0	0	-	0	-
Pleura, heart & mediastinum	1	0	0	0	0.0	1	100.0	0	-	0	-
Meninges (cerebral & spinal)	1	0	0	0	0.0	1	100.0	0	-	0	-
Adrenal gland	1	0	0	0	0.0	0	-	0	-	1	100.0
All cancers	**1269**	**567**	**73**	**848**	**66.8**	**250**	**19.7**	**77**	**6.1**	**94**	**7.4**

Contribution of "HMDS-based" tumour information to State cancer incidence statistics

The impact of the confirmed HMDS-based data is summarised in Table 27, for cancer types among the most common in the overall State data, or HMDS-based data or both.

Overall, some 57% of "proposed" HMDS-based cancer cases were confirmed and incorporated into the statistical database for the correct year; and these constituted **4.8%** of the (now) reportable incident cancers for the last 2 years. If these HMDS-based records had not been "researched" but accepted as reliable without verification, the State totals would have been added to by 8%.

For some cancers, the contribution of the confirmed HMDS-based cases to the State total was numerically large but, as a proportion, relatively slight - 146 lung cancers (3.7%), 70 breast cancers (2.4%). For some other common cancers, contributions to State data were more substantial: for leukaemias overall, the 113 confirmed cases comprised almost 18% of the State total, and other common cancers whose numbers were boosted significantly by these data included myeloma, pancreas, bladder and cancers of unknown primary site.

Table 27. Impact of HMDS-based cancer data on State reportable cancer totals, 2010 and 2011.

Cancer type	Confirmed cases (all sources) 2010 & 2011	Proposed HMDS-based cases	% of State total	Confirmed cases, same diagnosis year	% of State total	Proportion verified, same year
Prostate	3993	146	3.7	82	2.1	56.2
Breast	2905	70	2.4	41	1.4	58.6
Colorectal cancer	2727	148	5.4	84	3.1	56.8
Melanoma (skin)	2151	84	3.9	43	2.0	51.2
Lung, bronchus & trachea	2018	148	7.3	125	6.2	84.5
Lymphoma, Non-Hodgkin (all)	863	73	8.5	56	6.5	76.7
Leukaemias	636	113	17.8	60	9.4	53.1
Kidney	571	29	5.1	18	3.2	62.1
Thyroid gland	504	28	5.6	18	3.6	64.3
Pancreas	489	80	16.4	62	12.7	77.5
Bladder & urinary tract	486	75	15.4	29	6.0	38.7
Unknown primary site	485	50	10.3	28	5.8	56.0
Uterus & other female genital	429	6	1.4	2	0.5	33.3
Lip, gum & mouth	370	19	5.1	12	3.2	63.2
Stomach	364	25	6.9	20	5.5	80.0
Brain	327	22	6.7	10	3.1	45.5
Myeloma & plasma cell tumours	302	68	22.5	39	12.9	57.4
Oesophagus	268	14	5.2	10	3.7	71.4
Liver & intrahepatic bile ducts	245	71	29.0	43	17.6	60.6
Ovary	236	26	11.0	8	3.4	30.8
Mesothelioma	201	19	9.5	9	4.5	47.4
Non-melanoma skin cancer (exc. SCC/BCC)	192	22	11.5	9	4.7	40.9
Myelodysplastic syndromes	127	165	129.9	80	63.0	48.5
Other chronic MPDs	58	81	139.7	34	58.6	42.0
Polycythaemia rubra vera	36	65	180.6	34	94.4	52.3
All cancer types	**22846**	**1922**	**8.4**	**1105**	**4.8**	**57.5**

However, the impact of the confirmed HMDS data was proportionately greatest for some of the less well-known cancer types.

- For polycythaemia rubra vera, 94% of the State total confirmed case numbers for 2010 & 2011 were initially HMDS-based tumours.
- Proportions were also very high at 63% for myelodysplastic syndromes and 59% for "other" chronic myeloproliferative diseases (incorporating idiopathic or essential thrombocythaemia, chronic neutrophilic leukaemia and hypereosinophilic syndrome).
- Taken in context with leukaemias and myeloma, these HMDS-sourced non-lymphoma "haematological" malignancies (LHNs) together constituted 21% of the State totals for their types; but the 247 confirmed cases represented only a little over 50% of the 492 cases that were created based on the HMDS data alone.

3.3.4 Discussion and future directions

Setting priorities

In an ideal situation, legislated requirements imposed on those who generate health information would ensure the routine receipt of relevant information by the Cancer Registry and allow work to focus on collation, coding and follow-up of cases of undetermined status, and use of the "complete" data for both statistical purposes and health research. The Registry's commencement of processes for seeking additional information from non-notifying sources was based on a perception that notification was incomplete, and has continued at considerable cost.

Seeking confirmation of the "HMDS-based" cancer records created on the Registry database, requires more effort per case, than the routine handling of cancer cases for which pathology reports are received. For the effort to be justified, it must have an impact on the Registry's performance of one or more functions.

Benefits of obtaining the "missed" information include the following:

- Improving the completeness of accurate cancer incidence statistics for annual reporting and use in projections
- Improving the proportion of people with cancer who can be involved in health research studies
- Improving the accuracy and relevance of survival analysis by correctly determining accurate diagnosis dates.
- Improving our knowledge of the contribution of non-pathological diagnosis to overall cancer care

The tumour records that have most immediate and obvious impact on these issues are those that are confirmed to be WA-diagnosed, and in the same year; these may be included in annual reports if confirmed to be "cancers", and this reduces the impact of subsequent ongoing revisions of incidence statistics. When enquiring about cases, rapid results are of benefit if statistics and involvement in research are valued. Accordingly some priority, for pragmatic reasons, must be given to doing relatively-recent cases, first; rather than concentrating effort on a batch of several hundred old hospital records that arrives a year out of step with most other data, for example.

If information on follow-up suggests an earlier diagnosis date than originally suspected, updating the Registry enhances the accuracy of future projections by retrospectively increasing historic incidence rates. Likewise, survival analysis is improved by adding "old" information to the Registry that assists in interpretation of mortality information. Finally, in the majority of health research projects in which the Registry is used to recruit participants, the subjects sought have recent diagnoses, and no previous cancer diagnoses – and so adding the "old" information assists the Registry to ensure that patient recruitment matches research case definitions.

From the stepwise presentation of some of the aspects of the "HMDS-based record" issue in this report, it should be apparent there is considerable valuable information available from the follow-up enquiries of the HMDS-based tumour records created by the Registry – but that the quality of information, and the quantity of missing information, varies with coded tumour type.

Reasons for variation in quality and quantity are many. They may include rarity and unfamiliarity with coding systems, keyboarding errors, coding on presumption or written diagnosis without reference to outcomes of tests, varying proportions of cases given imaging, clinical or other non-pathological diagnosis; and tendency of survivors of some conditions more than others, to be more mobile and to be treated in WA for conditions diagnosed elsewhere.

Finally, systematic and sporadic failures of person-based, electronic or hybrid pathology notification systems do happen and despite the Registry's best efforts to monitor notification sources (examining periodic report tallies by reporting establishment), may go un-corrected for considerable periods.

In summary, the overall data quality analyses presented in this report show that the HMDS-based information currently created on the Registry database and followed up, comprises almost 5% of the State's reported all-cancers incidence totals in recent years, but that the supposed information is substantially wrong in about 50% of cases.

There does not appear to be any "statistical" method of justifying the acceptance (without question) of some types of records as reliable but to continue to "research" others; and the disproportionately high workload (per case confirmed) for Registry staff is increasingly difficult to justify in the face of an ever-increasing volume of pathology reports that are received in a timely and efficient way through normal channels.

There appears no convenient shortcut that would see the Registry abandoning interest in some cancer types, or in the coding work of some hospitals. However there have been some approaches considered in the face of this growing problem:

1. Registry staff have for many years had extract-based access to hospital data that assist in selecting the most effective target for a case enquiry; access to a thick clinical-notes file at a teaching hospital is often more productive than a letter to a doctor.

2. The Cancer Notification Regulations were changed in 2010 to make the direct reporting of non-pathologically diagnosed cancer cases by WA hospitals mandatory (bringing WA into line with other Australian States and territories). This would be expected to have some impact on the numbers of HMDS-based lung, liver, pancreatic and prostate cancers especially. Changes in hospital patient information systems are yet to deliver this benefit.

3. One Regulations update specifically aimed at the issue of under-notification of haematological disorders or LHNs, was the inclusion of an explicit list of conditions subject to notification – *"leukaemia; lymphoma; plasma cell, mast cell or histiocytic neoplasm; myelodysplastic syndrome; refractory anaemia; refractory cytopaenia; chronic myeloproliferative disorder; polycythaemia rubra vera; idiopathic and essential thrombocythaemia; myelofibrosis; myelosclerosis; and any other immunoproliferative, lymphoproliferative or myeloproliferative disorder"*.

4. A Hospital cancer case notification form has been available for many years for use by coders in a situation where they know a notification may not otherwise occur (e.g. clinical diagnosis). The new regulations legitimise this practice and may initially be the only avenue whereby the private hospitals can comply with the Regulations.

5. In the new CanIS system in 2008, case enquiry procedures were built into the database application so that generation of file lists and doctor-letters, and tracking of enquiries, became integrated and more efficient. However, efforts at efficiency are still frustrated by mobility of the medical workforce and the failure of the national medical registration authority to provide mailing addresses for doctors in the way that the State-based Medical Boards once did.

6. A new Patient Administration System (WebPAS) being piloted in the WA public hospital system, has capacity for a Cancer Reporting module and screens and code sets have been designed with Registry staff in consultation with key coders and technical consultants; progression to getting reports from the system and having the system used, requires further work. This remains an ongoing task.

7. Recently, HMDS-based case enquiry letters to haematologists in particular, have focused on attempts to have them cooperate in obtaining full notification by laboratories, with some improvement in Registry awareness of laboratories requiring more monitoring and attention.

8. Most recently, Registry staff have gained real-time access to a public-hospital patient information system (iSoft Clinical Manager) whereby some forms of missed reports, and others such as imaging reports and consultation reports, are available without having to go to individual hospitals.

Future directions

The justification for "researching" HMDS-sourced tumour records might come to be questionable in two sets of circumstances. Firstly, and positively, if the contribution of HMDS-sourced "cases" for investigation fell to a very low percentage of all cases (currently 8%); or, with great concern, if the Registry staff could not spend any time following up such cases because all their time was spent in reading and coding pathology reports.

While current processes could continue for some time, limitations on resources and growing case numbers together dictate some emphasis on developing systems that increase routine notifications, and reduce the need for individual case enquiries. More efficient ways of accessing information merely delays the time when the follow-up of HMDS-based tumour records can no longer be justified.

Review of Registry processes in 2012 has already resulted in decisions not to create, or not to follow up, certain types of tumour records -

- *in situ* cervical carcinoma
- *in situ* prostate carcinoma
- skin tumours with the vague "carcinoma NOS" or "tumour NOS" morphologies (8000/3 or 8010/3)
- benign and "uncertain behaviour" CNS tumours
- *in situ* urinary system transitional cell carcinomas
- "uncertain malignant potential" haematological neoplasms.

Other limitations, such as writing just one enquiry letter and one reminder, or only requesting a hospital file once, are implemented from time to time as workload dictates.

In the longer term, the most promising avenues for change are likely to be the development of extracts or reports from WebPAS to improve hospital notification of clinically-based or imaging-based cancer diagnoses; and a focus on the laboratory reporting of haematological malignancies – which may require the development of computerised algorithms to select relevant reports from the vast bulk of blood reports that do not incorporate any "Conclusion".

Current moves to re-establish functionality of the various Hospital-Based Cancer Registries using a common database and data exchange mechanism, appear to be nearing fruition and may soon restore a level of access to cancer case information already assessed and coded at the hospital level, that will address some of the problems of "missing" cases due to non-pathological diagnosis.

When approached with a view to education about the importance of the information being sought, seeking the cooperation of the State's hospitals and medical practitioners in this effort appears a reasonable expectation. If these efforts are not successful, then inevitably the detection of some forms of cancer will be delayed until mentioned on a Death Certificate, or missed altogether.

4. References

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Note: 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 Health (Notification of Cancer) Regulations 1981 require the reporting of cancers diagnosed by pathologists, haematologists and radiation oncologists; the current 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 Australian Institute of Health and Welfare (AIHW) who collate State information and manage the Australian Cancer Database in Canberra. Data are also provided to 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 regularly 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 asbestos exposure and other history for all cases of 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 sent 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 including BCC and SCC.

Legislative basis

The Registry acted with the delegated authority of the Executive Director of Public Health with respect to the Health (Notification of Cancer) Regulations 1981, until June 2011 when the new HEALTH (WESTERN AUSTRALIAN CANCER REGISTER) REGULATIONS 2011 took effect.

The Regulations 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 a variety of other neoplasms (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 the Registry of 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 WA Registrar-General's Office via the Data Linkage Branch of the Population Health Division. 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 information including country of birth and Aboriginality or indigenous status, can often be obtained, from extracts of the W.A. Hospital Morbidity Data System (HMDS) files, or via on-line access to a Patient Master Index maintained in Perth Metropolitan Area government hospitals.

Data handling and maintenance

Since 2008 when a new SQL Server database was commissioned, Registry staff have converted all paper records into image files that are stored within the database; the process for historical information is now completed. This permits a limited number of users with limited access from remote sites to find all information without making enquiries of other staff, and frees Registry staff from the task of locating paper records for coding or review.

New registrations and updates are made on the new custom-designed database, which also manages and stores the case lists and correspondence associated with the "further enquiry" process. In general, cancer cases are recorded with one demographic record for each person with a separate, linked record for each tumour, each of which may have from one to many associated "notifications". Incomplete records, or those found to be inaccurate in the light of new information, are progressively updated, and the data continually enhanced until the time of any final update (such as when adding mortality information). Registry records that are duplicates of existing cases are now handled by cross-referencing to the "valid" case, rather than deletion, minimising 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 boundaries and the types of information requests received. The vast majority of tables in this report are created directly from this in-house software.

Where resources permit, customised tabulations using similar area and age group subdivisions are available to anyone who makes a 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); which is superseded by ICD-10.

ICD-O permits separate coding of topography ("site"), morphology ("tissue") and behaviour, and thus allows a more comprehensive characterisation 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) (ICD-O-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 uses 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, melanomas of unknown primary site are treated as primary skin melanoma for tabulation purposes.

Diagnoses in non-Western Australian residents 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 and current data, 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 was once a useful monthly process but ABS has refused to support this since 2005. This exchange was extremely 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, similar 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 tumour types are different enough to permit both to be counted. Groups of types considered to be different, for the purposes of allowing the counting of more than one tumour of the same "site", are based on an ICD-O-3-based table as promulgated by the International Association of Cancer Registries (refer to http://www.iacr.com.fr/MPrules_july2004.pdf). 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 counted in incidence statistics. Lymphohaematopoietic malignancies are treated

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

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 site. The urinary tract is treated as a special case of an "extended site", whereby multiple transitional cell carcinomas of sites C65*x* to C68*x* , ***including*** 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 overestimates cure rates. To allow better analysis, the Registry now separately records all tumours, so that statistics counting tumours, rather than cases, can be provided if required.

This Report uses the "multiple-primary" rules based on the ICD-O-3 classification and tumour groupings will differ slightly from those used in some previous publications (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 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.

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, 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 hospitalisation 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 Data System, which records details of all hospitalisations 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 Department of Health (WA)'s Human Research Ethics Committee.

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 (now part of Cancer Australia).

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.

[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.

Appendix 1B. Current issues

Registry staffing and workload

In 2003, a long process resulted in reclassification of "Clerical Officers" to a higher level, redesignated "Data Quality Officers". In 2011, one position was converted to a Data Quality Coordinator role. A clerical officer has been temporarily attached to the Registry and the resources now available to service the needs of a population of 2 million people now include -

Principal Medical Officer/Manager	1.0 fte
Medical Officer/coding adviser	0.2 fte
Data Quality Coordinator	1.0 fte
Data Quality Officers	2.5 fte
Clerical officer (data handling)	1.0 fte
Mesothelioma research officer	0.25 fte
Analyst/programmer	1.0 fte

Additional resources used include financial/ Human Resources services and Epidemiology Branch advice on some statistical issues. However all reports such as this are produced primarily within the Registry itself.

Workload is not adequately represented by reported “cancer” totals. In 2010, there were 10942 invasive cancer cases as mentioned earlier in this report. However, in the same year there were 53158 (up from 42288 in 2010) “notifications” handled (pathology reports, letters, case notes and other records), 22384 (up from 16827 in 2010) tumour records created, and at least 12420 other tumour records were edited in some way by staff (and not updated since).

Increases in these workload estimates exceed population growth rates, and underscore the need to properly resource disease registries and 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

Until 2011, Western Australia was the only Australian State with 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, was completed and is summarised in *Cancer incidence and mortality in Western Australia, 2005*.[a]

These findings were published 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. 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 (PAS), and a cancer notification module from the currently-favoured replacement system has been demonstrated. New Regulations are now in place, but effective changes in some aspects of notification must await changes in hospital information systems.

[a]Threlfall TJ, Thompson JR (2007). Cancer incidence and mortality in Western Australia, 2005. Department of Health, Western Australia, Perth. Statistical Series Number 81.

Appendix 2. Technical and miscellaneous information

Appendix 2A. Glossary

General

AAR	Age-adjusted rate - rate resulting from age-standardisation using only a subset of the entire age range for cases and population, e.g. 0 - 15 years.
ABS	Australian Bureau of Statistics
ASR	Age-standardised 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
CNS	Central Nervous system (meninges, brain, spinal cord, cranial nerves and pituitary gland)
DCO	Death certificate only
d/o	disorder
ICD-O	International Classification of Diseases for Oncology
LHN	Lymphohaematopoietic neoplasms (mainly lymphomas, leukaemias and myeloma)
LR	Lifetime (cumulative) risk (to a particular age, usually 75 years)
NMSC	Non-melanoma skin cancer
NOS	Not otherwise specified
PYLL	Person-years of life lost (before a particular age, usually 75 years)
SCC	Squamous cell carcinoma
SD	Standard deviation
U/S	Unspecified

Additional terms used in headings or cells 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)
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).
<5	Case count between 1 and 4 inclusive
NR	Not Reported – an ASPR or a percentage based on a cell "<5"; or a case count suppressed so as to prevent calculation.

[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, i.e. "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 analysed, 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-standardised 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:

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

where w_i is the World Standard Population [b] for the *i*th 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 standardisation 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 standardisation. 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 Standardised Incidence (or Mortality) Ratio and a 95% confidence interval.

[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.

Cumulative Incidence and Cumulative 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, whereas cumulative rates are commonly presented as percentages affected. In Registry reports, risk is usually presented as cumulative 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 WA population data were used for calculation of 2011 rates in this report

Age	Males	(%)	Females	(%)	Total	(%)
0- 4	79887	6.8	76432	6.5	156319	6.6
5- 9	74332	6.3	71733	6.1	146065	6.2
10-14	75786	6.4	72710	6.2	148496	6.3
15-19	79309	6.7	75608	6.5	154917	6.6
20-24	91698	7.7	85286	7.3	176984	7.5
25-29	96492	8.2	88296	7.6	184788	7.9
30-34	84715	7.2	81465	7.0	166180	7.1
35-39	85486	7.2	83334	7.1	168820	7.2
40-44	87424	7.4	85619	7.3	173043	7.4
45-49	84420	7.1	82911	7.1	167331	7.1
50-54	79137	6.7	78822	6.7	157959	6.7
55-59	69710	5.9	70384	6.0	140094	6.0
60-64	63220	5.3	62778	5.4	125998	5.4
65-69	45929	3.9	45334	3.9	91263	3.9
70-74	33263	2.8	35116	3.0	68379	2.9
75-79	23724	2.0	27907	2.4	51631	2.2
80-84	16893	1.4	22456	1.9	39349	1.7
85 +	11911	1.0	22689	1.9	34600	1.5
TOTAL	1183336	(100)	1168879	(100)	2352215	(100)

(Data from Australian Bureau of Statistics as collated by Performance Activity & Quality Division, Department of Health, and used for calculation of rates in this Report.)

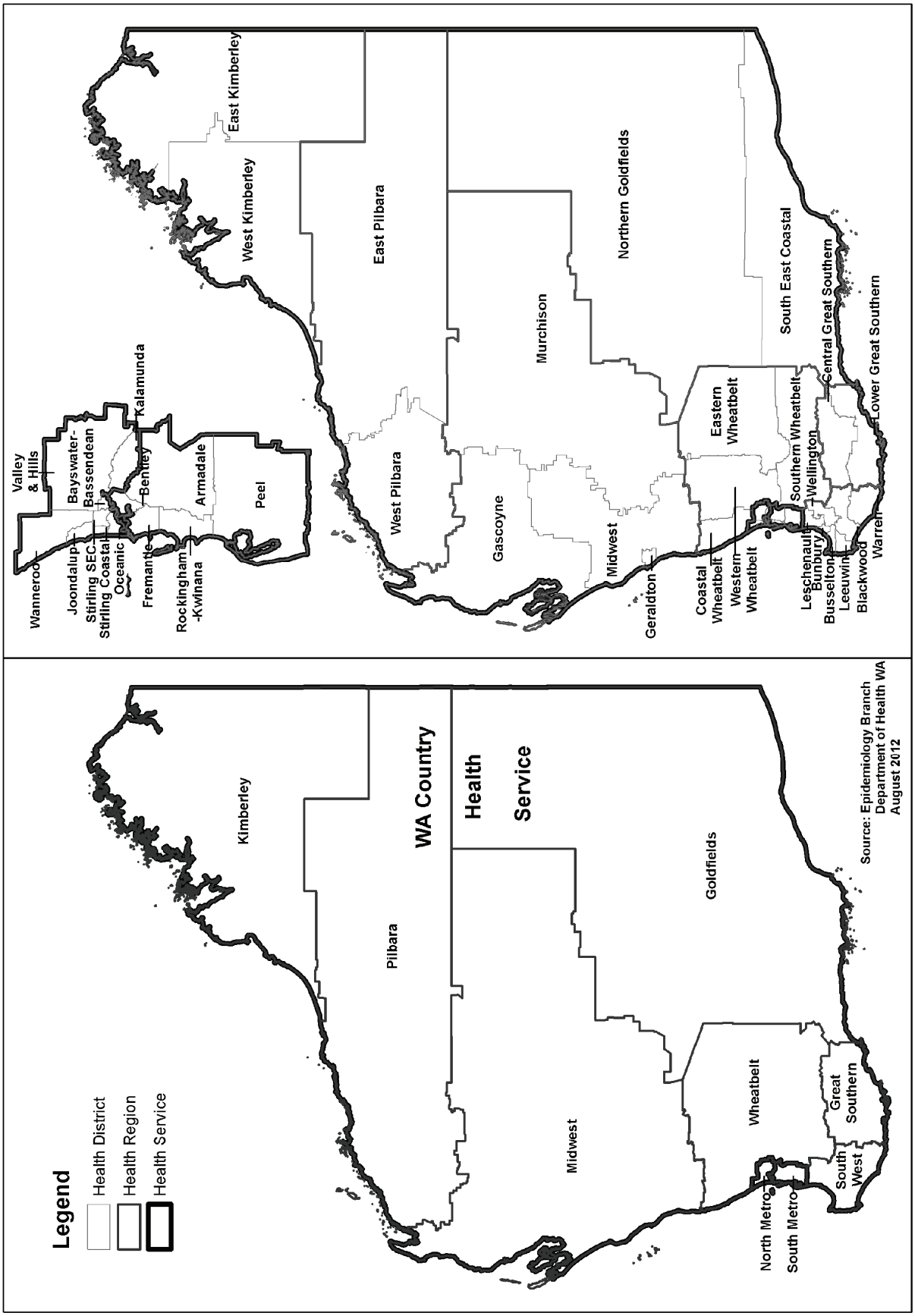
The Department of Health's area of responsibility is administered through two Area Health Services (AHS) (metropolitan) and the WA Country Health Service (WACHS), comprising seven Regions. Overall, the area is divided into 34 Health Districts (HD), each lying entirely within an Area Health Service (AHS) or Health Region (HR). Areas may not match "current" arrangements at any given point in time however data files and population files are synchronised to ensure accurate 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 HR**	**North Metro AHS**
East Kimberley HD	Northern Goldfields HD	NMAHS Bayswater-Bassendean HD
West Kimberley HD	South East Coastal HD	NMAHS Joondalup HD
CHS Pilbara HR	**CHS Great Southern HR**	NMAHS Kalamunda HD
East Pilbara HD	Central Great Southern HD	NMAHS Oceanic HD
West Pilbara HD	Lower Great Southern HD	NMAHS Stirling Coastal HD
CHS Midwest HR	**CHS South West HR**	NMAHS Stirling SE Coastal HD
Gascoyne HD	Blackwood HD	NMAHS Valley and Hills HD
Geraldton HD	Bunbury HD	NMAHS Wanneroo HD
Midwest HD	Busselton HD	**South Metro AHS**
Murchison HD	Leeuwin HD	SMAHS Armadale HD
CHS Wheatbelt HR	Leschenault HD	SMAHS Bentley HD
Coastal Wheatbelt HD	Warren HD	SMAHS Fremantle HD
Eastern Wheatbelt HD	Wellington HD	SMAHS Peel HD
Southern Wheatbelt HD		SMAHS Rockingham-Kwinana HD
Western Wheatbelt HD		

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

WA Area Health Service, Region and Health District boundaries



Appendix 2D. Access to Registry information

Release of data may occur at a number of levels:
Summarised 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.

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

Identified information will normally be made available to relevant Australian State or Territory Cancer Registries and to the Australian Institute of Health and Welfare, for the purposes of improving data quality and consistency. Data are released to the AIHW subject to a provision that any use of such identified data for other purposes is to be referred to this Registry for approval.

Special information pertaining to identified patients of a particular hospital or doctor may be released by the Principal 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 Human Research Ethics Committee (HREC) if there is concern regarding the identification of individual service providers.

Applications for further information required for specific areas of research will be referred to the HREC which, subject to formal application, may approve the release of identified information to researchers.

The objectives and functions of the HREC include the following key points –
Objectives -

- Promote the ethical use of health information.
- Promote ethical standards of human research.
- Protect the welfare, rights and dignity of individuals.
- Facilitate ethical research through efficient and effective review processes.

Functions –

- To provide independent, competent and timely ethical review of projects involving the use and disclosure of personal health information and other research projects with respect to their ethical acceptability.
- To review projects involving personal health information and other research projects in accordance with the National Statement on Ethical Conduct in Human Research (National Statement) and the DOH Practice Code for the Use of Personal Health Information.
- To review projects requiring the use and disclosure of personal health information without consent.

The Committee's details and relevant documentation may be found at http://www.health.wa.gov.au/healthdata/HREC/index.cfm.

Appendix 2F. Cancer codes

(a) ICD-O Site codes

Codes(1)	Site/Topography	Codes	Site/Topography
C00 - C06	Lip, gum & mouth (excludes C01-C02)	C49	Connective, subcutaneous & other soft tissues
C01 - C02	Tongue	C50	Breast
C07	Parotid gland	C51	Vulva
C08	Salivary glands	C52	Vagina
C09 - C14	Pharynx (excludes C11)	C53	Cervix uteri
C11	Nasopharynx	C54	Corpus uteri (Uterus)
C15	Oesophagus	C55	Uterus, NOS (rarely used)
C16	Stomach	C56	Ovary
C17	Small intestine	C57	Uterine adnexa & other fem. genital
C18	Colon	C58	Placenta
C19 - C20	Rectosigmoid junction & rectum	C60	Penis
C21	Anus	C61	Prostate gland
C22	Liver & intrahepatic bile ducts	C62	Testis
C23 - C24	Gallbladder & bile ducts	C63	Male genital, other
C25	Pancreas	C64	Kidney (excludes renal pelvis C65)
C30 - C31	Nasal cavity & sinuses, middle & inner ear	C65 - C68	Bladder & urinary tract
C32	Larynx	C69	Eye & lacrimal gland
C33 - C34	Lung, bronchus & trachea	C70	Meninges (cerebral & spinal)
C37	Thymus	C71	Brain
C38	Pleura, heart & mediastinum	C72	Spinal cord & cranial nerves
C40 - C41	Bones, joints & articular cartilages	C73	Thyroid gland
C44	Skin	C74	Adrenal gland
C47	Nervous system, peripheral & autonomic	C75	Endocrine glands, other
C48	Retroperitoneum and peritoneum	C80	Unknown primary site

Notes: (1) Only 1st 3 characters shown. Groupings based on IARC rules governing the reporting of incident cancers for ICDO-3. 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 ICD-O-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 ICD10), future reports may eventually follow the WHO classification scheme.

Since 2003, some 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, updated 2011)

			WACR code	ICD-O-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, 9698-9699,9766
	1c2	NHL, mature T / NK 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	Malignant histiocytic/dendritic cell neoplasms	HIH	9750, 9754-9758
	4c3	Other & unspecified immunoproliferative neoplasms	HII	9760-9764

*9597, *9598 and *9599 are WACR 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 ICD-O classification as code 9591.

Appendix 2G. WACR publications

***Note**: It is strongly recommended that retrospective studies utilise 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.*

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.

Threlfall TJ, Thompson JR (2006). Cancer incidence and mortality in Western Australia, 2004. Department of Health, Western Australia, Perth. Statistical series number 76.

Threlfall TJ, Thompson JR (2007). Cancer incidence and mortality in Western Australia, 2005. Department of Health, Western Australia, Perth. Statistical Series Number 81.

Threlfall TJ, Thompson JR (2007). Cancer incidence and mortality in Western Australia, 2006. Department of Health, Western Australia, Perth. Statistical Series Number 82.

Threlfall TJ, Thompson JR (2009). Cancer incidence and mortality in Western Australia, 2007. Department of Health, Western Australia, Perth. Statistical series number 86.

Threlfall TJ, Thompson JR (2010). Cancer incidence and mortality in Western Australia, 2008. Department of Health, Western Australia, Perth. Statistical series number 87.

Threlfall TJ, Thompson JR (2011). Cancer incidence and mortality in Western Australia, 2009. Department of Health, Western Australia, Perth. Statistical series number 91.

Threlfall TJ, Thompson JR (2012). Cancer incidence and mortality in Western Australia, 2010. Department of Health, Western Australia, Perth. Statistical series number 94.

Appendix 2H. Guide to tables in Appendix 3

Note: The order of cancer types in the tables in Appendix 2F is 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, ASR, 95% confidence interval, 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 or squamous cell carcinoma (ICD-O-3 morphology codes 8050 - 8110).

- **Notes** -

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

In **Appendix 3B**, the "Total deaths due to cancer" appears on page A3-19. The "Total deaths (cancer and non-cancer) of Cancer Registry cases" on page A3-20 includes non-cancer and all other deaths in persons with a valid WA tumour record.

Appendix 3A. Cancer incidence, Western Australia, 2011

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, gum & mouth (C000-C069) (not C01 C02)																									
M				<5	<5	<5	<5	6	5	12	8	6	18	17	9	10	<5	7	**108**	**6.7**	5.4-8.0	100.0	0.7	136	9.3 (7.5-11.1)
				NR	NR	NR	NR	7.0	5.7	14.2	10.1	8.6	28.5	37.0	27.1	42.2	NR	58.8							
F						<5		<5	<5	<5	5	6	<5	<5	9	<5	5	6	**47**	**2.4**	1.7-3.2	98.0	0.3	348	3.8 (2.7-4.9)
						NR		NR	NR	NR	6.3	8.5	NR	NR	25.6	NR	22.3	26.4							
Tongue (C010-C029)																									
M							<5	<5	<5	<5	7	10	9	6	<5	<5	<5	<5	**50**	**2.9**	2.1-3.7	98.0	0.3	301	4.2 (3.0-5.4)
							NR	NR	NR	NR	8.8	14.3	14.2	13.1	NR	NR	NR	NR							
F					<5			<5		<5	<5	<5	6	<5	<5	<5	6		**28**	**1.5**	0.9-2.1	100.0	0.1	704	2.2 (1.4-3.1)
					NR			NR		NR	NR	NR	9.6	NR	NR	NR	26.7								
Parotid gland (C070-C079)																									
M							<5		<5	<5	<5	<5	<5		<5	<5	<5		**15**	**0.8**	0.4-1.2	100.0	0.1	1190	1.4 (0.7-2.1)
							NR		NR	NR	NR	NR	NR		NR	NR	NR								
F												<5			<5	<5	<5		**<5**	**0.2**	0 - 0.3	100.0	0.0	4686	0.3 (0.0-0.7)
												NR			NR	NR	NR								
Major salivary glands (not parotid) (C080-C089)																									
M																			**0**						
F												<5							**<5**	**0.1**	0 - 0.2	100.0	0.0	*	0.1 (0 - 0.2)
												NR													
Pharynx (C090-C149) (not C11)																									
M								<5	<5	9	7	9	14	5	9	<5	<5	<5	**63**	**3.9**	2.9-4.8	95.0	0.5	204	5.2 (3.9-6.5)
								NR	NR	10.7	8.8	12.9	22.1	10.9	27.1	NR	NR	NR							
F					<5				<5	<5	<5	<5			<5	<5	<5		**14**	**0.8**	0.4-1.2	93.0	0.1	1247	1.2 (0.6-1.8)
					NR				NR	NR	NR	NR			NR	NR	NR								
Nasopharynx (C110-C119)																									
M								<5				<5	<5		<5				**<5**	**0.3**	0.0-0.5	100.0	0.0	2781	0.3 (0.0-0.7)
								NR				NR	NR		NR										
F												<5	<5	<5					**<5**	**0.2**	0 - 0.4	100.0	0.0	3832	0.2 (0 - 0.5)
												NR	NR	NR											
Oesophagus (C150-C159)																									
M									<5	<5	9	11	14	9	14	15	10	9	**94**	**5.0**	4.0-6.1	94.0	0.6	175	8.6 (6.8-10.3)
									NR	NR	11.4	15.8	22.1	19.6	42.1	63.2	59.2	75.6							
F										<5	<5	<5	<5	<5	<5	<5	<5	6	**25**	**1.1**	0.6-1.6	96.0	0.1	881	1.9 (1.2-2.7)
										NR	NR	NR	NR	NR	NR	NR	NR	26.4							
Stomach (C160-C169)																									
M				<5			<5		<5	<5	13	10	15	20	20	17	18	16	**137**	**7.4**	6.1-8.7	97.0	0.8	120	12.6 (10.5-14.7)
				NR			NR		NR	NR	16.4	14.3	23.7	43.5	60.1	71.7	106.6	134.3							
F								<5	<5	<5	6	6	<5	12	7	6	6	14	**64**	**3.0**	2.2-3.9	88.0	0.4	278	5.0 (3.7-6.2)
								NR	NR	NR	7.6	8.5	NR	26.5	19.9	21.5	26.7	61.7							
Small intestine (C170-C179)																									
M								<5	<5	<5	<5	<5	<5		<5	<5	<5	<5	**22**	**1.3**	0.7-1.8	100.0	0.2	640	1.9 (1.1-2.7)
								NR	NR	NR	NR	NR	NR		NR	NR	NR	NR							
F									<5		<5	<5	<5	5	<5	<5	<5	<5	**20**	**1.1**	0.6-1.6	95.0	0.1	722	1.6 (0.9-2.2)
									NR		NR	NR	NR	11.0	NR	NR	NR	NR							

Appendix 3A. Cancer incidence, Western Australia, 2011

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
Colorectal cancer (C18-C20, C218)																									
M				<5	<5	6	9	6	23	31	45	75	113	111	108	98	84	63	**775**	**42.9**	39.8-46.0	98.0	5.0	21	69.5 (64.5-74.4)
				NR	NR	6.2	10.6	7.0	26.3	36.7	56.9	107.6	178.7	241.7	324.7	413.1	497.2	528.9							
F				<5	<5	<5	7	7	15	12	41	72	64	68	87	75	74	89	**616**	**29.9**	27.4-32.5	94.0	3.5	29	48.7 (44.9-52.6)
				NR	NR	NR	8.6	8.4	17.5	14.5	52.0	102.3	101.9	150.0	247.8	268.7	329.5	392.3							
Colon (C180-C189)																									
M				<5	<5	<5	9	<5	14	13	25	36	63	76	65	63	56	46	**475**	**26.0**	23.6-28.4	97.0	3.0	34	43.1 (39.2-47.0)
				NR	NR	NR	10.6	NR	16.0	15.4	31.6	51.6	99.7	165.5	195.4	265.6	331.5	386.2							
F				<5	<5	<5	5	5	9	6	22	46	42	43	56	53	56	72	**419**	**19.6**	17.6-21.7	92.0	2.2	45	32.9 (29.7-36.1)
				NR	NR	NR	6.1	6.0	10.5	7.2	27.9	65.4	66.9	94.9	159.5	189.9	249.4	317.3							
Rectosigmoid junction & rectum (C190-C209)																									
M					<5	<5		<5	9	18	20	39	50	35	42	35	28	17	**299**	**16.9**	14.9-18.8	98.0	2.0	50	26.3 (23.2-29.3)
					NR	NR		NR	10.3	21.3	25.3	55.9	79.1	76.2	126.3	147.5	165.7	142.7							
F						<5	<5	<5	6	6	19	26	22	23	29	21	17	17	**191**	**10.0**	8.5-11.5	98.0	1.2	81	15.3 (13.1-17.5)
						NR	NR	NR	7.0	7.2	24.1	36.9	35.0	50.7	82.6	75.2	75.7	74.9							
Anus (C210-C219)																									
M											<5	<5	<5	<5	<5	<5	<5		**9**	**0.5**	0.2-0.8	100.0	0.1	1719	0.8 (0.3-1.3)
											NR	NR	NR	NR	NR	NR	NR								
F									<5	<5	<5		<5	<5	<5	<5	<5	<5	**20**	**1.1**	0.6-1.6	100.0	0.1	757	1.6 (0.9-2.3)
									NR	NR	NR		NR	NR	NR	NR	NR	NR							
Liver & intrahepatic bile ducts (C220-C229)																									
M							<5		<5	<5	12	13	11	7	10	13	7	8	**86**	**4.7**	3.7-5.7	57.0	0.5	196	7.8 (6.1-9.4)
							NR		NR	NR	15.2	18.6	17.4	15.2	30.1	54.8	41.4	67.2							
F	<5					<5	<5	<5	<5	<5	<5	5	5	<5	<5	7	<5	5	**39**	**2.2**	1.4-2.9	64.0	0.2	445	3.1 (2.1-4.1)
	NR					NR	NR	NR	NR	NR	NR	7.1	8.0	NR	NR	25.1	NR	22.0							
Gallbladder & bile ducts (C230-C249)																									
M										<5	<5	<5	<5	<5	6	8	6	7	**40**	**2.0**	1.4-2.6	83.0	0.2	511	3.9 (2.7-5.1)
										NR	NR	NR	NR	NR	18.0	33.7	35.5	58.8							
F									<5	<5	<5	<5	6	<5	5	10	8	6	**44**	**1.9**	1.3-2.5	77.0	0.2	539	3.5 (2.5-4.6)
									NR	NR	NR	NR	9.6	NR	14.2	35.8	35.6	26.4							
Pancreas (C250-C259)																									
M							<5		<5	<5	9	10	18	20	20	26	22	13	**145**	**7.6**	6.3-8.8	79.0	0.8	121	13.5 (11.2-15.7)
							NR		NR	NR	11.4	14.3	28.5	43.5	60.1	109.6	130.2	109.1							
F									<5	<5	<5	13	7	17	12	14	14	16	**100**	**4.6**	3.7-5.6	73.0	0.5	182	7.8 (6.3-9.4)
									NR	NR	NR	18.5	11.2	37.5	34.2	50.2	62.3	70.5							
Nasal cavity/sinuses, middle & inner ear (C300-C319)																									
M			<5		<5				<5	<5		<5		<5		<5	<5	<5	**13**	**0.8**	0.4-1.3	100.0	0.1	1686	1.2 (0.5-1.8)
			NR		NR				NR	NR		NR		NR		NR	NR	NR							
F												<5	<5	<5		<5			**<5**	**0.2**	0 - 0.4	100.0	0.0	3832	0.3 (0.0-0.6)
												NR	NR	NR		NR									
Larynx (C320-C329)																									
M										<5	<5	5	12	9	<5	<5	<5	<5	**40**	**2.3**	1.6-3.0	95.0	0.3	333	3.3 (2.3-4.3)
										NR	NR	7.2	19.0	19.6	NR	NR	NR	NR							
F									<5			<5		<5	<5		<5	<5	**NR**	**0.3**	0.0-0.5	83.0	0.0	2618	0.5 (0.1-0.8)
									NR			NR		NR	NR		NR	NR							

Appendix 3A. Cancer incidence, Western Australia, 2011

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
Lung, bronchus & trachea (C330-C349)																										
M							<5	<5	7	<5	28	46	77	90	96	97	83	65		**595**	**31.1**	28.5-33.7	88.0	3.6	28	55.2 (50.7-59.7)
							NR	NR	8.0	NR	35.4	66.0	121.8	196.0	288.6	408.9	491.3	545.7								
F			<5					<5	7	11	18	42	61	56	52	59	45	53		**407**	**19.9**	17.9-22.0	87.0	2.4	42	32.0 (28.9-35.2)
			NR					NR	8.2	13.3	22.8	59.7	97.2	123.5	148.1	211.4	200.4	233.6								
Thymus (C370-C379)																										
M									<5					<5	<5	<5				**<5**	**0.2**	0.0-0.5	100.0	0.0	3161	0.4 (0.0-0.7)
									NR					NR	NR	NR										
F									<5									<5		**<5**	**0.1**	0 - 0.2	100.0	0.0	*	0.1 (0 - 0.4)
									NR									NR								
Pleura, heart & mediastinum (C380-C389)																										
M					<5								<5							**<5**	**0.2**	0 - 0.4	100.0	0.0	7485	0.1 (0 - 0.3)
					NR								NR													
F			<5																	**<5**	**0.1**	0 - 0.4	100.0	0.0	*	0.1 (0 - 0.3)
			NR																							
Bones, joints & articular cartilages (C400-C419)																										
M	<5		<5	<5	<5	<5	<5	<5		5	<5		<5	<5	<5		<5			**24**	**2.0**	1.1-2.8	96.0	0.1	680	2.0 (1.2-2.8)
	NR		NR	NR	NR	NR	NR	NR		5.9	NR		NR	NR	NR		NR									
F		<5		<5	<5	<5		<5	<5				<5		<5					**10**	**0.8**	0.3-1.4	100.0	0.1	1332	0.8 (0.3-1.3)
		NR		NR	NR	NR		NR	NR				NR		NR											
Skin (melanoma only) (C440-C449; M-8720 - 8790)																										
M	<5			<5	NR	13	13	23	30	42	62	66	97	75	71	68	64	41		**672**	**38.8**	35.8-41.9	100.0	4.3	24	59.1 (54.5-63.6)
	NR			NR	5.5	13.5	15.3	26.9	34.3	49.8	78.3	94.7	153.4	163.3	213.5	286.6	378.9	344.2								
F				<5	NR	9	9	32	33	35	43	43	45	51	31	30	31	44		**443**	**25.2**	22.7-27.7	100.0	2.7	38	35.6 (32.2-38.9)
				NR	7.0	10.2	11.0	38.4	38.5	42.2	54.6	61.1	71.7	112.5	88.3	107.5	138.0	193.9								
Skin (not melanoma/SCC/BCC) (C440-C449)																										
M						<5			<5	<5	<5	5	6	10	5	17	8	<5		**64**	**3.4**	2.5-4.2	95.0	0.3	313	5.9 (4.5-7.4)
						NR			NR	NR	NR	7.2	9.5	21.8	15.0	71.7	47.4	NR								
F	<5				<5				<5			<5	<5	5	12	5	<5	7		**40**	**2.1**	1.4-2.8	90.0	0.3	347	3.2 (2.2-4.3)
	NR				NR				NR			NR	NR	11.0	34.2	17.9	NR	30.9								
Mesothelioma (M905; ICD10 C45)																										
M									<5	<5	<5	<5	11	15	17	21	11	6		**90**	**4.7**	3.7-5.7	98.0	0.6	178	8.5 (6.7-10.2)
									NR	NR	NR	NR	17.4	32.7	51.1	88.5	65.1	50.4								
F													<5	7		<5	<5	<5		**12**	**0.7**	0.3-1.1	92.0	0.1	1074	0.9 (0.4-1.4)
													NR	15.4		NR	NR	NR								
Kaposi sarcoma (M914; ICD10 C46)																										
M												<5	<5				<5			**<5**	**0.2**	0 - 0.3	100.0	0.0	6631	0.2 (0 - 0.5)
												NR	NR				NR									
F																	<5			**<5**	**0.0**	0 - 0.1	100.0	0.0	*	0.1 (0 - 0.2)
																	NR									
Nervous system, peripheral/autonomic (C470-C479)																										
M											<5									**<5**	**0.1**	0 - 0.2	100.0	0.0	*	0.1 (0 - 0.3)
											NR															
F											<5		<5							**<5**	**0.1**	0 - 0.3	100.0	0.0	6990	0.2 (0 - 0.4)
											NR		NR													

Appendix 3A. Cancer incidence, Western Australia, 2011

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
Retroperitoneum and peritoneum (C480-C489)																										
M				<5											<5					**<5**	**0.2**	0 - 0.4	50.0	0.0	4687	0.2 (0 - 0.4)
				NR											NR											
F										<5	<5	<5	<5			<5	<5			**9**	**0.4**	0.1-0.7	89.0	0.0	2825	0.7 (0.2-1.2)
										NR	NR	NR	NR			NR	NR									
Connective, subcutaneous & other soft tissues (C490-C499)																										
M	<5	<5				<5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5			**28**	**1.9**	1.1-2.7	100.0	0.2	559	2.4 (1.5-3.3)
	NR	NR				NR		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR									
F	<5					<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		**28**	**1.9**	1.1-2.6	96.0	0.2	558	2.4 (1.5-3.2)
	NR					NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR								
Breast (C500-C509)																										
M												<5	<5	<5	<5	<5		<5		**7**	**0.4**	0.1-0.7	100.0	0.1	1785	0.6 (0.2-1.1)
												NR	NR	NR	NR	NR		NR								
F					<5	8	23	38	93	171	193	170	195	158	129	85	78	80		**1423**	**82.9**	78.5-87.4	99.0	9.6	11	114.5 (108-120)
					NR	9.1	28.2	45.6	108.6	206.2	244.9	241.5	310.6	348.5	367.4	304.6	347.3	352.6								
Vulva (C510-C519)																										
F							<5		<5	<5	<5	<5	<5	<5	<5	9	<5	6		**40**	**1.9**	1.3-2.6	98.0	0.2	534	3.2 (2.2-4.3)
							NR		NR	NR	NR	NR	NR	NR	NR	32.2	NR	26.4								
Vagina (C520-C529)																										
F									<5		<5	<5	<5	<5				<5		**9**	**0.4**	0.1-0.8	100.0	0.0	2204	0.6 (0.2-1.1)
									NR		NR	NR	NR	NR				NR								
Cervix uteri (C530-C539)																										
F						6	8	11	7	10	8	<5	<5	5	<5	<5	<5	<5		**71**	**4.6**	3.5-5.8	97.0	0.4	230	6.0 (4.6-7.4)
						6.8	9.8	13.2	8.2	12.1	10.1	NR	NR	11.0	NR	NR	NR	NR								
Corpus uteri (C540-C549)																										
F					<5			<5	6	10	25	29	35	40	11	22	25	8		**216**	**11.8**	10.1-13.4	100.0	1.4	74	17.1 (14.8-19.4)
					NR			NR	7.0	12.1	31.7	41.2	55.8	88.2	31.3	78.8	111.3	35.3								
Uterus, nos (C550-C559)																										
F																				**0**						
Ovary (C560-C569)																										
F			<5		<5	<5	<5	<5	<5	7	13	8	20	27	6	12	11	15		**133**	**7.3**	6.0-8.6	93.0	0.8	124	10.4 (8.7-12.2)
			NR		NR	NR	NR	NR	NR	8.4	16.5	11.4	31.9	59.6	17.1	43.0	49.0	66.1								
Uterine adnexa & oth. fem gen. (C570-C579)																										
F										<5		<5	<5	<5	<5	<5	<5	<5		**16**	**0.8**	0.4-1.2	94.0	0.1	1094	1.3 (0.6-1.9)
										NR		NR	NR	NR	NR	NR	NR	NR								
Placenta (C580-C589)																										
F							<5													**<5**	**0.1**	0 - 0.2	100.0	0.0	*	0.1 (0 - 0.3)
							NR																			
Penis (C600-C609)																										
M						<5				<5		<5	<5		<5	<5	<5			**NR**	**0.4**	0.1-0.7	100.0	0.0	2427	0.6 (0.2-1.1)
						NR				NR		NR	NR		NR	NR	NR									
Prostate gland (C610-C619)																										
M			<5					<5	13	47	113	273	421	459	299	231	128	99		**2086**	**119.6**	114-125	98.0	15.9	7	178.4 (171-186)
			NR					NR	14.9	55.7	142.8	391.6	665.9	999.4	898.9	973.7	757.7	831.2								
Testis (C620-C629)																										
M				<5	16	16	6	13	11	5	7	<5	<5	<5		<5		<5		**85**	**6.4**	5.0-7.8	98.0	0.5	210	7.0 (5.5-8.5)
				NR	17.4	16.6	7.1	15.2	12.6	5.9	8.8	NR	NR	NR		NR		NR								

Appendix 3A. Cancer incidence, Western Australia, 2011

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
Other male genital (C630-C639)																									
M												<5							**<5**	**0.1**	0 - 0.2	100.0	0.0	*	0.1 (0 - 0.2)
												NR													
Kidney (C640-C649)																									
M	<5	<5					<5	5	6	16	32	31	30	26	24	17	10	6	**210**	**12.8**	11.0-14.6	95.0	1.5	67	17.9 (15.5-20.4)
	NR	NR					NR	5.8	6.9	19.0	40.4	44.5	47.5	56.6	72.2	71.7	59.2	50.4							
F	<5	<5				<5			5	10	8	19	16	7	14	9	9	<5	**108**	**6.5**	5.2-7.9	96.0	0.7	138	8.7 (7.1-10.4)
	NR	NR				NR			5.8	12.1	10.1	27.0	25.5	15.4	39.9	32.2	40.1	NR							
Bladder & urinary tract (C650-C689)																									
M								<5	<5	<5	<5	9	20	18	30	28	30	24	**167**	**8.4**	7.1-9.7	93.0	0.9	109	16.0 (13.5-18.4)
								NR	NR	NR	NR	12.9	31.6	39.2	90.2	118.0	177.6	201.5							
F								<5	<5		<5	6	<5	7	10	6	12	17	**65**	**2.7**	2.0-3.4	89.0	0.3	321	5.0 (3.7-6.2)
								NR	NR		NR	8.5	NR	15.4	28.5	21.5	53.4	74.9							
Eye & lacrimal gland (C690-C699)																									
M		<5								<5		<5	<5	<5	<5	<5	<5	<5	**15**	**0.9**	0.4-1.5	80.0	0.1	860	1.3 (0.6-2.0)
		NR								NR		NR	NR	NR	NR	NR	NR	NR							
F	5									<5		<5	<5	<5	<5	<5		<5	**14**	**1.3**	0.5-2.0	86.0	0.1	1029	1.1 (0.5-1.7)
	6.5									NR		NR	NR	NR	NR	NR		NR							
Meninges (cerebral & spinal) (C700-C709)																									
M													<5						**<5**	**0.1**	0 - 0.2	100.0	0.0	*	0.1 (0 - 0.2)
													NR												
F								<5						<5				<5	**<5**	**0.2**	0 - 0.4	67.0	0.0	5873	0.2 (0 - 0.5)
								NR						NR				NR							
Brain (C710-C719)																									
M	<5	<5		<5	<5	<5	5	<5	5	7	5	13	9	15	5	11	<5	<5	**97**	**6.4**	5.0-7.7	91.0	0.6	161	8.3 (6.7-10.0)
	NR	NR		NR	NR	NR	5.9	NR	5.7	8.3	6.3	18.6	14.2	32.7	15.0	46.4	NR	NR							
F	<5	<5		<5		<5	<5	<5	5	5	6	5	6	8	5	6	5	<5	**66**	**4.0**	3.0-5.1	80.0	0.4	246	5.4 (4.1-6.7)
	NR	NR		NR		NR	NR	NR	5.8	6.0	7.6	7.1	9.6	17.6	14.2	21.5	22.3	NR							
Spinal cord & cranial nerves (C720-C729)																									
M																			**0**						
F												<5		<5					**<5**	**0.1**	0 - 0.3	100.0	0.0	5515	0.2 (0 - 0.4)
												NR		NR											
Thyroid gland (C730-C739)																									
M			<5	<5	<5	6	<5	6	<5	11	6	5	<5	<5	<5	<5	6	<5	**65**	**4.3**	3.2-5.4	100.0	0.4	267	5.6 (4.2-6.9)
			NR	NR	NR	6.2	NR	7.0	NR	13.0	7.6	7.2	NR	NR	NR	NR	35.5	NR							
F				<5	<5	9	20	20	21	27	27	14	10	14	10	<5	<5	<5	**184**	**12.5**	10.7-14.3	99.0	1.3	80	15.6 (13.3-17.8)
				NR	NR	10.2	24.6	24.0	24.5	32.6	34.3	19.9	15.9	30.9	28.5	NR	NR	NR							
Adrenal gland (C740-C749)																									
M	<5					<5		<5		<5					<5				**NR**	**0.4**	0.0-0.8	100.0	0.0	2615	0.4 (0.1-0.8)
	NR					NR		NR		NR					NR										
F		<5									<5			<5		<5		<5	**6**	**0.3**	0.0-0.7	83.0	0.0	4108	0.5 (0.1-0.9)
		NR									NR			NR		NR		NR							
Endocrine glands (not adrenal) (C750-C759)																									
M					<5	<5													**<5**	**0.2**	0 - 0.4	100.0	0.0	9404	0.1 (0 - 0.4)
					NR	NR																			
F													<5						**<5**	**0.1**	0 - 0.3	100.0	0.0	6278	0.1 (0 - 0.3)
													NR												

Appendix 3A. Cancer incidence, Western Australia, 2011

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																										
Lymphoma, NOS / unclassifiable																										
M													<5		<5	<5		<5		**7**	**0.4**	0.1-0.7	71.0	0.0	2180	0.7 (0.2-1.2)
													NR		NR	NR		NR								
F																<5	<5	<5		**6**	**0.1**	0.0-0.3	83.0	0.0	*	0.5 (0.1-0.8)
																NR	NR	NR								
Hodgkin lymphoma																										
M		<5		<5	6	5	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5			**38**	**3.0**	2.0-4.0	100.0	0.3	391	3.1 (2.1-4.1)
		NR		NR	6.5	5.2	NR	NR	NR	NR	NR	NR	NR	NR	NR		NR									
F		<5	<5	<5	<5	<5	<5		5	<5		<5	<5	<5						**24**	**2.0**	1.2-2.8	100.0	0.2	636	2.0 (1.2-2.8)
		NR	NR	NR	NR	NR	NR		5.8	NR		NR	NR	NR												
All NHL																										
M	<5	<5	<5	<5	<5	8	7	6	8	10	19	32	29	35	24	32	25	10		**254**	**15.0**	13.1-16.9	99.0	1.6	63	22.3 (19.5-25.1)
	NR	NR	NR	NR	NR	8.3	8.3	7.0	9.2	11.8	24.0	45.9	45.9	76.2	72.2	134.9	148.0	84.0								
F		<5	<5		<5	<5	<5	<5	6	15	9	23	25	23	23	26	20	15		**197**	**10.6**	9.0-12.2	99.0	1.2	84	15.9 (13.7-18.1)
		NR	NR		NR	NR	NR	NR	7.0	18.1	11.4	32.7	39.8	50.7	65.5	93.2	89.1	66.1								
NHL, mature B cell																										
M	<5		<5	<5	<5	5	5	5	6	8	16	22	19	23	14	24	18	6		**176**	**10.3**	8.7-11.9	99.0	1.1	94	15.5 (13.2-17.8)
	NR		NR	NR	NR	5.2	5.9	5.8	6.9	9.5	20.2	31.6	30.1	50.1	42.1	101.2	106.6	50.4								
F			<5		<5	<5	<5	<5	6	12	7	15	17	17	14	21	16	11		**146**	**7.8**	6.5-9.2	100.0	0.8	119	11.8 (9.9-13.8)
			NR		NR	NR	NR	NR	7.0	14.5	8.9	21.3	27.1	37.5	39.9	75.2	71.3	48.5								
NHL, mature T/NK cell																										
M				<5		<5	<5		<5			6	<5	6	<5	<5	<5	<5		**25**	**1.5**	0.9-2.1	100.0	0.2	540	2.1 (1.2-2.9)
				NR		NR	NR		NR			8.6	NR	13.1	NR	NR	NR	NR								
F		<5						<5		<5	<5	<5	<5	<5	<5	<5				**15**	**1.0**	0.5-1.5	100.0	0.1	771	1.3 (0.6-1.9)
		NR						NR		NR	NR	NR	NR	NR	NR	NR										
NHL, precursor cell lymphoblastic																										
M		<5			<5	<5			<5					<5						**6**	**0.6**	0.1-1.1	100.0	0.0	2458	0.5 (0.1-0.9)
		NR			NR	NR			NR					NR												
F																				**0**						
NHL, other/unclassifiable																										
M						<5	<5	<5		<5	<5	<5	7	5	8	7	5	<5		**47**	**2.6**	1.8-3.4	100.0	0.3	327	4.3 (3.0-5.5)
						NR	NR	NR		NR	NR	NR	11.1	10.9	24.1	29.5	29.6	NR								
F										<5	<5	<5	7	5	5	<5	<5	<5		**36**	**1.8**	1.2-2.4	97.0	0.2	437	2.8 (1.9-3.7)
										NR	NR	NR	11.2	11.0	14.2	NR	NR	NR								
Lymphomas (all)																										
M	<5	<5	<5	6	8	13	11	8	9	12	21	35	33	36	29	34	26	11		**299**	**18.4**	16.2-20.6	99.0	1.9	53	26.1 (23.1-29.1)
	NR	NR	NR	7.6	8.7	13.5	13.0	9.4	10.3	14.2	26.5	50.2	52.2	78.4	87.2	143.3	153.9	92.4								
F		<5	<5	<5	<5	<5	5	<5	11	18	9	24	28	24	23	27	24	16		**227**	**12.7**	10.9-14.5	99.0	1.4	74	18.4 (16.0-20.8)
		NR	NR	NR	NR	NR	6.1	NR	12.8	21.7	11.4	34.1	44.6	52.9	65.5	96.7	106.9	70.5								
MYELOMA																										
Myeloma/plasma cell tumours																										
M							<5			NR	7	13	13	11	14	11	12	8		**95**	**5.2**	4.1-6.2	95.0	0.6	166	8.5 (6.8-10.3)
							NR			5.9	8.8	18.6	20.6	24.0	42.1	46.4	71.0	67.2								
F					<5					<5	NR	7	10	9	11	6	10	11		**72**	**3.5**	2.6-4.3	93.0	0.4	230	5.6 (4.3-6.9)
					NR					NR	7.6	9.9	15.9	19.9	31.3	21.5	44.5	48.5								

Appendix 3A. Cancer incidence, Western Australia, 2011

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																									
Leukaemias, NOS/unclassifiable																									
M														<5	<5		<5	<5	**5**	**0.3**	0.0-0.5	60.0	0.0	2443	0.5 (0.1-0.9)
														NR	NR		NR	NR							
F						<5											<5	<5	**<5**	**0.1**	0 - 0.3	100.0	0.0	*	0.2 (0 - 0.5)
						NR											NR	NR							
Leukaemias, lymphoid, all																									
M	5	<5		<5	<5		<5	<5	<5	<5	11	9	9	15	9	13	15	<5	**103**	**6.5**	5.1-7.8	99.0	0.6	162	9.2 (7.4-11.0)
	6.3	NR		NR	NR		NR	NR	NR	NR	13.9	12.9	14.2	32.7	27.1	54.8	88.8	NR							
F	7	<5	<5			<5			<5	<5	<5	8	8	6	14	<5	9	8	**71**	**4.5**	3.3-5.7	99.0	0.5	208	5.7 (4.3-7.0)
	9.2	NR	NR			NR			NR	NR	NR	11.4	12.7	13.2	39.9	NR	40.1	35.3							
Leukaemias, lymphoid, acute																									
M	5	<5		<5	<5			<5	<5			<5	<5		<5				**16**	**1.8**	0.9-2.7	100.0	0.1	896	1.4 (0.7-2.0)
	6.3	NR		NR	NR			NR	NR			NR	NR		NR										
F	7	<5	<5			<5			<5			<5	<5						**16**	**1.9**	0.9-2.9	100.0	0.1	924	1.3 (0.7-2.0)
	9.2	NR	NR			NR			NR			NR	NR												
Leukaemias, lymphoid, chronic																									
M							<5	<5	<5	<5	9	7	7	15	7	12	9	<5	**75**	**4.1**	3.2-5.1	99.0	0.5	215	6.7 (5.2-8.3)
							NR	NR	NR	NR	11.4	10.0	11.1	32.7	21.0	50.6	53.3	NR							
F										<5	<5	6	6	6	14	<5	7	7	**51**	**2.5**	1.7-3.2	98.0	0.4	272	4.0 (2.9-5.2)
										NR	NR	8.5	9.6	13.2	39.9	NR	31.2	30.9							
Leukaemias, lymphoid, other/NOS																									
M											<5	<5	<5		<5	<5	6		**12**	**0.5**	0.2-0.8	100.0	0.0	2340	1.1 (0.5-1.8)
											NR	NR	NR		NR	NR	35.5								
F										<5							<5	<5	**<5**	**0.1**	0 - 0.3	100.0	0.0	*	0.3 (0.0-0.6)
										NR							NR	NR							
Leukaemias, myeloid, all																									
M	<5		<5	<5	<5		<5	<5	6	6	5	7	9	9	6	9	7	9	**84**	**5.2**	4.0-6.4	98.0	0.5	210	7.6 (5.9-9.2)
	NR		NR	NR	NR		NR	NR	6.9	7.1	6.3	10.0	14.2	19.6	18.0	37.9	41.4	75.6							
F				<5	<5	<5	<5	<5	<5	<5	<5	<5	9	<5	10	7	13	6	**68**	**3.5**	2.6-4.4	100.0	0.4	269	5.5 (4.2-6.8)
				NR	NR	NR	NR	NR	NR	NR	NR	NR	14.3	NR	28.5	25.1	57.9	26.4							
Leukaemias, myeloid, acute																									
M	<5		<5	<5	<5		<5	<5	5	<5	<5	7	6	6	<5	7	<5	6	**58**	**3.7**	2.7-4.8	100.0	0.3	310	5.2 (3.8-6.5)
	NR		NR	NR	NR		NR	NR	5.7	NR	NR	10.0	9.5	13.1	NR	29.5	NR	50.4							
F					<5			<5	<5	<5	<5	<5	6	<5	7	<5	7	<5	**41**	**2.0**	1.4-2.7	100.0	0.2	417	3.3 (2.3-4.3)
					NR			NR	NR	NR	NR	NR	9.6	NR	19.9	NR	31.2	NR							
Leukaemias, myeloid, chronic																									
M								<5	<5	<5	<5			<5	<5	<5	<5	<5	**15**	**0.9**	0.4-1.4	93.0	0.1	1105	1.3 (0.7-2.0)
								NR	NR	NR	NR			NR	NR	NR	NR	NR							
F				<5		<5	<5	<5	<5		<5		<5		<5	<5	<5		**16**	**1.1**	0.5-1.6	100.0	0.1	937	1.4 (0.7-2.0)
				NR		NR	NR	NR	NR		NR		NR		NR	NR	NR								
Leukaemias, myeloid, other/NOS																									
M													<5	<5	<5	<5	<5	<5	**11**	**0.6**	0.2-0.9	91.0	0.1	1547	1.0 (0.4-1.6)
													NR	NR	NR	NR	NR	NR							
F														<5	<5	<5	5	<5	**11**	**0.4**	0.1-0.6	100.0	0.0	3958	0.9 (0.3-1.4)
														NR	NR	NR	22.3	NR							

Appendix 3A. Cancer incidence, Western Australia, 2011

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, other																									
M																			**0**						
F																			**0**						
Leukaemias (all)																									
M	8	<5	<5	<5	<5		<5	5	8	9	16	16	18	25	17	22	23	13	**192**	**11.9**	10.1-13.8	97.0	1.1	88	17.2 (14.8-19.7)
	10.0	NR	NR	NR	NR		NR	5.8	9.2	10.7	20.2	23.0	28.5	54.4	51.1	92.7	136.2	109.1							
F	7	<5	<5	<5	<5	<5	<5	<5	5	<5	<5	12	17	9	24	10	23	15	**142**	**8.1**	6.6-9.6	99.0	0.9	117	11.4 (9.5-13.3)
	9.2	NR	NR	NR	NR	NR	NR	NR	5.8	NR	NR	17.0	27.1	19.9	68.3	35.8	102.4	66.1							
MYELODYSPLASTIC DISEASES																									
Refractory anaemias/cytopaenias																									
M					<5							<5	5	<5	<5	7	5	9	**35**	**1.7**	1.1-2.3	100.0	0.1	711	3.4 (2.3-4.6)
					NR							NR	7.9	NR	NR	29.5	29.6	75.6							
F												<5	<5	<5		<5	<5	6	**14**	**0.5**	0.2-0.8	100.0	0.0	2694	1.0 (0.5-1.5)
												NR	NR	NR		NR	NR	26.4							
Myelodysplastic syndromes																									
M												<5	<5	5	5	7	11	13	**44**	**2.0**	1.4-2.6	86.0	0.2	656	4.5 (3.1-5.8)
												NR	NR	10.9	15	29.5	65.1	109.1							
F											<5		<5	<5	<5	<5	<5	10	**24**	**0.9**	0.5-1.2	88.0	0.1	1316	1.8 (1.1-2.5)
											NR		NR	NR	NR	NR	NR	44.1							
Myelodysplastic diseases, all																									
M					<5							<5	7	9	8	14	16	22	**79**	**3.7**	2.9-4.5	92.0	0.3	341	7.9 (6.1-9.6)
					NR							NR	11.1	19.6	24.1	59.0	94.7	184.7							
F											<5	<5	<5	<5	<5	6	5	16	**38**	**1.4**	0.9-1.8	92.0	0.1	884	2.8 (1.9-3.7)
											NR	NR	NR	NR	NR	21.5	22.3	70.5							
CHRONIC MYELOPROLIFERATIVE DISEASES																									
Chronic myeloproliferative disorder, NOS																									
M														<5	<5	<5			**<5**	**0.2**	0 - 0.4	100.0	0.0	3859	0.3 (0 - 0.6)
														NR	NR	NR									
F																		<5	**<5**	**0.0**	0 - 0.1	100.0	0.0	*	0.1 (0 - 0.2)
																		NR							
Polycythaemia rubra vera																									
M								<5	<5	<5		<5	<5	<5		<5	<5	<5	**12**	**0.7**	0.3-1.1	100.0	0.1	1570	1.0 (0.4-1.6)
								NR	NR	NR		NR	NR	NR		NR	NR	NR							
F												<5					<5	<5	**5**	**0.1**	0.0-0.3	60.0	0.0	*	0.3 (0.0-0.7)
												NR					NR	NR							
Myelofibrosis/sclerosis																									
M												<5			<5				**<5**	**0.2**	0.0-0.5	100.0	0.0	2252	0.3 (0.0-0.7)
												NR			NR										
F													<5	<5				<5	**<5**	**0.2**	0 - 0.3	100.0	0.0	5265	0.2 (0 - 0.4)
													NR	NR				NR							
Other chronic myeloproliferative d/o																									
M								<5		<5		<5		<5	<5	<5	<5	<5	**17**	**0.9**	0.5-1.3	100.0	0.1	1194	1.6 (0.9-2.4)
								NR		NR		NR		NR	NR	NR	NR	NR							
F						<5	<5			<5	<5	<5		<5	<5	5	<5	<5	**18**	**0.9**	0.4-1.3	83.0	0.1	1340	1.5 (0.8-2.2)
						NR	NR			NR	NR	NR		NR	NR	17.9	NR	NR							

Appendix 3A. Cancer incidence, Western Australia, 2011

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
Chronic myeloproliferative d/o, all																									
M								<5	<5	<5		7	<5	<5	5	5	<5	<5	**36**	**2.0**	1.3-2.7	100.0	0.2	460	3.3 (2.2-4.4)
								NR	NR	NR		10.0	NR	NR	15.0	21.1	NR	NR							
F						<5	<5			<5	<5	<5	<5	<5	<5	5	<5	7	**27**	**1.2**	0.7-1.7	81.0	0.1	993	2.1 (1.3-2.9)
						NR	NR			NR	NR	NR	NR	NR	NR	17.9	NR	30.9							
OTHER CHRONIC IMMUNOPROLIFERATIVE DISEASES																									
Mast cell tumours																									
M																	<5		**<5**	**0.0**	0 - 0.1	100.0	0.0	*	0.1 (0 - 0.3)
																	NR								
F																			**0**						
Histiocytic/dendritic cell malignancies																									
M										<5						<5			**<5**	**0.1**	0 - 0.3	100.0	0.0	*	0.2 (0 - 0.5)
										NR						NR									
F																			**0**						
Other & U/S immunoproliferative neoplasms																									
M											<5					<5	<5		**<5**	**0.2**	0 - 0.3	100.0	0.0	*	0.4 (0.0-0.8)
											NR					NR	NR								
F																			**0**						
Other chronic immunoproliferative d/o, all																									
M										<5	<5					<5	<5		**7**	**0.3**	0.1-0.5	100.0	0.0	8170	0.7 (0.2-1.2)
										NR	NR					NR	NR								
F																			**0**						
Unknown primary site (C26, C39, C76, C80; Behaviour 6/9)																									
M				<5					<5	<5	6	7	9	12	15	15	24	33	**130**	**6.4**	5.3-7.6	72.0	0.6	176	12.7 (10.5-14.9)
				NR					NR	NR	7.6	10.0	14.2	26.1	45.1	63.2	142.1	277.1							
F	<5							<5	<5	<5	NR	5	12	8	8	16	20	37	**116**	**4.6**	3.7-5.6	63.0	0.4	253	8.7 (7.1-10.3)
	NR							NR	NR	NR	7.6	7.1	19.1	17.6	22.8	57.3	89.1	163.1							
All cancers																									
M	21	12	11	22	45	68	64	90	147	256	436	701	1005	1030	859	807	620	477	**6671**	**379.9**	371-389	95.0	44.1	3	590.4 (576-605)
	26.3	16.1	14.5	27.7	49.1	70.5	75.5	105.3	168.1	303.2	550.9	1005.6	1589.7	2243	2582	3402	3670	4005							
F	21	9	7	8	26	53	85	144	230	351	448	524	589	573	496	457	439	505	**4965**	**270.9**	263-279	94.0	30.2	4	396.6 (386-408)
	27.5	12.5	9.6	10.6	30.5	60.0	104.3	172.8	268.6	423.3	568.4	744.5	938.2	1264	1413	1638	1955	2226							

Appendix 3A. Cancer incidence, Western Australia, 2011

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
Summary of most common cancer types 2011																										
Prostate gland (C610-C619)																										
M			<5					<5	13	47	113	273	421	459	299	231	128	99		**2086**	**119.6**	114-125	98.0	15.9	7	178.4 (171-186)
			NR					NR	14.9	55.7	142.8	391.6	665.9	999.4	898.9	973.7	757.7	831.2								
Breast (C500-C509)																										
M												<5	<5	<5	<5	<5		<5		**7**	**0.4**	0.1-0.7	100.0	0.1	1785	0.6 (0.2-1.1)
												NR	NR	NR	NR	NR		NR								
F					<5	8	23	38	93	171	193	170	195	158	129	85	78	80		**1423**	**82.9**	78.5-87.4	99.0	9.6	11	114.5 (108-120)
					NR	9.1	28.2	45.6	108.6	206.2	244.9	241.5	310.6	348.5	367.4	304.6	347.3	352.6								
Colorectal cancer (C18-C20, C218)																										
M				<5	<5	6	9	6	23	31	45	75	113	111	108	98	84	63		**775**	**42.9**	39.8-46.0	98.0	5.0	21	69.5 (64.5-74.4)
				NR	NR	6.2	10.6	7.0	26.3	36.7	56.9	107.6	178.7	241.7	324.7	413.1	497.2	528.9								
F				<5	<5	<5	7	7	15	12	41	72	64	68	87	75	74	89		**616**	**29.9**	27.4-32.5	94.0	3.5	29	48.7 (44.9-52.6)
				NR	NR	NR	8.6	8.4	17.5	14.5	52.0	102.3	101.9	150.0	247.8	268.7	329.5	392.3								
Skin (melanoma only) (C440-C449; M-8720 - 8774)																										
M	<5			<5	NR	13	13	23	30	42	62	66	97	75	71	68	64	41		**672**	**38.8**	35.8-41.9	100.0	4.3	24	59.1 (54.5-63.6)
	NR			NR	5.5	13.5	15.3	26.9	34.3	49.8	78.3	94.7	153.4	163.3	213.5	286.6	378.9	344.2								
F				<5	NR	9	9	32	33	35	43	43	45	51	31	30	31	44		**443**	**25.2**	22.7-27.7	100.0	2.7	38	35.6 (32.2-38.9)
				NR	7.0	10.2	11.0	38.4	38.5	42.2	54.6	61.1	71.7	112.5	88.3	107.5	138.0	193.9								
Lung, bronchus & trachea (C330-C349)																										
M							<5	<5	7	<5	28	46	77	90	96	97	83	65		**595**	**31.1**	28.5-33.7	88.0	3.6	28	55.2 (50.7-59.7)
							NR	NR	8.0	NR	35.4	66.0	121.8	196.0	288.6	408.9	491.3	545.7								
F			<5					<5	7	11	18	42	61	56	52	59	45	53		**407**	**19.9**	17.9-22.0	87.0	2.4	42	32.0 (28.9-35.2)
			NR					NR	8.2	13.3	22.8	59.7	97.2	123.5	148.1	211.4	200.4	233.6								
Lymphomas (all)																										
M	<5	<5	<5	6	8	13	11	8	9	12	21	35	33	36	29	34	26	11		**299**	**18.4**	16.2-20.6	99.0	1.9	53	26.1 (23.1-29.1)
	NR	NR	NR	7.6	8.7	13.5	13.0	9.4	10.3	14.2	26.5	50.2	52.2	78.4	87.2	143.3	153.9	92.4								
F		<5	<5	<5	<5	<5	5	<5	11	18	9	24	28	24	23	27	24	16		**227**	**12.7**	10.9-14.5	99.0	1.4	74	18.4 (16.0-20.8)
		NR	NR	NR	NR	NR	6.1	NR	12.8	21.7	11.4	34.1	44.6	52.9	65.5	96.7	106.9	70.5								
Unknown primary site (C26, C39, C76, C80; Behaviour 6/9)																										
M				<5					<5	<5	6	7	9	12	15	15	24	33		**130**	**6.4**	5.3-7.6	72.0	0.6	176	12.7 (10.5-14.9)
				NR					NR	NR	7.6	10.0	14.2	26.1	45.1	63.2	142.1	277.1								
F	<5							<5	<5	<5	6	NR	12	8	8	16	20	37		**116**	**4.6**	3.7-5.6	63.0	0.4	253	8.7 (7.1-10.3)
	NR							NR	NR	NR	7.6	7.1	19.1	17.6	22.8	57.3	89.1	163.1								
All cancers																										
M	21	12	11	22	45	68	64	90	147	256	436	701	1005	1030	859	807	620	477		**6671**	**379.9**	371-389	95.0	44.1	3	590.4 (576-605)
	26.3	16.1	14.5	27.7	49.1	70.5	75.5	105.3	168.1	303.2	550.9	1005.6	1589.7	2243	2582	3402	3670	4005								
F	21	9	7	8	26	53	85	144	230	351	448	524	589	573	496	457	439	505		**4965**	**270.9**	263-279	94.0	30.2	4	396.6 (386-408)
	27.5	12.5	9.6	10.6	30.5	60.0	104.3	172.8	268.6	423.3	568.4	744.5	938.2	1264	1413	1638	1955	2226								

Appendix 3B. Cancer mortality, Western Australia, 2011

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, gum & mouth (C000-C069) (not C01 C02)																									
M									1	1	2	1	4	2	1	2	2		**16**	**0.9**	0.5-1.4	175.9	0.1	1002	1.4 (0.7-2.0)
									1.1	1.2	2.5	1.4	6.3	4.4	3.0	8.4	11.8								
F										<5			<5			<5		<5	**5**	**0.2**	0.0-0.4	38.1	0.0	7146	0.4 (0.0-0.7)
										NR			NR			NR		NR							
Tongue (C010-C029)																									
M									<5	<5	<5	<5	<5	<5	<5		<5	<5	**16**	**1.0**	0.5-1.4	194.6	0.1	788	1.3 (0.7-2.0)
									NR	NR	NR	NR	NR	NR	NR		NR	NR							
F												<5					<5		**<5**	**0.1**	0 - 0.2	16.7	0.0	*	0.1 (0 - 0.4)
												NR					NR								
Parotid gland (C070-C079)																									
M										<5						<5			**<5**	**0.2**	0 - 0.3	25.4	0.0	*	0.3 (0 - 0.7)
										NR						NR									
F																		<5	**<5**	**0.0**	0 - 0.1	0.0	0.0	*	0.1 (0 - 0.2)
																		NR							
Major salivary glands (not parotid) (C080-C089)																									
M																			**0**					-	
F																	<5		**<5**	**0.0**	0 - 0.1	0.0	0.0	*	0.1 (0 - 0.2)
																	NR								
Pharynx (C090-C149) (not C11)																									
M										<5	<5	<5	6	<5	5	<5	<5	<5	**30**	**1.7**	1.1-2.3	252.5	0.2	507	2.7 (1.7-3.7)
										NR	NR	NR	9.5	NR	15.0	NR	NR	NR							
F										<5			<5			<5	<5		**6**	**0.3**	0.0-0.5	38.1	0.0	7146	0.5 (0.1-0.9)
										NR			NR			NR	NR								
Nasopharynx (C110-C119)																									
M									<5			<5	<5						**<5**	**0.2**	0.0-0.5	74.1	0.0	3575	0.3 (0.0-0.6)
									NR			NR	NR												
F											<5		<5			<5			**<5**	**0.2**	0 - 0.4	33.3	0.0	6990	0.2 (0 - 0.5)
											NR		NR			NR									
Oesophagus (C150-C159)																									
M									<5	<5	8	6	10	9	11	11	6	6	**73**	**4.0**	3.1-5.0	630.7	0.5	213	6.6 (5.1-8.1)
									NR	NR	10.1	8.6	15.8	19.6	33.1	46.4	35.5	50.4							
F										<5		<5	<5	<5		<5	<5	5	**16**	**0.6**	0.3-0.9	78.6	0.0	2549	1.2 (0.6-1.8)
										NR		NR	NR	NR		NR	NR	22.0							
Stomach (C160-C169)																									
M								<5	<5	<5	8	<5	11	9	9	15	16	13	**92**	**4.7**	3.7-5.7	654.0	0.4	228	8.7 (6.9-10.5)
								NR	NR	NR	10.1	NR	17.4	19.6	27.1	63.2	94.7	109.1							
F								<5	<5		<5	<5	<5	5	<5	<5	7	15	**42**	**1.7**	1.1-2.3	248.1	0.2	603	3.1 (2.1-4.0)
								NR	NR		NR	NR	NR	11.0	NR	NR	31.2	66.1							
Small intestine (C170-C179)																									
M											<5	<5	<5	<5	<5	<5	<5	<5	**14**	**0.8**	0.4-1.2	120.4	0.1	1090	1.2 (0.6-1.9)
											NR	NR	NR	NR	NR	NR	NR	NR							
F													<5	<5			<5	<5	**6**	**0.3**	0.0-0.6	33.4	0.0	2436	0.4 (0.1-0.8)
													NR	NR			NR	NR							

Appendix 3B. Cancer mortality, Western Australia, 2011

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
Colorectal cancer (C18-C20, C218)																									
M							<5	<5		<5	12	12	34	27	28	41	32	32	**224**	**11.5**	9.9-13.0	1282.6	1.2	85	21.1 (18.3-23.9)
							NR	NR		NR	15.2	17.2	53.8	58.8	84.2	172.8	189.4	268.7							
F							<5		<5	<5	7	10	12	19	16	23	37	64	**197**	**7.6**	6.5-8.8	905.6	0.7	143	14.8 (12.7-16.9)
							NR		NR	NR	8.9	14.2	19.1	41.9	45.6	82.4	164.8	282.1							
Colon (C180-C189)																									
M							<5	<5		<5	NR	7	22	17	16	25	25	22	**142**	**7.1**	5.9-8.3	730.4	0.7	144	13.4 (11.2-15.7)
							NR	NR		NR	6.3	10.0	34.8	37.0	48.1	105.4	148.0	184.7							
F									<5	<5	<5	8	9	14	10	11	29	50	**141**	**5.3**	4.4-6.3	623.1	0.5	206	10.3 (8.6-12.1)
									NR	NR	NR	11.4	14.3	30.9	28.5	39.4	129.1	220.4							
Rectosigmoid junction & rectum (C190-C209)																									
M								<5		<5	7	5	12	10	12	16	7	10	**82**	**4.4**	3.4-5.3	550.1	0.5	208	7.6 (6.0-9.3)
								NR		NR	8.8	7.2	19.0	21.8	36.1	67.4	41.4	84.0							
F							<5		<5	<5	<5	<5	<5	5	6	12	8	14	**56**	**2.3**	1.6-3.0	281.8	0.2	464	4.4 (3.2-5.6)
							NR		NR	NR	NR	NR	NR	11.0	17.1	43.0	35.6	61.7							
Anus (C210-C219)																									
M												<5			<5				**<5**	**0.2**	0 - 0.4	34.7	0.0	3405	0.2 (0 - 0.5)
												NR			NR										
F														<5	<5			<5	**<5**	**0.1**	0 - 0.3	9.6	0.0	3958	0.2 (0 - 0.5)
														NR	NR			NR							
Liver & intrahepatic bile ducts (C220-C229)																									
M										5	8	7	6	5	12	12	5	<5	**64**	**3.5**	2.6-4.4	539.8	0.4	243	5.9 (4.4-7.4)
										5.9	10.1	10.0	9.5	10.9	36.1	50.6	29.6	NR							
F								<5		<5		<5	<5	<5	6	<5	<5	5	**25**	**1.2**	0.7-1.7	179.2	0.2	639	2.0 (1.2-2.8)
								NR		NR		NR	NR	NR	17.1	NR	NR	22.0							
Gallbladder & bile ducts (C230-C249)																									
M										<5	<5	<5	<5	<5	<5	8	<5	<5	**28**	**1.4**	0.8-1.9	139.0	0.1	844	2.8 (1.7-3.8)
										NR	NR	NR	NR	NR	NR	33.7	NR	NR							
F											<5	<5	<5	<5	<5	9	5	7	**29**	**1.1**	0.6-1.5	81.1	0.1	1216	2.3 (1.5-3.2)
											NR	NR	NR	NR	NR	32.2	22.3	30.9							
Pancreas (C250-C259)																									
M							<5	<5		5	<5	8	10	16	10	21	16	11	**104**	**5.4**	4.3-6.4	701.6	0.5	188	9.7 (7.8-11.6)
							NR	NR		5.9	NR	11.5	15.8	34.8	30.1	88.5	94.7	92.4							
F										<5	<5	<5	9	10	14	14	11	18	**82**	**3.5**	2.7-4.4	327.4	0.4	237	6.4 (5.0-7.8)
										NR	NR	NR	14.3	22.1	39.9	50.2	49.0	79.3							
Nasal cavity/sinuses, middle & inner ear (C300-C319)																									
M													<5	<5			<5		**<5**	**0.2**	0 - 0.3	18.6	0.0	5321	0.2 (0 - 0.5)
													NR	NR			NR								
F												<5					<5		**<5**	**0.1**	0 - 0.2	16.7	0.0	*	0.1 (0 - 0.4)
												NR					NR								
Larynx (C320-C329)																									
M													<5	<5	<5	<5	<5	<5	**13**	**0.6**	0.3-1.0	30.4	0.1	1674	1.3 (0.6-2.0)
													NR	NR	NR	NR	NR	NR							
F													<5	<5			<5		**<5**	**0.2**	0 - 0.3	19.1	0.0	5265	0.2 (0 - 0.5)
													NR	NR			NR								

Appendix 3B. Cancer mortality, Western Australia, 2011

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
Lung, bronchus & trachea (C330-C349)																									
M								<5	<5	6	22	33	50	59	76	65	78	70	**462**	**23.5**	21.3-25.7	2427.7	2.6	39	43.7 (39.6-47.7)
								NR	NR	7.1	27.8	47.3	79.1	128.5	228.5	274.0	461.7	587.7							
F									<5	6	17	30	30	38	40	34	42	53	**294**	**13.5**	11.9-15.2	1880.1	1.6	63	22.9 (20.2-25.5)
									NR	7.2	21.6	42.6	47.8	83.8	113.9	121.8	187.0	233.6							
Thymus (C370-C379)																									
M												<5			<5				**<5**	**0.2**	0 - 0.4	21.0	0.0	2686	0.3 (0 - 0.6)
												NR			NR										
F												<5	<5			<5			**<5**	**0.2**	0 - 0.3	28.6	0.0	6637	0.2 (0 - 0.5)
												NR	NR			NR									
Pleura, heart & mediastinum (C380-C389)																									
M														<5		<5			**<5**	**0.1**	0 - 0.3	7.0	0.0	9186	0.2 (0 - 0.5)
														NR		NR									
F															<5				**<5**	**0.1**	0 - 0.2	2.4	0.0	7024	0.1 (0 - 0.3)
															NR										
Bones, joints & articular cartilages (C400-C419)																									
M										<5							<5		**<5**	**0.1**	0 - 0.3	25.4	0.0	*	0.3 (0 - 0.6)
										NR							NR								
F																			**0**					-	
Skin (melanoma only) (C430-C439)																									
M						<5	<5	<5	<5	6	5	9	8	17	14	29	21	17	**134**	**6.9**	5.7-8.1	947.3	0.6	158	12.8 (10.6-15.0)
						NR	NR	NR	NR	7.1	6.3	12.9	12.7	37.0	42.1	122.2	124.3	142.7							
F							<5	<5	<5	<5	<5	<5	<5	<5	<5	7	6	12	**46**	**2.0**	1.4-2.6	393.9	0.2	575	3.6 (2.5-4.7)
							NR	NR	NR	NR	NR	NR	NR	NR	NR	25.1	26.7	52.9							
Skin (non-melanoma; includes SCC-BCC) (C440-C449)																									
M										<5		<5	<5	5	<5	9	8	10	**39**	**1.8**	1.2-2.4	139.1	0.1	892	3.9 (2.7-5.1)
										NR		NR	NR	10.9	NR	37.9	47.4	84.0							
F										<5				<5	<5	<5	<5	5	**14**	**0.6**	0.2-0.9	43.0	0.1	1352	1.1 (0.5-1.7)
										NR				NR	NR	NR	NR	22.0							
Mesothelioma (M905; ICD10 C45)																									
M											<5	<5	<5	15	14	24	13	9	**85**	**4.2**	3.3-5.1	291.2	0.4	224	8.3 (6.5-10.1)
											NR	NR	NR	32.7	42.1	101.2	77.0	75.6							
F												<5	<5	<5	<5			<5	**8**	**0.5**	0.1-0.8	54.9	0.1	1305	0.6 (0.2-1.1)
												NR	NR	NR	NR			NR							
Kaposi sarcoma (M914; ICD10 C46)																									
M																			**0**					-	
F																			**0**					-	
Nervous system, peripheral/autonomic (C470-C479)																									
M													<5		<5				**<5**	**0.1**	0 - 0.3	14.0	0.0	4360	0.2 (0 - 0.4)
													NR		NR										
F																			**0**					-	

Appendix 3B. Cancer mortality, Western Australia, 2011

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
Retroperitoneum and peritoneum (C480-C489)																									
M												<5 NR							**<5**	**0.1**	0 - 0.2	16.2	0.0	*	0.1 (0 - 0.2)
F									<5 NR		<5 NR		<5 NR	<5 NR		<5 NR	<5 NR		**13**	**0.7**	0.3-1.0	121.6	0.1	1786	1.1 (0.5-1.7)
Connective, subcutaneous & other soft tissues (C490-C499)																									
M		<5 NR			<5 NR						<5 NR			<5 NR	<5 NR	<5 NR	<5 NR		**9**	**0.6**	0.2-1.0	151.3	0.1	1809	0.8 (0.3-1.4)
F					<5 NR				<5 NR		<5 NR					<5 NR		<5 NR	**6**	**0.3**	0.0-0.6	124.7	0.0	4101	0.5 (0.1-0.9)
Breast (C500-C509)																									
M																			**0**					-	
F						<5 NR	<5 NR	NR 7.2	7 8.2	21 25.3	22 27.9	24 34.1	23 36.6	26 57.4	22 62.6	14 50.2	32 142.5	39 171.9	**238**	**11.9**	10.3-13.5	2462.1	1.3	77	18.5 (16.1-20.9)
Vulva (C510-C519)																									
F															<5 NR		<5 NR	<5 NR	**<5**	**0.1**	0 - 0.3	2.4	0.0	7024	0.3 (0.0-0.6)
Vagina (C520-C529)																									
F											<5 NR	<5 NR		<5 NR		<5 NR			**6**	**0.3**	0.1-0.6	61.9	0.0	3167	0.5 (0.1-0.9)
Cervix uteri (C530-C539)																									
F							<5 NR	<5 NR	<5 NR	<5 NR	<5 NR	<5 NR	<5 NR		5 14.2	<5 NR		<5 NR	**23**	**1.4**	0.8-1.9	377.2	0.2	591	1.9 (1.1-2.7)
Corpus uteri (C540-C549)																									
F										<5 NR	<5 NR	5 7.1	5 8.0	<5 NR	<5 NR	<5 NR	5 22.3	9 39.7	**39**	**1.8**	1.2-2.4	269.4	0.2	526	3.0 (2.0-3.9)
Uterus, nos (C550-C559)																									
F																			**0**					-	
Ovary (C560-C569)																									
F						<5 NR				<5 NR	9 11.4	<5 NR	10 15.9	18 39.7	7 19.9	7 25.1	8 35.6	15 66.1	**81**	**4.0**	3.1-5.0	623.5	0.5	208	6.2 (4.8-7.6)
Uterine adnexa & oth. fem gen. (C570-C579)																									
F													<5 NR	<5 NR	<5 NR		<5 NR	<5 NR	**6**	**0.3**	0.0-0.5	21.5	0.0	3010	0.4 (0.1-0.8)
Placenta (C580-C589)																									
F																			**0**					-	
Penis (C600-C609)																									
M																	<5 NR	<5 NR	**<5**	**0.1**	0 - 0.2	0.0	0.0	*	0.3 (0 - 0.7)
Prostate gland (C610-C619)																									
M										<5 NR	<5 NR	10 14.3	11 17.4	12 26.1	26 78.2	50 210.8	59 349.3	82 688.4	**253**	**11.1**	9.7-12.5	502.9	0.7	144	26.2 (23.0-29.5)
Testis (C620-C629)																									
M												<5 NR						<5 NR	**<5**	**0.1**	0 - 0.2	16.2	0.0	*	0.2 (0 - 0.5)

Appendix 3B. Cancer mortality, Western Australia, 2011

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
Other male genital (C630-C639)																									
M																			**0**					-	
Kidney (C640-C649)																									
M	<5							<5		<5	<5	<5	7	7	10	6	5	<5	**46**	**2.6**	1.8-3.4	384.9	0.3	301	4.2 (3.0-5.4)
	NR							NR		NR	NR	NR	11.1	15.2	30.1	25.3	29.6	NR							
F											<5	<5	<5	<5	<5	6	<5	<5	**23**	**1.0**	0.6-1.5	140.6	0.1	1053	1.8 (1.1-2.6)
											NR	NR	NR	NR	NR	21.5	NR	NR							
Bladder & urinary tract (C650-C689)																									
M									<5			<5	<5	10	11	19	15	21	**85**	**4.0**	3.1-4.9	251.5	0.3	296	8.6 (6.7-10.4)
									NR			NR	NR	21.8	33.1	80.1	88.8	176.3							
F									<5	<5		<5		6	<5	<5	5	10	**30**	**1.2**	0.7-1.7	126.5	0.1	704	2.3 (1.4-3.1)
									NR	NR		NR		13.2	NR	NR	22.3	44.1							
Eye & lacrimal gland (C690-C699)																									
M											<5					<5			**<5**	**0.1**	0 - 0.3	20.8	0.0	*	0.2 (0 - 0.5)
											NR					NR									
F													<5	<5			<5		**<5**	**0.2**	0 - 0.4	31.0	0.0	3710	0.3 (0.0-0.6)
													NR	NR			NR								
Meninges (cerebral & spinal) (C700-C709)																									
M																			**0**					-	
F																			**0**					-	
Brain (C710-C719)																									
M	<5		<5	<5		<5		<5	<5	<5	8	7	17	9	5	10	<5	6	**75**	**4.6**	3.5-5.6	978.2	0.5	212	6.5 (5.0-8.0)
	NR		NR	NR		NR		NR	NR	NR	10.1	10.0	26.9	19.6	15.0	42.2	NR	50.4							
F							<5	<5	<5	<5	<5	12	<5	6	<5	6	<5	<5	**52**	**2.8**	2.0-3.6	659.1	0.3	320	4.2 (3.0-5.3)
							NR	NR	NR	NR	NR	17.0	NR	13.2	NR	21.5	NR	NR							
Spinal cord & cranial nerves (C720-C729)																									
M																<5			**<5**	**0.0**	0 - 0.1	0.0	0.0	*	0.1 (0 - 0.3)
																NR									
F																			**0**					-	
Thyroid gland (C730-C739)																									
M														<5					**<5**	**0.1**	0 - 0.3	14.0	0.0	4593	0.2 (0 - 0.4)
														NR											
F															<5	<5		<5	**5**	**0.2**	0.0-0.3	2.4	0.0	7024	0.4 (0.0-0.7)
															NR	NR		NR							
Adrenal gland (C740-C749)																									
M		<5				<5		<5							<5				**6**	**0.5**	0.1-0.9	193.7	0.1	1887	0.5 (0.1-1.0)
		NR				NR		NR							NR										
F		<5						<5		<5						<5			**<5**	**0.3**	0 - 0.7	127.9	0.0	5263	0.4 (0.0-0.7)
		NR						NR		NR						NR									
Endocrine glands (not adrenal) (C750-C759)																									
M																			**0**					-	
F																			**0**					-	

Appendix 3B. Cancer mortality, Western Australia, 2011

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																									
Lymphoma, NOS / unclassifiable																									
M															<5			<5	**<5**	**0.1**	0 - 0.2	2.4	0.0	6653	0.2 (0 - 0.5)
															NR			NR							
F																	<5		**<5**	**0.0**	0 - 0.1	0.0	0.0	*	0.2 (0 - 0.4)
																	NR								
Hodgkin lymphoma																									
M		<5										<5			<5	<5	<5		**NR**	**0.3**	0 - 0.6	83.1	0.0	3457	0.5 (0.1-0.9)
		NR										NR			NR	NR	NR								
F						<5			<5				<5	<5					**6**	**0.4**	0.1-0.8	153.9	0.0	2267	0.5 (0.1-0.8)
						NR			NR				NR	NR											
All NHL																									
M										<5	<5	6	NR	7	5	9	9	10	**53**	**2.6**	1.9-3.3	262.2	0.2	407	5.0 (3.7-6.4)
										NR	NR	8.6	7.9	15.2	15.0	37.9	53.3	84.0							
F								<5		<5	<5	<5	<5	<5	9	5	15	22	**67**	**2.5**	1.9-3.2	308.0	0.3	400	5.0 (3.8-6.3)
								NR		NR	NR	NR	NR	NR	25.6	17.9	66.8	97.0							
NHL, mature B cell																									
M											<5	<5	<5	6	<5	7	7	6	**37**	**1.8**	1.2-2.4	178.6	0.2	618	3.5 (2.3-4.6)
											NR	NR	NR	13.1	NR	29.5	41.4	50.4							
F								<5		<5	<5	<5	<5	<5	<5	<5	13	17	**49**	**1.7**	1.2-2.3	217.0	0.1	734	3.6 (2.6-4.7)
								NR		NR	NR	NR	NR	NR	NR	NR	57.9	74.9							
NHL, mature T/NK cell																									
M										<5			<5	<5	<5	<5	<5	<5	**8**	**0.4**	0.1-0.7	48.7	0.1	1826	0.8 (0.2-1.3)
										NR			NR	NR	NR	NR	NR	NR							
F								<5				<5		<5	<5	<5	<5		**8**	**0.4**	0.1-0.7	67.0	0.1	1496	0.7 (0.2-1.2)
								NR				NR		NR	NR	NR	NR								
NHL, precursor cell lymphoblastic																									
M																			**0**					-	
F														<5					**<5**	**0.1**	0 - 0.2	7.2	0.0	9067	0.1 (0 - 0.2)
														NR											
NHL, other/unclassifiable																									
M												<5			<5	<5	<5	<5	**8**	**0.4**	0.1-0.6	34.7	0.0	3405	0.8 (0.2-1.4)
												NR			NR	NR	NR	NR							
F													<5		<5		<5	5	**9**	**0.3**	0.1-0.5	16.8	0.0	2745	0.6 (0.2-1.1)
													NR		NR		NR	22.0							
Lymphomas (all)																									
M		<5								<5	<5	7	NR	7	7	10	10	11	**60**	**3.0**	2.2-3.9	347.7	0.3	345	5.7 (4.3-7.2)
		NR								NR	NR	10.0	7.9	15.2	21.0	42.2	59.2	92.4							
F						<5		<5	<5	<5	<5	<5	5	<5	9	5	17	22	**75**	**3.0**	2.3-3.8	462.0	0.3	340	5.7 (4.4-7.0)
						NR		NR	NR	NR	NR	NR	8.0	NR	25.6	17.9	75.7	97.0							
MYELOMA																									
Myeloma/plasma cell tumours																									
M								<5	<5			5	<5	6	6	7	7	5	**41**	**2.1**	1.4-2.7	237.1	0.2	442	3.9 (2.7-5.1)
								NR	NR			7.2	NR	13.1	18.0	29.5	41.4	42.0							
F							<5				<5	<5	<5	6	<5	<5	7	8	**34**	**1.4**	0.9-1.9	169.8	0.2	661	2.6 (1.7-3.5)
							NR				NR	NR	NR	13.2	NR	NR	31.2	35.3							

Appendix 3B. Cancer mortality, Western Australia, 2011

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																									
Leukaemias, NOS/unclassifiable																									
M								<5							<5				**<5**	**0.2**	0 - 0.4	39.7	0.0	2785	0.3 (0 - 0.6)
								NR							NR										
F																	<5	<5	**<5**	**0.0**	0 - 0.1	0.0	0.0	*	0.1 (0 - 0.3)
																	NR	NR							
Leukaemias, lymphoid, all																									
M		<5			<5					<5	<5	<5	<5	<5	6	<5	11	6	**35**	**1.8**	1.1-2.4	235.0	0.2	588	3.4 (2.3-4.5)
		NR			NR					NR	NR	NR	NR	NR	18.0	NR	65.1	50.4							
F	<5								<5				<5	<5	<5	<5	<5	6	**16**	**0.7**	0.3-1.1	125.1	0.0	2193	1.2 (0.6-1.8)
	NR								NR				NR	NR	NR	NR	NR	26.4							
Leukaemias, lymphoid, acute																									
M		<5			<5					<5				<5	<5				**NR**	**0.4**	0.0-0.8	148.9	0.0	2272	0.4 (0.1-0.8)
		NR			NR					NR				NR	NR										
F	<5												<5		<5				**<5**	**0.3**	0 - 0.6	86.9	0.0	3479	0.2 (0 - 0.5)
	NR												NR		NR										
Leukaemias, lymphoid, chronic																									
M											<5	<5	<5	<5	<5	<5	10	6	**28**	**1.3**	0.8-1.7	83.7	0.1	900	2.8 (1.7-3.8)
											NR	NR	NR	NR	NR	NR	59.2	50.4							
F									<5					<5		<5	<5	6	**13**	**0.4**	0.2-0.7	38.2	0.0	5929	0.9 (0.4-1.5)
									NR					NR		NR	NR	26.4							
Leukaemias, lymphoid, other/NOS																									
M															<5		<5		<5	**0.1**	0 - 0.2	2.4	0.0	6653	0.2 (0 - 0.5)
															NR		NR								
F																			**0**					-	
Leukaemias, myeloid, all																									
M	<5					<5	<5	<5	<5	<5		<5	<5	5	<5	6	6	10	**45**	**2.4**	1.7-3.2	430.5	0.2	482	4.3 (3.0-5.5)
	NR					NR	NR	NR	NR	NR		NR	NR	10.9	NR	25.3	35.5	84.0							
F									<5	<5	<5	<5	6	<5	6	9	11	8	**48**	**2.0**	1.4-2.6	219.5	0.2	504	3.8 (2.7-4.9)
									NR	NR	NR	NR	9.6	NR	17.1	32.2	49.0	35.3							
Leukaemias, myeloid, acute																									
M	<5					<5	<5	<5	<5			<5	<5	<5	<5	6	<5	<5	**33**	**1.8**	1.2-2.5	350.9	0.2	586	3.1 (2.0-4.1)
	NR					NR	NR	NR	NR			NR	NR	NR	NR	25.3	NR	NR							
F									<5	<5	<5	<5	6	<5	5	7	7	5	**38**	**1.7**	1.1-2.3	217.1	0.2	543	3.0 (2.0-4.0)
									NR	NR	NR	NR	9.6	NR	14.2	25.1	31.2	22.0							
Leukaemias, myeloid, chronic																									
M						<5				<5					<5			<5	**5**	**0.3**	0.0-0.6	72.5	0.0	3827	0.5 (0.1-0.9)
						NR				NR					NR			NR							
F																<5	<5	<5	**<5**	**0.1**	0 - 0.2	0.0	0.0	*	0.3 (0.0-0.6)
																NR	NR	NR							
Leukaemias, myeloid, other/NOS																									
M														<5			<5	<5	**7**	**0.3**	0.1-0.5	7.0	0.0	9186	0.7 (0.2-1.3)
														NR			NR	NR							
F															<5	<5	<5	<5	**6**	**0.2**	0.0-0.3	2.4	0.0	7024	0.5 (0.1-0.9)
															NR	NR	NR	NR							

Appendix 3B. Cancer mortality, Western Australia, 2011

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, other																									
M																			**0**					-	
F																			**0**					-	
Leukaemias (all)																									
M	<5	<5			<5	<5	<5	<5	<5	<5	<5	<5	6	8	12	8	17	16	**83**	**4.4**	3.4-5.4	705.5	0.4	242	8.0 (6.2-9.7)
	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	9.5	17.4	36.1	33.7	100.6	134.3							
F	<5								<5	<5	<5	<5	7	<5	7	11	15	15	**66**	**2.7**	2.0-3.5	344.7	0.2	410	5.1 (3.9-6.4)
	NR								NR	NR	NR	NR	11.2	NR	19.9	39.4	66.8	66.1							
MYELODYSPLASTIC DISEASES																									
Refractory anaemias/cytopaenias																									
M					<5										<5	<5	<5	<5	**8**	**0.4**	0.1-0.6	52.0	0.0	4882	0.8 (0.2-1.4)
					NR										NR	NR	NR	NR							
F								<5						<5	<5	<5	<5	<5	**11**	**0.4**	0.2-0.7	52.6	0.0	2365	0.9 (0.4-1.4)
								NR						NR	NR	NR	NR	NR							
Myelodysplastic syndromes																									
M										<5			<5	<5	<5	<5	<5	8	**23**	**1.1**	0.6-1.5	60.5	0.1	1045	2.4 (1.4-3.3)
										NR			NR	NR	NR	NR	NR	67.2							
F												<5	<5	<5		<5	<5	8	**17**	**0.5**	0.2-0.8	35.8	0.0	3832	1.2 (0.6-1.8)
												NR	NR	NR		NR	NR	35.3							
Myelodysplastic diseases, all																									
M					<5					<5			<5	<5	5	5	7	9	**31**	**1.4**	0.9-2.0	112.6	0.1	861	3.2 (2.0-4.3)
					NR					NR			NR	NR	15.0	21.1	41.4	75.6							
F								<5				<5	<5	<5	<5	<5	7	10	**28**	**1.0**	0.6-1.4	88.4	0.1	1463	2.1 (1.3-2.9)
								NR				NR	NR	NR	NR	NR	31.2	44.1							
CHRONIC MYELOPROLIFERATIVE DISEASES																									
Chronic myeloproliferative disorder, NOS																									
M																		<5	**<5**	**0.0**	0 - 0.1	0.0	0.0	*	0.1 (0 - 0.3)
																		NR							
F																			**0**					-	
Polycythaemia rubra vera																									
M													<5				<5	<5	**<5**	**0.1**	0 - 0.3	11.6	0.0	*	0.3 (0 - 0.6)
													NR				NR	NR							
F																		<5	**<5**	**0.0**	0 - 0.1	0.0	0.0	*	0.1 (0 - 0.3)
																		NR							
Myelofibrosis/sclerosis																									
M																	<5	<5	**<5**	**0.1**	0 - 0.2	0.0	0.0	*	0.2 (0 - 0.5)
																	NR	NR							
F																		<5	**<5**	**0.0**	0 - 0.1	0.0	0.0	*	0.1 (0 - 0.3)
																		NR							
Other chronic myeloproliferative d/o																									
M													<5						**<5**	**0.1**	0 - 0.2	11.6	0.0	*	0.1 (0 - 0.2)
													NR												
F												<5					<5		**<5**	**0.1**	0 - 0.2	16.7	0.0	*	0.1 (0 - 0.4)
												NR					NR								

Appendix 3B. Cancer mortality, Western Australia, 2011

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
Chronic myeloproliferative d/o, all																									
M													<5				<5	<5	**7**	**0.3**	0.1-0.6	23.2	0.0	6323	0.7 (0.2-1.2)
													NR				NR	NR							
F												<5					<5	<5	**6**	**0.2**	0.0-0.3	16.7	0.0	*	0.4 (0.1-0.7)
												NR					NR	NR							
OTHER CHRONIC IMMUNOPROLIFERATIVE DISEASES																									
Mast cell tumours																									
M														<5					**<5**	**0.1**	0 - 0.2	7.0	0.0	9186	0.1 (0 - 0.2)
														NR											
F																			**0**					-	
Histiocytic/dendritic cell malignancies																									
M																			**0**					-	
F												<5							**<5**	**0.1**	0 - 0.2	16.7	0.0	*	0.1 (0 - 0.2)
												NR													
Other & U/S immunoproliferative neoplasms																									
M																	<5	<5	**<5**	**0.1**	0 - 0.2	0.0	0.0	*	0.2 (0 - 0.5)
																	NR	NR							
F																<5	<5		**<5**	**0.1**	0 - 0.1	0.0	0.0	*	0.2 (0 - 0.4)
																NR	NR								
Other chronic immunoproliferative d/o, all																									
M														<5			<5	<5	**<5**	**0.1**	0 - 0.3	7.0	0.0	9186	0.3 (0 - 0.6)
														NR			NR	NR							
F												<5				<5	<5		**<5**	**0.1**	0 - 0.3	16.7	0.0	*	0.2 (0 - 0.5)
												NR				NR	NR								
Unknown primary site (C80 or Behaviour 6/9)																									
M		<5					<5			<5	<5	8	10	10	14	16	17	23	**105**	**5.3**	4.2-6.3	566.6	0.5	201	10.2 (8.2-12.1)
		NR					NR			NR	NR	11.5	15.8	21.8	42.1	67.4	100.6	193.1							
F										<5	<5	5	6	<5	7	11	20	36	**95**	**3.4**	2.6-4.1	338.6	0.3	379	7.0 (5.6-8.4)
										NR	NR	7.1	9.6	NR	19.9	39.4	89.1	158.7							
Total deaths due to cancer																									
M	<5	5	<5	<5	<5	7	6	14	18	55	98	149	220	254	293	380	356	369	**2232**	**113.7**	109-119	13628.9	11.3	9	213.1 (204-222)
	NR	6.7	NR	NR	NR	7.3	7.1	16.4	20.6	65.2	123.8	213.7	348	553	881	1602	2107	3098							
F	<5	<5			<5	<5	6	20	30	54	86	127	143	173	171	186	253	374	**1630**	**72.2**	68.3-76.0	11226.4	7.6	14	125.5 (119-132)
	NR	NR			NR	NR	7.4	24.0	35.0	65.1	109.1	180.4	227.8	382	487	667	1127	1648							

Appendix 3B. Cancer mortality, Western Australia, 2011

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
Other non-"cancer" mortality data, 2011																									
Deaths due to benign tumours in CR cases																									
M	<5												<5		<5	<5		<5	**6**	**0.4**	0.0-0.8	85	0.0	3425	0.6 (0.1-1.1)
	NR												NR		NR	NR		NR							
F								<5									<5		**<5**	**0.1**	0 - 0.2	36	0.0	*	0.2 (0 - 0.4)
								NR									NR								
Deaths due to lymphohaematopoietic tumours of uncertain malignant potential																									
M																<5			**<5**	**0.1**	0 - 0.2	0	0.0	*	0.2 (0 - 0.5)
																NR									
F																			**0**					-	
Deaths due to non-lymphohaematopoietic tumours of uncertain/unspecified nature																									
M						<5									<5	<5			**<5**	**0.2**	0 - 0.5	50	0.0	2838	0.4 (0.0-0.8)
						NR									NR	NR									
F								<5						<5			<5		**<5**	**0.2**	0 - 0.4	43	0.0	5873	0.2 (0 - 0.5)
								NR						NR			NR								
Non-cancer deaths in CR cases																									
M					<5		<5	<5	<5	6	8	20	32	57	103	140	245	430	**1048**	**45.7**	42.9-48.6	1919	2.7	38	109.7 (103-116)
					NR		NR	NR	NR	7.1	10.1	28.7	50.6	124.1	309.7	590.1	1450.3	3610.1							
F					<5	<5		5	<5	6	12	12	19	28	50	63	135	453	**787**	**23.7**	21.9-25.6	1505	1.4	71	54.9 (51.0-58.8)
					NR	NR		6.0	NR	7.2	15.2	17.0	30.3	61.8	142.4	225.7	601.2	1996.6							
Deaths of undetermined cause in CR cases																									
M									<5		<5		<5	<5	<5	6	<5	<5	**20**	**0.9**	0.5-1.4	90	0.1	1547	2.0 (1.1-2.9)
									NR		NR		NR	NR	NR	25.3	NR	NR							
F										<5				<5			<5	<5	**5**	**0.2**	0 - 0.4	33	0.0	5862	0.4 (0.0-0.7)
										NR				NR			NR	NR							
Total deaths of Cancer Registry cases																									
M	<5	5	<5	<5	<5	8	7	16	21	61	106	169	253	311	399	526	602	800	**3294**	**160.2**	155-166	15825	14.0	8	324.3 (313-335)
	NR	6.7	NR	NR	NR	8.3	8.3	18.7	24.0	72.3	133.9	242.4	400.2	677.1	1199.5	2217.2	3563.6	6716.5							
F	<5	<5			<5	5	6	27	32	60	98	139	162	203	221	249	392	827	**2425**	**96.2**	92.0-101	12889	9.1	12	181.0 (174-188)
	NR	NR			NR	5.7	7.4	32.4	37.4	72.4	124.3	197.5	258.1	447.8	629.3	892.2	1745.6	3644.9							

Appendix 3C. Childhood cancer, Western Australia, 2011 (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	<5 NR	7 11.1	<5 NR	<5 NR	**14**	**6.4**	3.0-9.8	100		7 11.5	<5 NR	<5 NR	**10**	**4.9**	1.8-7.9	100	<5 NR	14 11.3	6 4.1	<5 NR	**24**	**5.6**	3.4-7.9	100
Lymphoid leukaemia		NR 7.9	<5 NR		**9**	**4.2**	1.4-6.9	100		7 11.5	<5 NR	<5 NR	**10**	**4.9**	1.8-7.9	100		12 9.7	NR 4.1	<5 NR	**19**	**4.5**	2.5-6.6	100
Acute myeloid leukaemia	<5 NR	<5 NR		<5 NR	**5**	**2.2**	0.3-4.2	100					**0**				<5 NR	<5 NR		<5 NR	**5**	**1.1**	0.1-2.1	100
Chronic MPDs					**0**								**0**								**0**			
MDS & other MPDs					**0**								**0**								**0**			
Unspecified/other leukaemia					**0**								**0**								**0**			
II. LYMPHOMAS																								
All		<5 NR	<5 NR	<5 NR	**7**	**3.0**	0.8-5.2	100			<5 NR	<5 NR	**5**	**2.1**	0.3-3.9	100		<5 NR	6 4.1	NR 3.4	**12**	**2.6**	1.1-4.0	100
Hodgkin lymphoma			<5 NR		**<5**	**0.9**	0 - 2.1	100			<5 NR	<5 NR	**<5**	**0.8**	0 - 2.0	100			<5 NR	<5 NR	**<5**	**0.9**	0.0-1.7	100
Non-Hodgkin lymphoma exc Burkit		<5 NR	<5 NR	<5 NR	**<5**	**1.7**	0.0-3.5	100			<5 NR	<5 NR	**<5**	**1.2**	0 - 2.7	100		<5 NR	<5 NR	<5 NR	**7**	**1.5**	0.4-2.6	100
Burkitt lymphoma				<5 NR	**<5**	**0.4**	0 - 1.1	100					**0**							<5 NR	**<5**	**0.2**	0 - 0.6	100
Misc. lymphoreticular neoplasms					**0**								**0**								**0**			
Unspecified lymphoma					**0**								**0**								**0**			
III. CNS AND INTRACRANIAL/SPINAL																								
All		<5 NR	<5 NR	<5 NR	**10**	**4.5**	1.7-7.3	90	<5 NR	<5 NR	<5 NR		**5**	**2.4**	0.3-4.5	80	<5 NR	7 5.6	5 3.4	<5 NR	**15**	**3.5**	1.7-5.3	87
Ependymoma/choroid plexus		<5 NR			**<5**	**0.5**	0 - 1.4	100					**0**					<5 NR			**<5**	**0.2**	0 - 0.7	100
Astrocytoma		<5 NR	<5 NR	<5 NR	**7**	**3.0**	0.8-5.3	100		<5 NR	<5 NR		**<5**	**1.0**	0 - 2.3	100		<5 NR	<5 NR	<5 NR	**9**	**2.0**	0.7-3.4	100
Embryonal tumours					**0**						<5 1.4		**<5**	**0.4**	0 - 1.3	100			<5 0.7		**<5**	**0.2**	0 - 0.7	100
Other gliomas		<5 NR			**<5**	**1.0**	0 - 2.3	50		<5 NR			**<5**	**0.5**	0 - 1.5	0		<5 NR			**<5**	**0.7**	0 - 1.6	33
Other intracranial/spinal					**0**				<5 NR				**<5**	**0.5**	0 - 1.4	100	<5 NR				**<5**	**0.2**	0 - 0.7	100
Unspecified					**0**								**0**								**0**			

Appendix 3C. Childhood cancer, Western Australia, 2011 (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	<5 NR	<5 NR			**<5**	**1.0**	0 - 2.3	100		<5 NR	<5 NR		**<5**	**1.0**	0 - 2.3	100	<5 NR	<5 NR	<5 NR		**<5**	**1.0**	0.0-1.9	100
Neuroblastoma/ganglioneurobl.	<5 NR	<5 NR			**<5**	**1.0**	0 - 2.3	100		<5 NR	<5 NR		**<5**	**1.0**	0 - 2.3	100	<5 NR	<5 NR	<5 NR		**<5**	**1.0**	0.0-1.9	100
Other					**0**								**0**								**0**			
V. RETINOBLASTOMA																								
All					**0**				<5 NR	<5 NR			**5**	**2.5**	0.3-4.8	100	<5 NR	<5 NR			**5**	**1.2**	0.2-2.3	100
VI. RENAL TUMOURS																								
All	<5 NR	<5 NR	<5 NR		**<5**	**1.4**	0 - 3.0	100	<5 NR	<5 NR	<5 NR		**6**	**2.9**	0.6-5.3	100	<5 NR	<5 NR	<5 NR		**9**	**2.1**	0.7-3.5	100
Nephroblastoma/oth non-epithel.	<5 NR	<5 NR	<5 NR		**<5**	**1.4**	0 - 3.0	100	<5 NR	<5 NR	<5 NR		**6**	**2.9**	0.6-5.3	100	<5 NR	<5 NR	<5 NR		**9**	**2.1**	0.7-3.5	100
Renal carcinoma					**0**								**0**								**0**			
Unspecified					**0**								**0**								**0**			
VII. HEPATIC TUMOURS																								
All					**0**				<5 NR				**<5**	**0.5**	0 - 1.4	100	<5 NR				**<5**	**0.2**	0 - 0.7	100
Hepatoblastoma					**0**				<5 NR				**<5**	**0.5**	0 - 1.4	100	<5 NR				**<5**	**0.2**	0 - 0.7	100
Hepatic carcinoma					**0**								**0**								**0**			
Unspecified					**0**								**0**								**0**			
VIII. BONE																								
All		<5 NR		<5 NR	**5**	**2.0**	0.2-3.8	100			<5 NR		**<5**	**0.4**	0 - 1.3	100		<5 NR	<5 NR	<5 NR	**6**	**1.3**	0.2-2.3	100
Osteosarcoma		<5 NR		<5 NR	**5**	**2.0**	0.2-3.8	100					**0**					<5 NR		<5 NR	**5**	**1.0**	0.1-1.9	100
Chondrosarcoma					**0**								**0**								**0**			
Ewing & related sarcoma					**0**						<5 NR		**<5**	**0.4**	0 - 1.3	100			<5 NR		**<5**	**0.2**	0 - 0.7	100
Other specified					**0**								**0**								**0**			
Unspecified					**0**								**0**								**0**			

Appendix 3C. Childhood cancer, Western Australia, 2011 (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	<5 NR		<5 NR	<5 NR	**<5**	**1.7**	0.0-3.4	100	<5 NR			<5 NR	**<5**	**1.4**	0 - 2.9	100	<5 NR		<5 NR	<5 NR	**7**	**1.5**	0.4-2.7	100
Rhabdomyosarcoma	<5 NR			<5 NR	**<5**	**0.8**	0 - 2.0	100					**0**				<5 NR			<5 NR	**<5**	**0.4**	0 - 1.0	100
Fibrosarcoma/Neurofibrosarc.					**0**								**0**								**0**			
Kaposi sarcoma					**0**								**0**								**0**			
Other specified			<5 NR		**<5**	**0.4**	0 - 1.3	100	<5 NR			<5 NR	**<5**	**1.4**	0 - 2.9	100	<5 NR		<5 NR	<5 NR	**<5**	**0.9**	0.0-1.8	100
Unspecified			<5 NR		**<5**	**0.4**	0 - 1.3	100					**0**						<5 NR		**<5**	**0.2**	0 - 0.7	100
X. GONADAL AND GERM CELL																								
All		<5 NR			**<5**	**0.5**	0 - 1.4	100				<5 NR	**<5**	**0.4**	0 - 1.2	100		<5 NR		<5 NR	**<5**	**0.4**	0 - 1.1	100
Intracranial/spinal					**0**								**0**								**0**			
Other/unspecified non-gonadal		<5 NR			**<5**	**0.5**	0 - 1.4	100					**0**					<5 NR			**<5**	**0.2**	0 - 0.7	100
Gonadal germ cell					**0**							<5 NR	**<5**	**0.4**	0 - 1.2	100				<5 NR	**<5**	**0.2**	0 - 0.6	100
Gonadal carcinoma					**0**								**0**								**0**			
Other and unspecified					**0**								**0**								**0**			
XI. OTHER EPITHELIAL / MELANOMA																								
All		<5 NR		<5 NR	**<5**	**1.3**	0 - 2.7	100				<5 NR	**<5**	**0.4**	0 - 1.2	100		<5 NR		<5 NR	**<5**	**0.8**	0.0-1.7	100
Adrenocortical carcinoma					**0**								**0**								**0**			
Thyroid carcinoma				<5 NR	**<5**	**0.4**	0 - 1.1	100					**0**							<5 NR	**<5**	**0.2**	0 - 0.6	100
Nasopharyngeal carcinoma					**0**								**0**								**0**			
Malignant melanoma		<5 NR			**<5**	**0.5**	0 - 1.4	100					**0**					<5 NR			**<5**	**0.2**	0 - 0.7	100
Skin carcinomas					**0**								**0**								**0**			
Other/unspecified carcinoma				<5 NR	**<5**	**0.4**	0 - 1.1	100				<5 NR	**<5**	**0.4**	0 - 1.2	100				<5 NR	**<5**	**0.4**	0 - 0.9	100

Appendix 3C. Childhood cancer, Western Australia, 2011 (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																								
	<5	18	14	NR	**49**	**21.7**	15.6-27.8	98	6	17	10	7	**40**	**18.9**	13.0-24.8	98	10	35	24	20	**89**	**20.3**	16.1-24.6	98
	NR	28.4	18.8	17.2					37.9	28.0	13.9	9.6					30.9	28.2	16.4	13.5				

Appendix 3D. Cancer incidence, Western Australia, 2011: Leading types by sex and geographic area

CHS Kimberley Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**15**	20.3	**82.4**	40.0-125	10	106.9 (45.2-169)
Melanoma (skin)	**12**	16.2	**60.7**	25.1-96.4	16	84.1 (27.4-141)
Colorectal	**9**	12.2	**46.0**	14.1-77.9	17	72.8 (15.4-130)
Colon	**4**	5.4	**24.1**	0 - 49.2	33	45.3 (0 - 97.2)
Rectum	**5**	6.8	**21.9**	2.2-41.7	36	27.5 (3.0-52.1)
Lung	**8**	10.8	**44.8**	13.0-76.6	23	76.2 (13.8-139)
Lip, gum & mouth	**<5**	NR	**NR**	0 - 42.6	35	25.2 (0 - 50.5)
Liver	**<5**	NR	**NR**	0 - 41.3	28	26.9 (0 - 59.6)
Tongue	**<5**	NR	**NR**	0 - 25.6	67	13.1 (0 - 31.4)
Pharynx	**<5**	NR	**NR**	0 - 25.2	64	12.6 (0 - 30.5)
Pancreas	**<5**	NR	**NR**	0 - 29.7	248	27 (0 - 70.4)
Testis	**<5**	NR	**NR**	0 - 18.2	182	8.3 (0 - 19.8)
Bladder & urinary tract	**<5**	NR	**NR**	0 - 23.4	268	23.3 (0 - 60.1)
Unknown primary	**<5**	NR	**NR**	0 - 26.6	69	12.9 (0 - 31.1)
All cancers	**74**	100.0	**391.6**	300-483	3	571.2 (420-723)

Females

	Cases	%	ASR
Breast	**16**	30.2	**85.7**
Melanoma (skin)	**6**	11.3	**33.1**
Lung	**<5**	NR	**NR**
Colorectal	**<5**	NR	**NR**
Colon	**<5**	NR	**NR**
Rectum	**<5**	NR	**NR**
Gallbladder / bile ducts	**<5**	NR	**NR**
Unknown primary	**<5**	NR	**NR**
Liver	**<5**	NR	**NR**
Vulva	**<5**	NR	**NR**
Uterus	**<5**	NR	**NR**
Bladder & urinary tract	**<5**	NR	**NR**
Thyroid gland	**<5**	NR	**NR**
All cancers	**53**	100.0	**295.8**

CHS Pilbara Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**14**	23.3	**56.3**	17.1-95.6	18	100.2 (0 - 202)
Lung	**8**	13.3	**69.1**	13.9-124	12	153.1 (13.1-293)
Colorectal	**6**	10.0	**22.7**	0 - 46.1	25	31 (0 - 67.0)
Colon	**<5**	NR	**NR**	0 - 12.5	178	5.6 (0 - 13.6)
Rectum	**<5**	NR	**NR**	0 - 39.7	30	25.4 (0 - 60.5)
Melanoma (skin)	**5**	8.3	**10.1**	0.8-19.4	106	11.2 (0.9-21.4)
Lymphoma	**5**	8.3	**18.9**	0 - 44.3	174	42.1 (0 - 109)
Lymphoma NOS	**<5**	NR	**NR**			
Hodgkin lymphoma	**<5**	NR	**NR**			
NHL	**5**	8.3	**18.9**	0 - 44.3	174	42.1 (0 - 109)
Mesothelioma	**<5**	NR	**NR**	0 - 57.2	64	61.7 (0 - 160)
Oesophagus	**<5**	NR	**NR**	0 - 12.3	172	5.7 (0 - 13.9)
Pancreas	**<5**	NR	**NR**	0 - 44.9	603	52.2 (0 - 149)
Larynx	**<5**	NR	**NR**	0 - 35.4	33	20.8 (0 - 55.4)
Testis	**<5**	NR	**NR**	0 - 8.2	397	3.6 (0 - 8.6)
All cancers	**60**	100.0	**283.0**	187-379	4	568.9 (322-816)

Females

	Cases	%	ASR
Breast	**16**	31.4	**87.6**
Melanoma (skin)	**6**	11.8	**36.1**
Colorectal	**5**	9.8	**25.2**
Colon	**<5**	NR	**NR**
Rectum	**<5**	NR	**NR**
Lung	**5**	9.8	**34.2**
Thyroid gland	**5**	9.8	**13.2**
Lymphoma	**<5**	NR	**NR**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**<5**	NR	**NR**
Cervix	**<5**	NR	**NR**
All cancers	**51**	100.0	**256.6**

CHS Midwest Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**71**	38.0	**128.5**	98.2-159	6	193.9 (148-240)
Colorectal	**24**	12.8	**44.0**	26.1-61.9	19	66.5 (39.1-93.9)
Colon	**14**	7.5	**25.8**	12.2-39.5	30	41.3 (18.8-63.7)
Rectum	**10**	5.3	**18.1**	6.5-29.7	49	25.3 (9.4-41.1)
Lung	**22**	11.8	**38.0**	21.8-54.1	25	65.5 (37.3-93.7)
Leukaemia	**13**	7.0	**25.0**	10.4-39.5	74	44.7 (19.7-69.6)
Leukaemia NOS	**<5**	NR	**NR**			
Lymphoid leukaemia	**8**	4.3	**13.0**	3.5-22.4	135	26.8 (7.7-45.9)
Myeloid leukaemia	**5**	2.7	**12.0**	0.9-23.1	162	17.9 (1.7-34.0)
Leukaemia, other	**<5**	NR	**NR**			
Melanoma (skin)	**12**	6.4	**25.4**	10.6-40.1	32	33.8 (14.5-53.2)
Kidney	**6**	3.2	**15.9**	2.0-29.8	70	15.6 (3.0-28.2)
Oesophagus	**<5**	NR	**NR**	0 - 11.4	442	14 (0 - 28.3)
Stomach	**<5**	NR	**NR**	0.0-13.4	295	15 (0 - 30.1)
All cancers	**187**	100.0	**345.1**	294-396	3	537.5 (459-616)

Females

	Cases	%	ASR
Breast	**40**	26.7	**83.8**
Colorectal	**22**	14.7	**39.2**
Colon	**12**	8.0	**21.9**
Rectum	**9**	6.0	**15.1**
Lung	**21**	14.0	**37.9**
Melanoma (skin)	**17**	11.3	**32.4**
Uterus	**8**	5.3	**17.0**
Ovary	**5**	3.3	**9.1**
Unknown primary	**5**	3.3	**8.5**
All cancers	**150**	100.0	**300.6**

Appendix 3D. Cancer incidence, Western Australia, 2011: Leading types by sex and geographic area

CHS Wheatbelt Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**97**	32.9	**126.7**	101-152	7	193.3 (154-233)
Melanoma (skin)	**31**	10.5	**47.2**	29.6-64.8	20	71 (45.4-96.7)
Colorectal	**30**	10.2	**43.8**	26.3-61.2	22	64.5 (40.7-88.3)
Colon	**20**	6.8	**28.6**	14.8-42.3	33	43 (23.6-62.4)
Rectum	**10**	3.4	**15.2**	4.5-25.9	65	21.5 (7.7-35.4)
Lung	**29**	9.8	**39.2**	24.3-54.2	20	61.3 (38.3-84.2)
Leukaemia	**14**	4.7	**20.0**	7.1-32.9	95	36.2 (17.2-55.3)
Leukaemia NOS	**<5**	NR	**NR**	0 - 3.8	314	2.1 (0 - 6.2)
Lymphoid leukaemia	**5**	1.7	**3.7**	0.5-7.0	*	12.6 (1.6-23.7)
Myeloid leukaemia	**8**	2.7	**15.0**	2.7-27.2	136	21.5 (6.5-36.5)
Leukaemia, other	**<5**	NR	**NR**			
Kidney	**13**	4.4	**16.7**	7.3-26.1	59	26.6 (11.9-41.4)
Lymphoma	**12**	4.1	**18.5**	6.5-30.5	49	25.8 (10.7-40.9)
Lymphoma NOS	**<5**	NR	**NR**	0 - 4.1	572	1.5 (0 - 4.4)
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 12.6	378	3.6 (0 - 10.5)
NHL	**10**	3.4	**12.8**	4.6-21.1	62	20.7 (7.7-33.8)
Lip, gum & mouth	**11**	3.7	**18.1**	7.0-29.3	44	23.4 (9.0-37.7)
All cancers	**295**	100.0	**405.4**	356-455	3	632.3 (559-706)

Females

	Cases	%	ASR
Breast	**53**	30.5	**89.2**
Melanoma (skin)	**19**	10.9	**30.8**
Colorectal	**16**	9.2	**17.3**
Colon	**NR**	6.3	**10.6**
Rectum	**<5**	NR	**NR**
Lung	**13**	7.5	**16.7**
Uterus	**12**	6.9	**16.9**
Leukaemia	**7**	4.0	**11.9**
Leukaemia NOS	**0**		
Lymphoid leukaemia	**<5**	NR	**NR**
Myeloid leukaemia	**<5**	NR	**NR**
Leukaemia, other	**0**		
Ovary	**6**	3.4	**8.6**
Thyroid gland	**6**	3.4	**13.3**
All cancers	**174**	100.0	**262.0**

CHS Goldfields Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**29**	23.8	**85.7**	54.1-117	9	117.4 (71.9-163)
Colorectal	**22**	18.0	**66.8**	38.7-94.9	12	109.3 (60.0-159)
Colon	**9**	7.4	**26.9**	9.1-44.7	34	47.6 (14.1-81.1)
Rectum	**13**	10.7	**39.9**	18.0-61.7	18	61.7 (25.5-97.9)
Lung	**12**	9.8	**35.1**	14.9-55.3	23	57.1 (20.7-93.6)
Melanoma (skin)	**7**	5.7	**18.6**	4.7-32.4	60	26.4 (5.1-47.7)
Stomach	**6**	4.9	**18.9**	3.7-34.1	31	24.7 (4.3-45.1)
Kidney	**6**	4.9	**16.7**	3.3-30.2	67	24.8 (2.6-47.0)
Lip, gum & mouth	**5**	4.1	**14.3**	1.6-27.0	74	21 (0.9-41.1)
Leukaemia	**5**	4.1	**13.2**	1.5-24.9	53	18.3 (1.7-34.9)
Leukaemia NOS	**0**					
Lymphoid leukaemia	**<5**	NR	**NR**	0 - 11.6	183	6.4 (0 - 15.3)
Myeloid leukaemia	**<5**	NR	**NR**	0 - 17.9	74	11.9 (0 - 25.9)
Leukaemia, other	**0**					
Oesophagus	**<5**	NR	**NR**	0.0-26.1	69	23.6 (0 - 50.4)
Lymphoma	**<5**	NR	**NR**	0 - 26.6	124	16.8 (0 - 35.2)
All cancers	**122**	100.0	**365.1**	300-430	3	538.8 (434-643)

Females

	Cases	%	ASR
Breast	**22**	25.9	**68.8**
Lung	**8**	9.4	**25.6**
Colorectal	**7**	8.2	**21.7**
Colon	**<5**	NR	**NR**
Rectum	**<5**	NR	**NR**
Melanoma (skin)	**7**	8.2	**20.5**
Kidney	**6**	7.1	**19.7**
Uterus	**5**	5.9	**16.8**
Cervix	**<5**	NR	**NR**
Thyroid gland	**<5**	NR	**NR**
Liver	**<5**	NR	**NR**
All cancers	**85**	100.0	**265.3**

CHS Great Southern Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**61**	30.5	**108.1**	80.0-136	8	166.1 (124-208)
Lung	**23**	11.5	**37.3**	21.4-53.2	26	66.6 (39.0-94.2)
Colorectal	**22**	11.0	**37.5**	21.3-53.8	23	62.3 (36.2-88.5)
Colon	**11**	5.5	**19.1**	7.4-30.7	41	30.6 (12.4-48.8)
Rectum	**11**	5.5	**18.5**	7.1-29.8	49	31.7 (12.9-50.5)
Melanoma (skin)	**22**	11.0	**39.8**	20.3-59.2	29	66.7 (38.1-95.3)
Lymphoma	**12**	6.0	**27.0**	9.1-44.9	34	36.1 (15.2-56.9)
Lymphoma NOS	**<5**	NR	**NR**			
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 5.1	233	2.8 (0 - 8.4)
NHL	**11**	5.5	**25.3**	7.7-42.8	40	33.2 (13.1-53.3)
Pancreas	**5**	2.5	**7.5**	0.5-14.4	91	13.4 (1.6-25.2)
Unknown primary	**5**	2.5	**7.3**	0.6-14.1	153	15.4 (1.9-29.0)
Leukaemia	**5**	2.5	**11.0**	1.1-21.0	95	14.7 (1.6-27.7)
All cancers	**200**	100.0	**361.6**	308-416	3	571.3 (492-651)

Females

	Cases	%	ASR
Breast	**43**	30.5	**83.2**
Colorectal	**22**	15.6	**26.4**
Colon	**NR**	12.8	**22.0**
Rectum	**<5**	NR	**NR**
Melanoma (skin)	**14**	9.9	**31.8**
Lung	**9**	6.4	**14.1**
Brain	**6**	4.3	**15.6**
Ovary	**5**	3.5	**6.9**
Thyroid gland	**<5**	NR	**NR**
Lymphoma	**<5**	NR	**NR**
Lymphoma NOS	**0**		
Hodgkin lymphoma	**0**		
NHL	**<5**	NR	**NR**
All cancers	**141**	100.0	**251.4**

Appendix 3D. Cancer incidence, Western Australia, 2011: Leading types by sex and geographic area

CHS South West Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**123**	27.0	**93.6**	76.9-110	8	137.2 (113-162)
Melanoma (skin)	**77**	16.9	**61.6**	47.1-76.2	16	93.6 (72.3-115)
Colorectal	**58**	12.7	**45.3**	33.3-57.2	21	67.3 (49.7-85.0)
Colon	**34**	7.5	**26.3**	17.2-35.4	37	38.9 (25.5-52.2)
Rectum	**24**	5.3	**19.0**	11.2-26.7	45	28.4 (16.9-40.0)
Lung	**36**	7.9	**24.7**	16.4-32.9	37	45.2 (30.2-60.2)
Lymphoma	**19**	4.2	**14.3**	7.6-21.1	59	22.3 (12.1-32.6)
Lymphoma NOS	**<5**	NR	**NR**	0 - 1.7	*	1.5 (0 - 4.5)
Hodgkin lymphoma	**<5**	NR	**NR**			
NHL	**18**	3.9	**13.8**	7.1-20.5	59	20.8 (11.0-30.6)
Kidney	**15**	3.3	**11.8**	5.6-17.9	70	17.9 (8.7-27.0)
Lip, gum & mouth	**11**	2.4	**8.8**	3.5-14.2	101	13.3 (5.2-21.3)
Oesophagus	**10**	2.2	**7.2**	2.6-11.8	150	12.7 (4.7-20.7)
Bladder & urinary tract	**10**	2.2	**6.9**	2.6-11.3	111	12.5 (4.6-20.4)
Brain	**10**	2.2	**9.5**	3.2-15.8	132	13.7 (5.1-22.4)
Stomach	**9**	2.0	**7.1**	2.4-11.9	138	10.5 (3.5-17.5)
Unknown primary	**9**	2.0	**5.0**	1.6-8.4	426	12.2 (4.1-20.4)
Leukaemia	**9**	2.0	**6.3**	2.1-10.5	157	11.2 (3.7-18.7)
Leukaemia NOS	**<5**	NR	**NR**	0 - 2.3	510	1.3 (0 - 3.8)
Lymphoid leukaemia	**6**	1.3	**4.2**	0.8-7.6	289	7.3 (1.3-13.2)
Myeloid leukaemia	**<5**	NR	**NR**	0 - 3.3	1028	2.6 (0 - 6.4)
Leukaemia, other	**0**					
Pancreas	**8**	1.8	**5.4**	1.6-9.3	191	10.3 (3.0-17.6)
Skin (NMSC exc. SCC/BCC)	**8**	1.8	**5.2**	1.6-8.9	205	11.4 (3.4-19.3)
Liver	**5**	1.1	**3.6**	0.4-6.8	248	6.1 (0.6-11.5)
Testis	**5**	1.1	**6.0**	0.5-11.5	210	6.9 (0.8-13.0)
Myeloma	**5**	1.1	**3.6**	0.4-6.8	169	5.8 (0.7-11.0)
Mesothelioma	**<5**	NR	**NR**	0 - 5.8	524	5.1 (0.0-10.1)
Thyroid gland	**<5**	NR	**NR**	0.0-8.4	237	5.2 (0.0-10.4)
All cancers	**456**	100.0	**350.7**	318-384	3	548.1 (497-599)

Females

	Cases	%	ASR
Breast	**106**	28.9	**83.5**
Colorectal	**50**	13.6	**32.8**
Colon	**37**	10.1	**22.8**
Rectum	**13**	3.5	**10.0**
Melanoma (skin)	**41**	11.2	**30.7**
Lung	**26**	7.1	**18.2**
Uterus	**17**	4.6	**11.0**
Kidney	**12**	3.3	**9.5**
Thyroid gland	**12**	3.3	**11.4**
Unknown primary	**12**	3.3	**7.8**
Pancreas	**10**	2.7	**6.2**
Leukaemia	**10**	2.7	**11.7**
Leukaemia NOS	**0**		
Lymphoid leukaemia	**<5**	NR	**NR**
Myeloid leukaemia	**NR**	1.6	**4.3**
Leukaemia, other	**0**		
Lymphoma	**8**	2.2	**8.1**
Lymphoma NOS	**0**		
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**NR**	1.6	**5.4**
Stomach	**6**	1.6	**3.2**
Ovary	**6**	1.6	**3.7**
Bladder & urinary tract	**5**	1.4	**2.7**
Brain	**5**	1.4	**3.5**
Small intestine	**<5**	NR	**NR**
Gallbladder / bile ducts	**<5**	NR	**NR**
Lip, gum & mouth	**<5**	NR	**NR**
Tongue	**<5**	NR	**NR**
All cancers	**367**	100.0	**274.6**

WA Country - all

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**410**	29.4	**103.9**	93.7-114	8	156.2 (141-172)
Colorectal	**171**	12.3	**42.9**	36.4-49.4	20	66.2 (56.0-76.5)
Colon	**94**	6.7	**23.5**	18.7-28.3	38	36.8 (29.2-44.5)
Rectum	**77**	5.5	**19.4**	15.0-23.8	43	29.4 (22.6-36.2)
Melanoma (skin)	**166**	11.9	**42.6**	35.9-49.2	23	65.6 (55.3-75.8)
Lung	**138**	9.9	**33.6**	27.9-39.2	26	58.3 (48.2-68.3)
Lymphoma	**56**	4.0	**15.1**	10.9-19.2	63	22.5 (16.5-28.6)
Lymphoma NOS	**<5**	NR	**NR**	0 - 1.1	2973	0.8 (0 - 2.0)
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 1.8	1037	0.8 (0 - 2.0)
NHL	**52**	3.7	**13.9**	9.9-17.8	68	20.9 (15.0-26.7)
Leukaemia	**47**	3.4	**11.8**	8.3-15.4	113	20.8 (14.6-26.9)
Leukaemia NOS	**<5**	NR	**NR**	0 - 1.3	741	0.9 (0 - 2.1)
Lymphoid leukaemia	**22**	1.6	**4.7**	2.7-6.7	343	9.7 (5.6-13.9)
Myeloid leukaemia	**23**	1.6	**6.6**	3.7-9.4	216	10.1 (5.8-14.4)
Leukaemia, other	**<5**	NR	**NR**			
Kidney	**45**	3.2	**11.6**	8.1-15.1	79	16.9 (11.8-21.9)
Lip, gum & mouth	**39**	2.8	**10.6**	7.2-13.9	81	14.8 (10.0-19.5)
Oesophagus	**30**	2.2	**7.2**	4.6-9.8	147	13 (8.1-17.8)
Pancreas	**27**	1.9	**6.0**	3.7-8.4	143	11.7 (7.2-16.2)
Bladder & urinary tract	**26**	1.9	**6.2**	3.8-8.6	142	11.4 (6.9-15.9)
Stomach	**25**	1.8	**6.3**	3.8-8.9	134	9.9 (5.9-13.9)
Brain	**23**	1.6	**6.2**	3.6-8.8	156	9.3 (5.4-13.2)
Unknown primary	**23**	1.6	**5.0**	2.9-7.1	328	11.1 (6.4-15.7)
Myeloma	**20**	1.4	**4.9**	2.7-7.1	138	7.8 (4.3-11.4)
Mesothelioma	**18**	1.3	**4.3**	2.3-6.3	245	7.3 (3.8-10.7)
Liver	**16**	1.1	**3.9**	2.0-5.8	187	6.8 (3.4-10.3)
Testis	**16**	1.1	**5.3**	2.7-8.0	237	5.9 (3.0-8.7)
Skin (NMSC exc. SCC/BCC)	**14**	1.0	**3.4**	1.6-5.2	296	6.3 (2.9-9.7)
Myelodysplastic diseases	**12**	0.9	**2.7**	1.2-4.3	463	6.1 (2.6-9.7)
Pharynx	**11**	0.8	**2.8**	1.2-4.5	267	3.6 (1.5-5.7)
All cancers	**1394**	100.0	**353.1**	334-372	3	555.2 (525-585)

Females

	Cases	%	ASR
Breast	**296**	29.0	**83.1**
Colorectal	**125**	12.2	**28.9**
Colon	**84**	8.2	**18.5**
Rectum	**38**	3.7	**9.7**
Melanoma (skin)	**110**	10.8	**30.4**
Lung	**86**	8.4	**21.6**
Uterus	**48**	4.7	**12.6**
Thyroid gland	**35**	3.4	**11.3**
Kidney	**30**	2.9	**8.8**
Leukaemia	**27**	2.6	**8.7**
Leukaemia NOS	**<5**	NR	**NR**
Lymphoid leukaemia	**13**	1.3	**5.2**
Myeloid leukaemia	**14**	1.4	**3.5**
Leukaemia, other	**<5**	NR	**NR**
Unknown primary	**26**	2.5	**5.7**
Ovary	**25**	2.4	**6.0**
Lymphoma	**25**	2.4	**7.1**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**22**	2.2	**6.0**
Cervix	**16**	1.6	**5.1**
Pancreas	**14**	1.4	**3.4**
Lip, gum & mouth	**12**	1.2	**3.1**
Gallbladder / bile ducts	**11**	1.1	**2.7**
Bladder & urinary tract	**11**	1.1	**2.2**
Brain	**11**	1.1	**3.3**
Myeloma	**11**	1.1	**3.0**
Vulva	**10**	1.0	**2.5**
Stomach	**9**	0.9	**1.8**
Liver	**9**	0.9	**2.5**
All cancers	**1021**	100.0	**274.7**

Appendix 3D. Cancer incidence, Western Australia, 2011: Leading types by sex and geographic area

North Metro AHS

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**827**	31.3	**118.7**	110-127	7	175.2 (163-187)
Colorectal	**322**	12.2	**44.0**	39.0-48.9	20	72.1 (64.1-80.1)
Colon	**203**	7.7	**27.3**	23.4-31.1	34	46.3 (39.8-52.7)
Rectum	**118**	4.5	**16.6**	13.5-19.6	51	25.6 (20.9-30.3)
Melanoma (skin)	**248**	9.4	**35.4**	30.8-39.9	26	54.7 (47.8-61.6)
Lung	**226**	8.6	**29.3**	25.3-33.2	28	52.7 (45.8-59.7)
Lymphoma	**123**	4.7	**18.5**	15.1-22.0	53	26.6 (21.8-31.3)
Lymphoma NOS	**<5**	NR	**NR**	0 - 0.6	2619	0.5 (0 - 1.3)
Hodgkin lymphoma	**<5**	NR	**NR**	2.1-5.6	294	4.3 (2.4-6.1)
NHL	**100**	3.8	**14.4**	11.5-17.4	66	21.8 (17.4-26.1)
Leukaemia	**79**	3.0	**12.4**	9.4-15.4	81	17.8 (13.8-21.7)
Leukaemia NOS	**<5**	NR	**NR**	0 - 0.7	3664	0.7 (0 - 1.5)
Lymphoid leukaemia	**50**	1.9	**8.2**	5.7-10.8	126	11.3 (8.1-14.4)
Myeloid leukaemia	**26**	1.0	**3.8**	2.3-5.4	238	5.8 (3.5-8.0)
Leukaemia, other	**<5**	NR	**NR**			
Kidney	**70**	2.7	**10.5**	8.0-13.0	86	14.9 (11.4-18.4)
Stomach	**59**	2.2	**7.9**	5.8-10.0	115	13.6 (10.1-17.1)
Pancreas	**59**	2.2	**8.1**	6.0-10.3	96	13.6 (10.1-17.1)
Unknown primary	**57**	2.2	**6.9**	5.0-8.7	170	13.8 (10.2-17.4)
Bladder & urinary tract	**55**	2.1	**7.0**	5.1-8.9	115	13.1 (9.6-16.7)
Mesothelioma	**43**	1.6	**5.7**	4.0-7.5	135	10.1 (7.1-13.2)
Testis	**41**	1.6	**7.7**	5.3-10.1	182	8.2 (5.7-10.7)
Myelodysplastic diseases	**38**	1.4	**4.6**	3.1-6.1	234	8.9 (6.0-11.7)
Liver	**37**	1.4	**5.2**	3.5-6.8	162	7.9 (5.3-10.5)
Brain	**37**	1.4	**6.3**	4.1-8.5	180	8 (5.4-10.6)
Myeloma	**37**	1.4	**4.9**	3.3-6.5	203	8.3 (5.6-11.1)
Lip, gum & mouth	**30**	1.1	**4.6**	2.9-6.3	201	6.2 (3.9-8.4)
Pharynx	**30**	1.1	**4.6**	2.9-6.3	171	6.3 (4.0-8.6)
Oesophagus	**30**	1.1	**3.9**	2.5-5.3	217	7 (4.5-9.5)
Thyroid gland	**24**	0.9	**3.9**	2.3-5.5	288	5 (3.0-7.0)
All cancers	**2638**	100.0	**374.5**	360-389	3	580.5 (558-603)

Females

	Cases	%	ASR
Breast	**571**	27.3	**79.8**
Colorectal	**270**	12.9	**32.4**
Colon	**181**	8.7	**20.9**
Rectum	**88**	4.2	**11.5**
Melanoma (skin)	**192**	9.2	**25.9**
Lung	**177**	8.5	**19.9**
Lymphoma	**106**	5.1	**14.5**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**93**	4.4	**12.2**
Uterus	**85**	4.1	**11.3**
Thyroid gland	**72**	3.4	**11.6**
Leukaemia	**70**	3.3	**9.1**
Leukaemia NOS	**<5**	NR	**NR**
Lymphoid leukaemia	**32**	1.5	**4.5**
Myeloid leukaemia	**36**	1.7	**4.5**
Leukaemia, other	**<5**	NR	**NR**
Ovary	**62**	3.0	**7.9**
Unknown primary	**50**	2.4	**4.5**
Pancreas	**48**	2.3	**5.1**
Kidney	**47**	2.2	**6.6**
Cervix	**31**	1.5	**4.7**
Bladder & urinary tract	**28**	1.3	**2.7**
Myeloma	**28**	1.3	**3.0**
Stomach	**23**	1.1	**2.8**
Myelodysplastic diseases	**21**	1.0	**1.9**
Lip, gum & mouth	**19**	0.9	**2.3**
Brain	**19**	0.9	**3.0**
Gallbladder / bile ducts	**17**	0.8	**1.7**
Skin (NMSC exc. SCC/BCC)	**17**	0.8	**2.2**
All cancers	**2091**	100.0	**271.1**

South Metro AHS

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**843**	32.2	**129.4**	121-138	6	194 (181-207)
Colorectal	**280**	10.7	**41.1**	36.1-46.1	21	67.3 (59.3-75.2)
Colon	**178**	6.8	**25.9**	21.9-29.8	33	42.8 (36.4-49.1)
Rectum	**102**	3.9	**15.2**	12.2-18.3	57	24.5 (19.7-29.3)
Melanoma (skin)	**256**	9.8	**40.2**	35.1-45.3	23	59.9 (52.5-67.3)
Lung	**228**	8.7	**31.4**	27.2-35.6	30	55.3 (48.1-62.6)
Lymphoma	**120**	4.6	**20.2**	16.5-24.0	49	28 (23.0-33.1)
Lymphoma NOS	**<5**	NR	**NR**	0 - 0.9	1642	0.7 (0 - 1.6)
Hodgkin lymphoma	**<5**	NR	**NR**	1.7-5.2	385	3.3 (1.6-5.0)
NHL	**102**	3.9	**16.4**	13.1-19.7	57	24 (19.3-28.7)
Kidney	**95**	3.6	**16.1**	12.8-19.4	50	21.9 (17.4-26.3)
Bladder & urinary tract	**86**	3.3	**11.1**	8.7-13.6	91	21.5 (16.9-26.1)
Leukaemia	**65**	2.5	**11.6**	8.5-14.7	86	15 (11.4-18.7)
Leukaemia NOS	**<5**	NR	**NR**			
Lymphoid leukaemia	**31**	1.2	**5.8**	3.6-8.0	159	7 (4.5-9.5)
Myeloid leukaemia	**34**	1.3	**5.8**	3.7-7.9	187	8 (5.3-10.7)
Leukaemia, other	**<5**	NR	**NR**			
Pancreas	**59**	2.3	**8.0**	5.8-10.1	144	14.4 (10.7-18.1)
Stomach	**53**	2.0	**7.3**	5.2-9.3	118	12.9 (9.4-16.4)
Unknown primary	**50**	1.9	**6.9**	4.8-8.9	142	12.5 (9.0-16.0)
Lip, gum & mouth	**39**	1.5	**6.7**	4.5-8.8	146	9.4 (6.4-12.4)
Myeloma	**38**	1.4	**5.5**	3.7-7.4	153	9.1 (6.2-12.0)
Brain	**37**	1.4	**6.6**	4.3-8.8	147	8.3 (5.6-11.1)
Oesophagus	**33**	1.3	**5.0**	3.2-6.7	161	7.7 (5.0-10.3)
Liver	**33**	1.3	**4.8**	3.1-6.5	255	8.2 (5.4-11.0)
Thyroid gland	**31**	1.2	**5.6**	3.6-7.7	208	7.3 (4.7-9.8)
Mesothelioma	**29**	1.1	**3.9**	2.4-5.3	216	7.2 (4.6-9.9)
Myelodysplastic diseases	**29**	1.1	**3.3**	2.0-4.5	513	7.8 (4.9-10.6)
Skin (NMSC exc. SCC/BCC)	**27**	1.0	**3.4**	2.1-4.8	399	6.9 (4.2-9.5)
Testis	**27**	1.0	**5.3**	3.3-7.3	243	6.1 (3.8-8.4)
All cancers	**2621**	100.0	**400.2**	384-416	3	618.9 (595-643)

Females

	Cases	%	ASR
Breast	**553**	30.1	**85.8**
Colorectal	**220**	12.0	**27.7**
Colon	**153**	8.3	**18.9**
Rectum	**65**	3.5	**8.5**
Lung	**143**	7.8	**18.7**
Melanoma (skin)	**141**	7.7	**21.7**
Lymphoma	**94**	5.1	**13.5**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**NR**	0.5	**2.3**
NHL	**80**	4.4	**11.0**
Uterus	**83**	4.5	**11.9**
Thyroid gland	**77**	4.2	**14.1**
Ovary	**46**	2.5	**7.4**
Leukaemia	**44**	2.4	**6.4**
Leukaemia NOS	**<5**	NR	**NR**
Lymphoid leukaemia	**25**	1.4	**3.8**
Myeloid leukaemia	**18**	1.0	**2.4**
Leukaemia, other	**<5**	NR	**NR**
Unknown primary	**40**	2.2	**4.1**
Pancreas	**37**	2.0	**4.7**
Brain	**36**	2.0	**5.6**
Myeloma	**33**	1.8	**4.3**
Stomach	**31**	1.7	**4.0**
Kidney	**30**	1.6	**4.9**
Bladder & urinary tract	**26**	1.4	**2.9**
Cervix	**22**	1.2	**3.9**
Vulva	**17**	0.9	**2.2**
Lip, gum & mouth	**16**	0.9	**2.2**
All cancers	**1838**	100.0	**266.1**

Appendix 3D. Cancer incidence, Western Australia, 2011: Leading types by sex and geographic area

WA Metro - all

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**1670**	31.8	**123.8**	118-130	7	184.3 (175-193)
Colorectal	**602**	11.4	**42.6**	39.1-46.1	21	69.8 (64.1-75.4)
Colon	**381**	7.2	**26.6**	23.9-29.4	33	44.6 (40.1-49.1)
Rectum	**220**	4.2	**15.9**	13.7-18.1	54	25 (21.7-28.4)
Melanoma (skin)	**504**	9.6	**37.7**	34.3-41.0	24	57.1 (52.1-62.2)
Lung	**454**	8.6	**30.2**	27.3-33.1	29	53.9 (48.9-58.9)
Lymphoma	**243**	4.6	**19.3**	16.8-21.9	51	27.2 (23.8-30.7)
Lymphoma NOS	**5**	0.1	**0.3**	0.0-0.6	2041	0.6 (0.1-1.2)
Hodgkin lymphoma	**36**	0.7	**3.6**	2.4-4.9	330	3.8 (2.6-5.1)
NHL	**202**	3.8	**15.3**	13.1-17.5	62	22.8 (19.6-26.0)
Kidney	**165**	3.1	**13.2**	11.1-15.3	64	18.3 (15.4-21.1)
Leukaemia	**144**	2.7	**12.0**	9.8-14.1	83	16.4 (13.7-19.1)
Leukaemia NOS	**<5**	NR	**NR**	0 - 0.4	7091	0.4 (0 - 0.8)
Lymphoid leukaemia	**81**	1.5	**7.1**	5.4-8.7	140	9.2 (7.2-11.2)
Myeloid leukaemia	**60**	1.1	**4.8**	3.5-6.0	212	6.8 (5.1-8.6)
Leukaemia, other	**<5**	NR	**NR**			
Bladder & urinary tract	**141**	2.7	**9.0**	7.4-10.5	102	17.2 (14.3-20.1)
Pancreas	**118**	2.2	**8.0**	6.5-9.5	115	14 (11.4-16.5)
Stomach	**112**	2.1	**7.6**	6.2-9.1	116	13.3 (10.8-15.8)
Unknown primary	**107**	2.0	**6.8**	5.5-8.2	155	13.2 (10.6-15.7)
Myeloma	**75**	1.4	**5.2**	4.0-6.4	175	8.7 (6.7-10.7)
Brain	**74**	1.4	**6.5**	4.9-8.0	162	8.1 (6.3-10.0)
Mesothelioma	**72**	1.4	**4.8**	3.7-6.0	165	8.7 (6.7-10.8)
Liver	**70**	1.3	**5.0**	3.8-6.2	197	8.1 (6.2-10.0)
Lip, gum & mouth	**69**	1.3	**5.6**	4.2-6.9	171	7.7 (5.9-9.5)
Testis	**68**	1.3	**6.5**	5.0-8.1	206	7.2 (5.5-8.9)
Myelodysplastic diseases	**67**	1.3	**4.0**	3.0-5.0	316	8.4 (6.3-10.4)
Oesophagus	**63**	1.2	**4.4**	3.3-5.5	187	7.3 (5.5-9.1)
Thyroid gland	**55**	1.0	**4.7**	3.4-6.0	245	6.1 (4.4-7.7)
Pharynx	**52**	1.0	**4.2**	3.0-5.3	191	5.6 (4.1-7.2)
All cancers	**5259**	100.0	**386.5**	376-397	3	598.7 (582-615)

Females

	Cases	%	ASR
Breast	**1124**	28.6	**82.7**
Colorectal	**490**	12.5	**30.2**
Colon	**334**	8.5	**20.0**
Rectum	**153**	3.9	**10.1**
Melanoma (skin)	**333**	8.5	**23.9**
Lung	**320**	8.1	**19.3**
Lymphoma	**200**	5.1	**14.0**
Lymphoma NOS	**6**	0.2	**0.2**
Hodgkin lymphoma	**21**	0.5	**2.2**
NHL	**173**	4.4	**11.6**
Uterus	**168**	4.3	**11.6**
Thyroid gland	**149**	3.8	**12.8**
Leukaemia	**114**	2.9	**7.8**
Leukaemia NOS	**<5**	NR	**NR**
Lymphoid leukaemia	**57**	1.5	**4.2**
Myeloid leukaemia	**54**	1.4	**3.4**
Leukaemia, other	**<5**	NR	**NR**
Ovary	**108**	2.7	**7.7**
Unknown primary	**90**	2.3	**4.3**
Pancreas	**85**	2.2	**4.9**
Kidney	**77**	2.0	**5.8**
Myeloma	**61**	1.6	**3.6**
Brain	**55**	1.4	**4.2**
Stomach	**54**	1.4	**3.4**
Bladder & urinary tract	**54**	1.4	**2.8**
Cervix	**53**	1.3	**4.4**
Lip, gum & mouth	**35**	0.9	**2.2**
Myelodysplastic diseases	**35**	0.9	**1.5**
Gallbladder / bile ducts	**32**	0.8	**1.7**
Skin (NMSC exc. SCC/BCC)	**32**	0.8	**2.2**
All cancers	**3929**	100.0	**268.8**

All Western Australia

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Prostate	**2086**	31.3	**119.6**	114-125	7	178.4 (171-186)
Colorectal	**775**	11.6	**42.9**	39.8-46.0	21	69.5 (64.5-74.4)
Colon	**475**	7.1	**26.0**	23.6-28.4	34	43.1 (39.2-47.0)
Rectum	**299**	4.5	**16.9**	14.9-18.8	50	26.3 (23.2-29.3)
Melanoma (skin)	**672**	10.1	**38.8**	35.8-41.9	24	59.1 (54.5-63.6)
Lung	**595**	8.9	**31.1**	28.5-33.7	28	55.2 (50.7-59.7)
Lymphoma	**299**	4.5	**18.4**	16.2-20.6	53	26.1 (23.1-29.1)
Lymphoma NOS	**7**	0.1	**0.4**	0.1-0.7	2180	0.7 (0.2-1.2)
Hodgkin lymphoma	**38**	0.6	**3.0**	2.0-4.0	391	3.1 (2.1-4.1)
NHL	**254**	3.8	**15.0**	13.1-16.9	63	22.3 (19.5-25.1)
Kidney	**210**	3.1	**12.8**	11.0-14.6	67	17.9 (15.5-20.4)
Leukaemia	**192**	2.9	**11.9**	10.1-13.8	88	17.2 (14.8-19.7)
Leukaemia NOS	**<5**	NR	**NR**	0.0-0.5	2443	0.5 (0.1-0.9)
Lymphoid leukaemia	**103**	1.5	**6.5**	5.1-7.8	162	9.2 (7.4-11.0)
Myeloid leukaemia	**84**	1.3	**5.2**	4.0-6.4	210	7.6 (5.9-9.2)
Leukaemia, other	**<5**	NR	**NR**			
Bladder & urinary tract	**167**	2.5	**8.4**	7.1-9.7	109	16 (13.5-18.4)
Pancreas	**145**	2.2	**7.6**	6.3-8.8	121	13.5 (11.2-15.7)
Stomach	**137**	2.1	**7.4**	6.1-8.7	120	12.6 (10.5-14.7)
Unknown primary	**130**	1.9	**6.4**	5.3-7.6	176	12.7 (10.5-14.9)
Lip, gum & mouth	**108**	1.6	**6.7**	5.4-8.0	136	9.3 (7.5-11.1)
Brain	**97**	1.5	**6.4**	5.0-7.7	161	8.3 (6.7-10.0)
Myeloma	**95**	1.4	**5.2**	4.1-6.2	166	8.5 (6.8-10.3)
Oesophagus	**94**	1.4	**5.0**	4.0-6.1	175	8.6 (6.8-10.3)
Mesothelioma	**90**	1.3	**4.7**	3.7-5.7	178	8.5 (6.7-10.2)
Liver	**86**	1.3	**4.7**	3.7-5.7	196	7.8 (6.1-9.4)
Testis	**85**	1.3	**6.4**	5.0-7.8	210	7 (5.5-8.5)
Myelodysplastic diseases	**79**	1.2	**3.7**	2.9-4.5	341	7.9 (6.1-9.6)
Thyroid gland	**65**	1.0	**4.3**	3.2-5.4	267	5.6 (4.2-6.9)
Skin (NMSC exc. SCC/BCC)	**64**	1.0	**3.4**	2.5-4.2	313	5.9 (4.5-7.4)
All cancers	**6671**	100.0	**379.9**	371-389	3	590.4 (576-605)

Females

	Cases	%	ASR
Breast	**1423**	28.7	**82.9**
Colorectal	**616**	12.4	**29.9**
Colon	**419**	8.4	**19.6**
Rectum	**191**	3.8	**10.0**
Melanoma (skin)	**443**	8.9	**25.2**
Lung	**407**	8.2	**19.9**
Lymphoma	**227**	4.6	**12.7**
Lymphoma NOS	**6**	0.1	**0.1**
Hodgkin lymphoma	**24**	0.5	**2.0**
NHL	**197**	4.0	**10.6**
Uterus	**216**	4.4	**11.8**
Thyroid gland	**184**	3.7	**12.5**
Leukaemia	**142**	2.9	**8.1**
Leukaemia NOS	**<5**	NR	**NR**
Lymphoid leukaemia	**71**	1.4	**4.5**
Myeloid leukaemia	**68**	1.4	**3.5**
Leukaemia, other	**<5**	NR	**NR**
Ovary	**133**	2.7	**7.3**
Unknown primary	**116**	2.3	**4.6**
Kidney	**108**	2.2	**6.5**
Pancreas	**100**	2.0	**4.6**
Myeloma	**72**	1.5	**3.5**
Cervix	**71**	1.4	**4.6**
Brain	**66**	1.3	**4.0**
Bladder & urinary tract	**65**	1.3	**2.7**
Stomach	**64**	1.3	**3.0**
Lip, gum & mouth	**47**	0.9	**2.4**
Gallbladder / bile ducts	**44**	0.9	**1.9**
Skin (NMSC exc. SCC/BCC)	**40**	0.8	**2.1**
Vulva	**40**	0.8	**1.9**
All cancers	**4965**	100.0	**270.9**

Appendix 3E. Cancer mortality, Western Australia, 2011: Leading types by sex and geographic area

CHS Kimberley Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Pancreas	**<5**	NR	**NR**	0 - 35.0	114	31.9 (0 - 76.4)
Prostate	**<5**	NR	**NR**	0 - 37.5	211	44.6 (0 - 100)
Lung	**<5**	NR	**NR**	0 - 21.9	211	23 (0 - 59.6)
Unknown primary	**<5**	NR	**NR**	0 - 28.5	57	13.3 (0 - 32.0)
Colorectal	**<5**	NR	**NR**	0 - 15.9	150	5.7 (0 - 16.8)
Colon	**<5**	NR	**NR**	0 - 15.9	150	5.7 (0 - 16.8)
Rectum	**0**				-	
Lip, gum & mouth	**<5**	NR	**NR**	0 - 19.3	92	7.7 (0 - 22.7)
Tongue	**<5**	NR	**NR**	0 - 11.7	305	5 (0 - 14.8)
Pharynx	**<5**	NR	**NR**	0 - 23.8	*	21.6 (0 - 63.7)
Nasopharynx	**<5**	NR	**NR**	0 - 11.3	211	4.9 (0 - 14.6)
Oesophagus	**<5**	NR	**NR**	0 - 12.0	248	5.4 (0 - 16.0)
Small intestine	**<5**	NR	**NR**	0 - 24.8	48	13.8 (0 - 40.8)
Liver	**<5**	NR	**NR**	0 - 11.3	211	4.9 (0 - 14.6)
Skin (NMSC inc. SCC/BCC)	**<5**	NR	**NR**	0 - 13.3	268	5.2 (0 - 15.5)
All cancer deaths	**19**	100.0	**102.6**	54.6-151	11	187.2 (87.1-287)

Females

	Cases	%	ASR
Lung	**<5**	NR	**NR**
Tongue	**<5**	NR	**NR**
Pharynx	**<5**	NR	**NR**
Gallbladder / bile ducts	**<5**	NR	**NR**
Breast	**<5**	NR	**NR**
Cervix	**<5**	NR	**NR**
Bladder & urinary tract	**<5**	NR	**NR**
Brain	**<5**	NR	**NR**
Unknown primary	**<5**	NR	**NR**
Leukaemia	**<5**	NR	**NR**
Leukaemia NOS	**0**		
Lymphoid leukaemia	**0**		
Myeloid leukaemia	**<5**	NR	**NR**
Leukaemia, other	**0**		
All cancer deaths	**13**	100.0	**76.6**

CHS Pilbara Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**<5**	NR	**NR**	0 - 66.9	33	65 (0 - 154)
Colorectal	**<5**	NR	**NR**	0 - 9.8	241	3.5 (0 - 10.4)
Colon	**<5**	NR	**NR**		-	
Rectum	**<5**	NR	**NR**	0 - 9.8	241	3.5 (0 - 10.4)
Tongue	**<5**	NR	**NR**	0 - 5.7	417	2.5 (0 - 7.4)
Pharynx	**<5**	NR	**NR**	0 - 5.7	417	2.5 (0 - 7.4)
Pancreas	**<5**	NR	**NR**	0 - 43.1	*	50 (0 - 147)
Mesothelioma	**<5**	NR	**NR**	0 - 20.6	87	8.2 (0 - 24.2)
Unknown primary	**<5**	NR	**NR**	0 - 37.3	*	33.9 (0 - 99.8)
Myeloma	**<5**	NR	**NR**	0 - 5.7	417	2.5 (0 - 7.4)
Myelodysplastic diseases	**<5**	NR	**NR**	0 - 37.3	*	33.9 (0 - 99.8)
All cancer deaths	**12**	100.0	**86.1**	25.8-146	19	201.9 (39.8-364)

Females

	Cases	%	ASR
Lung	**<5**	NR	**NR**
Breast	**<5**	NR	**NR**
Skin (NMSC inc. SCC/BCC)	**<5**	NR	**NR**
Vagina	**<5**	NR	**NR**
Ovary	**<5**	NR	**NR**
Lymphoma	**<5**	NR	**NR**
All cancer deaths	**10**	100.0	**96.1**

CHS Midwest Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**23**	32.4	**38.7**	22.4-54.9	23	65.8 (38.1-93.5)
Prostate	**9**	12.7	**14.9**	4.9-24.9	404	38.5 (12.6-64.4)
Colorectal	**6**	8.5	**9.8**	1.6-18.1	108	18.5 (2.9-34.1)
Colon	**<5**	NR	**NR**	0 - 7.3	295	5.5 (0 - 13.3)
Rectum	**<5**	NR	**NR**	0 - 13.9	171	12.9 (0 - 26.5)
Melanoma (skin)	**5**	7.0	**8.0**	0.8-15.3	211	16.5 (1.2-31.8)
Oesophagus	**<5**	NR	**NR**	0 - 11.0	245	8.6 (0 - 18.4)
Stomach	**<5**	NR	**NR**	0 - 9.2	*	12.1 (0 - 26.1)
Liver	**<5**	NR	**NR**	0 - 12.0	99	7.7 (0 - 16.4)
Pancreas	**<5**	NR	**NR**	0 - 11.6	224	8 (0 - 17.2)
Unknown primary	**<5**	NR	**NR**	0 - 8.9	442	9.1 (0 - 19.6)
Leukaemia	**<5**	NR	**NR**	0 - 10.0	*	12.6 (0 - 27.0)
Leukaemia NOS	**<5**	NR	**NR**		-	
Lymphoid leukaemia	**<5**	NR	**NR**		-	
Myeloid leukaemia	**<5**	NR	**NR**	0 - 10.0	*	12.6 (0 - 27.0)
Leukaemia, other	**<5**	NR	**NR**		-	
All cancer deaths	**71**	100.0	**118.2**	90.0-146	10	224.7 (171-279)

Females

	Cases	%	ASR
Colorectal	**10**	18.5	**13.4**
Colon	**<5**	NR	**NR**
Rectum	**<5**	NR	**NR**
Lung	**8**	14.8	**14.8**
Breast	**8**	14.8	**17.0**
Cervix	**<5**	NR	**NR**
Lymphoma	**<5**	NR	**NR**
Lymphoma NOS	**0**		
Hodgkin lymphoma	**0**		
NHL	**<5**	NR	**NR**
Pancreas	**<5**	NR	**NR**
Ovary	**<5**	NR	**NR**
Unknown primary	**<5**	NR	**NR**
Skin (NMSC inc. SCC/BCC)	**<5**	NR	**NR**
Kidney	**<5**	NR	**NR**
All cancer deaths	**54**	100.0	**98.1**

Appendix 3E. Cancer mortality, Western Australia, 2011: Leading types by sex and geographic area

CHS Wheatbelt Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**18**	19.1	**22.1**	11.6-32.6	39	37.7 (19.9-55.4)
Prostate	**12**	12.8	**13.6**	5.7-21.6	135	29.7 (12.6-46.8)
Colorectal	**11**	11.7	**11.8**	4.6-19.0	82	24.5 (9.7-39.2)
Colon	**<5**	NR	**NR**	1.7-13.1	138	15.9 (3.8-27.9)
Rectum	**<5**	NR	**NR**	0 - 8.7	203	8.6 (0.0-17.2)
Oesophagus	**7**	7.4	**8.9**	2.1-15.8	118	14.2 (3.5-24.9)
Brain	**7**	7.4	**11.5**	2.1-20.9	116	15.9 (3.8-27.9)
Liver	**5**	5.3	**6.2**	0.7-11.8	125	11.9 (1.4-22.5)
Melanoma (skin)	**5**	5.3	**6.3**	0.0-12.5	188	12.9 (1.5-24.4)
Bladder & urinary tract	**<5**	NR	**NR**	0.0-9.4	203	9.5 (0.0-18.9)
Stomach	**<5**	NR	**NR**	0 - 9.2	153	5.8 (0 - 12.4)
Pancreas	**<5**	NR	**NR**	0 - 7.7	286	5.8 (0 - 12.6)
Mesothelioma	**<5**	NR	**NR**	0 - 6.4	314	7.1 (0 - 15.2)
Unknown primary	**<5**	NR	**NR**	0 - 6.4	*	8.1 (0 - 17.2)
Leukaemia	**<5**	NR	**NR**	0 - 7.8	157	7.3 (0 - 15.6)
All cancer deaths	**94**	100.0	**115.8**	91.3-140	9	213.6 (170-257)

Females

	Cases	%	ASR
Lung	**14**	25.0	**20.8**
Breast	**7**	12.5	**11.0**
Colorectal	**6**	10.7	**6.8**
Colon	**<5**	NR	**NR**
Rectum	**<5**	NR	**NR**
Lymphoma	**5**	8.9	**6.1**
Lymphoma NOS	**0**		
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**<5**	NR	**NR**
Ovary	**<5**	NR	**NR**
Kidney	**<5**	NR	**NR**
Melanoma (skin)	**<5**	NR	**NR**
Cervix	**<5**	NR	**NR**
Brain	**<5**	NR	**NR**
Leukaemia	**<5**	NR	**NR**
All cancer deaths	**56**	100.0	**72.7**

CHS Goldfields Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**15**	35.7	**42.8**	21.0-64.7	17	59.4 (27.6-91.2)
Stomach	**<5**	NR	**NR**	0.1-21.6	79	19.6 (0 - 40.2)
Unknown primary	**<5**	NR	**NR**	0.2-23.3	105	18.3 (0 - 38.6)
Colorectal	**<5**	NR	**NR**	0 - 13.1	172	6.4 (0 - 15.2)
Colon	**0**				-	
Rectum	**<5**	NR	**NR**	0 - 13.1	172	6.4 (0 - 15.2)
Lip, gum & mouth	**<5**	NR	**NR**	0 - 12.7	268	10.9 (0 - 27.3)
Oesophagus	**<5**	NR	**NR**	0 - 15.2	82	8.7 (0 - 21.3)
Melanoma (skin)	**<5**	NR	**NR**	0 - 16.4	324	14.9 (0 - 38.5)
Kidney	**<5**	NR	**NR**	0 - 16.2	418	14.9 (0 - 38.5)
Leukaemia	**<5**	NR	**NR**	0 - 16.1	60	11.1 (0 - 26.5)
Myeloma	**<5**	NR	**NR**	0 - 16.3	169	13 (0 - 32.0)
All cancer deaths	**42**	100.0	**125.0**	86.9-163	7	208.1 (139-278)

Females

	Cases	%	ASR
Breast	**<5**	NR	**NR**
Unknown primary	**<5**	NR	**NR**
Lung	**<5**	NR	**NR**
Colorectal	**<5**	NR	**NR**
Colon	**<5**	NR	**NR**
Rectum	**<5**	NR	**NR**
Gallbladder / bile ducts	**<5**	NR	**NR**
Skin (NMSC inc. SCC/BCC)	**<5**	NR	**NR**
Oesophagus	**<5**	NR	**NR**
Liver	**<5**	NR	**NR**
Pancreas	**<5**	NR	**NR**
Peritoneum/retro-p.	**<5**	NR	**NR**
Cervix	**<5**	NR	**NR**
Uterus	**<5**	NR	**NR**
Lymphoma	**<5**	NR	**NR**
All cancer deaths	**25**	100.0	**72.3**

CHS Great Southern Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**12**	17.6	**19.7**	7.9-31.4	54	35.3 (15.1-55.6)
Prostate	**12**	17.6	**15.4**	6.4-24.4	91	37.8 (16.4-59.2)
Melanoma (skin)	**8**	11.8	**12.6**	3.6-21.6	75	23.4 (7.0-39.7)
Colorectal	**6**	8.8	**9.5**	1.7-17.4	105	17 (3.2-30.7)
Colon	**<5**	NR	**NR**	0 - 14.1	105	10.3 (0.1-20.6)
Rectum	**<5**	NR	**NR**	0 - 5.9	*	6.6 (0 - 15.8)
Unknown primary	**5**	7.4	**7.6**	0.7-14.5	153	15.6 (1.9-29.2)
Lymphoma	**4**	5.9	**5.2**	0 - 10.5	300	11.4 (0.2-22.6)
Lymphoma NOS	**<5**	NR	**NR**		-	
Hodgkin lymphoma	**<5**	NR	**NR**		-	
NHL	**<5**	NR	**NR**	0 - 10.5	300	11.4 (0.2-22.6)
Leukaemia	**<5**	NR	**NR**	0 - 7.1	*	9.6 (0 - 20.4)
All cancer deaths	**68**	100.0	**100.7**	75.6-126	13	204.7 (156-253)

Females

	Cases	%	ASR
Breast	**6**	12.8	**10.6**
Colorectal	**5**	10.6	**9.0**
Colon	**<5**	NR	**NR**
Rectum	**<5**	NR	**NR**
Pancreas	**<5**	NR	**NR**
Lung	**<5**	NR	**NR**
Stomach	**<5**	NR	**NR**
Lymphoma	**<5**	NR	**NR**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**<5**	NR	**NR**
All cancer deaths	**47**	100.0	**71.0**

Appendix 3E. Cancer mortality, Western Australia, 2011: Leading types by sex and geographic area

CHS South West Region

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**45**	25.6	**30.6**	21.4-39.7	36	58.3 (41.0-75.6)
Melanoma (skin)	**18**	10.2	**12.4**	6.1-18.6	122	23.1 (12.3-34.0)
Prostate	**16**	9.1	**10.6**	5.2-15.9	100	21.4 (10.8-32.1)
Colorectal	**15**	8.5	**9.5**	4.5-14.5	122	19.6 (9.5-29.6)
Colon	**9**	5.1	**5.5**	1.8-9.3	289	11.5 (3.8-19.1)
Rectum	**6**	3.4	**4.0**	0.7-7.2	209	8.1 (1.6-14.6)
Pancreas	**10**	5.7	**6.6**	2.3-10.9	215	12.9 (4.7-21.0)
Mesothelioma	**8**	4.5	**5.6**	1.7-9.5	165	10.5 (3.1-17.9)
Oesophagus	**7**	4.0	**6.0**	1.5-10.5	151	8.2 (2.0-14.3)
Brain	**7**	4.0	**6.1**	1.2-10.9	130	9.2 (2.3-16.1)
Stomach	**6**	3.4	**4.7**	0.8-8.6	189	6.4 (1.2-11.6)
Skin (NMSC inc. SCC/BCC)	**6**	3.4	**4.0**	0.7-7.2	480	7.9 (1.4-14.4)
Unknown primary	**6**	3.4	**5.1**	0.3-9.8	360	7.9 (1.5-14.2)
Bladder & urinary tract	**5**	2.8	**3.8**	0.4-7.2	197	5.4 (0.6-10.3)
Myelodysplastic diseases	**5**	2.8	**2.8**	0.3-5.4	728	6.9 (0.8-13.1)
Lymphoma	**<5**	NR	**NR**	0 - 4.5	960	5.2 (0.0-10.4)
Lymphoma NOS	**0**				-	
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 1.2	*	1.3 (0 - 4.0)
NHL	**<5**	NR	**NR**	0 - 4.0	960	3.9 (0 - 8.3)
Leukaemia	**<5**	NR	**NR**	0.0-6.9	180	4.4 (0.1-8.8)
Leukaemia NOS	**<5**	NR	**NR**	0 - 2.3	510	1.3 (0 - 3.8)
Lymphoid leukaemia	**<5**	NR	**NR**	0 - 4.5	445	2.2 (0 - 5.2)
Myeloid leukaemia	**<5**	NR	**NR**	0 - 2.4	728	1 (0 - 2.9)
Leukaemia, other	**0**				-	
Liver	**<5**	NR	**NR**	0 - 4.9	523	3.6 (0 - 7.7)
Kidney	**<5**	NR	**NR**	0 - 4.8	414	3.4 (0 - 7.3)
Myeloma	**<5**	NR	**NR**	0 - 2.9	510	2.6 (0 - 6.3)
All cancer deaths	**176**	100.0	**123.9**	105-143	9	224 (191-257)

Females

	Cases	%	ASR
Lung	**20**	16.4	**9.9**
Colorectal	**13**	10.7	**5.7**
Colon	**<5**	NR	**NR**
Rectum	**<5**	NR	**NR**
Breast	**13**	10.7	**8.8**
Melanoma (skin)	**10**	8.2	**5.9**
Unknown primary	**10**	8.2	**5.4**
Ovary	**7**	5.7	**4.8**
Leukaemia	**6**	4.9	**4.5**
Leukaemia NOS	**0**		
Lymphoid leukaemia	**<5**	NR	**NR**
Myeloid leukaemia	**<5**	NR	**NR**
Leukaemia, other	**0**		
Lymphoma	**5**	4.1	**3.1**
Lymphoma NOS	**0**		
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**<5**	NR	**NR**
Stomach	**<5**	NR	**NR**
Liver	**<5**	NR	**NR**
Pancreas	**<5**	NR	**NR**
Uterus	**<5**	NR	**NR**
Kidney	**<5**	NR	**NR**
Brain	**<5**	NR	**NR**
Myeloma	**<5**	NR	**NR**
Oesophagus	**<5**	NR	**NR**
Peritoneum/retro-p.	**<5**	NR	**NR**
Cervix	**<5**	NR	**NR**
Myelodysplastic diseases	**<5**	NR	**NR**
All cancer deaths	**122**	100.0	**69.1**

WA Country - all

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**119**	24.7	**28.3**	23.1-33.4	34	50.5 (41.1-59.9)
Prostate	**53**	11.0	**11.6**	8.4-14.8	132	26.7 (19.3-34.0)
Colorectal	**42**	8.7	**9.6**	6.6-12.5	110	18.4 (12.7-24.1)
Colon	**23**	4.8	**5.1**	3.0-7.3	209	9.9 (5.7-14.1)
Rectum	**19**	3.9	**4.4**	2.4-6.5	230	8.5 (4.5-12.4)
Melanoma (skin)	**38**	7.9	**8.6**	5.8-11.4	160	17.3 (11.6-23.0)
Unknown primary	**24**	5.0	**5.8**	3.4-8.3	264	10.9 (6.4-15.4)
Pancreas	**23**	4.8	**5.2**	3.0-7.3	225	9.7 (5.6-13.8)
Oesophagus	**22**	4.6	**5.4**	3.1-7.6	180	8.3 (4.7-11.8)
Stomach	**18**	3.7	**4.4**	2.3-6.4	230	7.5 (3.9-11.0)
Brain	**16**	3.3	**4.4**	2.2-6.6	220	6.6 (3.2-9.9)
Leukaemia	**15**	3.1	**3.7**	1.8-5.6	219	7.3 (3.5-11.0)
Leukaemia NOS	**<5**	NR	**NR**	0 - 1.3	741	0.9 (0 - 2.1)
Lymphoid leukaemia	**<5**	NR	**NR**	0 - 1.9	1382	1.7 (0 - 3.4)
Myeloid leukaemia	**9**	1.9	**2.2**	0.8-3.6	400	4.7 (1.6-7.8)
Leukaemia, other	**0**				-	
Liver	**14**	2.9	**3.4**	1.6-5.2	235	5.7 (2.6-8.9)
Mesothelioma	**14**	2.9	**3.4**	1.6-5.2	249	6.3 (2.9-9.7)
Bladder & urinary tract	**14**	2.9	**3.4**	1.6-5.2	260	6.2 (2.9-9.6)
Skin (NMSC inc. SCC/BCC)	**10**	2.1	**2.3**	0.9-3.8	825	4.7 (1.6-7.7)
Lymphoma	**10**	2.1	**2.1**	0.8-3.4	1229	5 (1.8-8.2)
Lymphoma NOS	**<5**	NR	**NR**		-	
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 0.4	*	0.5 (0 - 1.5)
NHL	**9**	1.9	**1.9**	0.6-3.2	1229	4.5 (1.5-7.5)
Kidney	**7**	1.5	**1.8**	0.5-3.1	532	2.8 (0.6-4.9)
Myelodysplastic diseases	**7**	1.5	**1.5**	0.4-2.6	2096	3.8 (0.9-6.6)
Myeloma	**6**	1.2	**1.4**	0.3-2.6	472	2.6 (0.5-4.7)
Lip, gum & mouth	**5**	1.0	**1.2**	0.1-2.3	775	2 (0.2-3.8)
Pharynx	**5**	1.0	**1.2**	0.1-2.2	983	2 (0.2-3.8)
All cancer deaths	**482**	100.0	**113.2**	103-124	10	212.6 (193-232)

Females

	Cases	%	ASR
Lung	**57**	17.4	**13.4**
Breast	**41**	12.5	**11.0**
Colorectal	**36**	11.0	**7.0**
Colon	**25**	7.6	**4.9**
Rectum	**11**	3.4	**2.1**
Unknown primary	**19**	5.8	**4.1**
Lymphoma	**19**	5.8	**4.3**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**16**	4.9	**3.3**
Ovary	**16**	4.9	**4.2**
Melanoma (skin)	**13**	4.0	**2.9**
Cervix	**12**	3.7	**3.4**
Leukaemia	**12**	3.7	**2.8**
Leukaemia NOS	**0**		
Lymphoid leukaemia	**<5**	NR	**NR**
Myeloid leukaemia	**<5**	NR	**NR**
Leukaemia, other	**0**		
Pancreas	**11**	3.4	**2.3**
Kidney	**8**	2.4	**2.1**
Brain	**8**	2.4	**2.3**
Stomach	**7**	2.1	**1.1**
Liver	**7**	2.1	**1.7**
Skin (NMSC inc. SCC/BCC)	**7**	2.1	**1.3**
Uterus	**7**	2.1	**1.4**
Bladder & urinary tract	**5**	1.5	**1.1**
Myeloma	**5**	1.5	**1.2**
Myelodysplastic diseases	**5**	1.5	**0.7**
All cancer deaths	**327**	100.0	**75.1**

Appendix 3E. Cancer mortality, Western Australia, 2011: Leading types by sex and geographic area

North Metro AHS

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**154**	18.4	**18.8**	15.7-21.9	47	37 (31.1-42.9)
Prostate	**90**	10.8	**9.6**	7.5-11.6	174	23.1 (18.3-27.9)
Colorectal	**83**	9.9	**10.7**	8.3-13.1	88	19.2 (15.0-23.4)
Colon	**57**	6.8	**7.3**	5.4-9.3	127	13.1 (9.6-16.6)
Rectum	**26**	3.1	**3.3**	2.0-4.7	289	6.1 (3.8-8.5)
Melanoma (skin)	**47**	5.6	**6.0**	4.2-7.8	166	11.2 (8.0-14.5)
Pancreas	**44**	5.3	**6.0**	4.2-7.8	151	10.1 (7.1-13.1)
Unknown primary	**44**	5.3	**5.3**	3.7-6.9	203	10.5 (7.4-13.7)
Stomach	**34**	4.1	**4.1**	2.7-5.6	308	8.1 (5.4-10.9)
Leukaemia	**33**	3.9	**4.4**	2.8-6.0	207	7.6 (5.0-10.3)
Leukaemia NOS	**0**				-	
Lymphoid leukaemia	**16**	1.9	**2.2**	1.0-3.4	381	3.9 (2.0-5.8)
Myeloid leukaemia	**17**	2.0	**2.2**	1.1-3.3	452	3.8 (1.9-5.6)
Leukaemia, other	**0**				-	
Mesothelioma	**31**	3.7	**3.8**	2.4-5.2	271	7.6 (4.9-10.4)
Brain	**29**	3.5	**4.2**	2.6-5.7	232	6.1 (3.8-8.4)
Bladder & urinary tract	**28**	3.3	**3.0**	1.8-4.1	537	7.3 (4.6-9.9)
Liver	**27**	3.2	**3.9**	2.4-5.4	192	6.1 (3.8-8.5)
Lymphoma	**25**	3.0	**3.5**	2.1-5.0	261	5.6 (3.4-7.9)
Lymphoma NOS	**0**				-	
Hodgkin lymphoma	**3**	0.4	**0.6**	0 - 1.3	2898	0.7 (0 - 1.5)
NHL	**22**	2.6	**2.9**	1.7-4.2	287	4.9 (2.8-7.0)
Oesophagus	**23**	2.7	**2.9**	1.7-4.1	314	5.5 (3.2-7.8)
Myeloma	**20**	2.4	**2.5**	1.4-3.6	452	4.7 (2.6-6.7)
Kidney	**18**	2.2	**2.4**	1.2-3.5	329	4.1 (2.2-6.1)
Pharynx	**17**	2.0	**2.3**	1.2-3.5	367	3.8 (2.0-5.6)
Myelodysplastic diseases	**15**	1.8	**1.9**	0.9-3.0	440	3.6 (1.8-5.4)
Skin (NMSC inc. SCC/BCC)	**13**	1.6	**1.5**	0.6-2.3	889	3.2 (1.4-4.9)
Gallbladder / bile ducts	**10**	1.2	**1.2**	0.4-1.9	1032	2.5 (0.9-4.0)
Lip, gum & mouth	**8**	1.0	**1.1**	0.3-1.9	784	1.7 (0.5-2.9)
All cancer deaths	**837**	100.0	**105.1**	97.8-112	10	198.8 (185-212)

Females

	Cases	%	ASR
Lung	**119**	17.4	**12.7**
Breast	**98**	14.3	**11.6**
Colorectal	**79**	11.6	**7.3**
Colon	**57**	8.3	**5.2**
Rectum	**22**	3.2	**2.1**
Unknown primary	**41**	6.0	**3.1**
Pancreas	**40**	5.9	**4.2**
Ovary	**38**	5.6	**4.3**
Leukaemia	**32**	4.7	**3.0**
Leukaemia NOS	**<5**	NR	**NR**
Lymphoid leukaemia	**9**	1.3	**0.8**
Myeloid leukaemia	**21**	3.1	**2.1**
Leukaemia, other	**<5**	NR	**NR**
Lymphoma	**26**	3.8	**2.5**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**22**	3.2	**1.9**
Brain	**23**	3.4	**3.1**
Stomach	**20**	2.9	**2.1**
Gallbladder / bile ducts	**18**	2.6	**1.7**
Melanoma (skin)	**17**	2.5	**1.6**
Uterus	**17**	2.5	**1.7**
Bladder & urinary tract	**15**	2.2	**1.2**
Myeloma	**13**	1.9	**1.3**
Myelodysplastic diseases	**12**	1.8	**1.1**
Liver	**8**	1.2	**0.8**
Kidney	**7**	1.0	**0.7**
Oesophagus	**6**	0.9	**0.5**
Cervix	**6**	0.9	**0.9**
Mesothelioma	**5**	0.7	**0.8**
All cancer deaths	**683**	100.0	**71.3**

South Metro AHS

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**184**	20.7	**25.0**	21.2-28.8	36	45.5 (38.9-52.1)
Prostate	**108**	12.1	**12.1**	9.7-14.5	131	28.7 (23.3-34.1)
Colorectal	**97**	10.9	**13.2**	10.5-15.9	76	24.1 (19.2-28.9)
Colon	**62**	7.0	**8.0**	5.9-10.1	137	15.6 (11.7-19.6)
Rectum	**35**	3.9	**5.2**	3.4-7.0	169	8.4 (5.6-11.2)
Melanoma (skin)	**46**	5.2	**6.4**	4.5-8.3	158	11.5 (8.2-14.9)
Bladder & urinary tract	**42**	4.7	**5.3**	3.6-7.0	212	10.8 (7.5-14.1)
Stomach	**40**	4.5	**5.5**	3.7-7.2	179	9.9 (6.8-13.0)
Mesothelioma	**37**	4.2	**4.7**	3.1-6.3	181	9.3 (6.3-12.3)
Pancreas	**36**	4.0	**4.6**	3.1-6.2	236	9.1 (6.1-12.1)
Unknown primary	**36**	4.0	**4.7**	3.1-6.3	185	9 (6.1-12.0)
Leukaemia	**35**	3.9	**4.8**	3.1-6.6	311	8.7 (5.8-11.6)
Leukaemia NOS	**<5**	NR	**NR**	0 - 0.6	6072	0.3 (0 - 0.7)
Lymphoid leukaemia	**15**	1.7	**1.7**	0.8-2.7	760	3.7 (1.8-5.6)
Myeloid leukaemia	**19**	2.1	**2.9**	1.5-4.4	577	4.8 (2.6-6.9)
Leukaemia, other	**<5**	NR	**NR**		-	
Brain	**28**	3.1	**4.7**	2.9-6.6	204	6.5 (4.0-8.9)
Oesophagus	**27**	3.0	**4.3**	2.6-5.9	184	6.4 (4.0-8.9)
Lymphoma	**25**	2.8	**3.2**	1.9-4.5	316	6.3 (3.8-8.8)
Lymphoma NOS	**<5**	NR	**NR**	0 - 0.6	2554	0.5 (0 - 1.3)
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 0.5	2554	0.3 (0 - 0.8)
NHL	**22**	2.5	**2.7**	1.5-3.9	419	5.5 (3.2-7.9)
Liver	**22**	2.5	**3.0**	1.7-4.4	372	5.5 (3.2-7.9)
Kidney	**21**	2.4	**3.5**	1.9-5.1	223	5.2 (2.9-7.4)
Skin (NMSC inc. SCC/BCC)	**16**	1.8	**1.8**	0.9-2.8	958	4.1 (2.1-6.2)
Myeloma	**15**	1.7	**2.0**	0.9-3.0	418	3.7 (1.8-5.6)
Gallbladder / bile ducts	**13**	1.5	**1.7**	0.8-2.7	601	3.3 (1.5-5.2)
Myelodysplastic diseases	**9**	1.0	**0.9**	0.3-1.6	2554	2.5 (0.9-4.1)
Pharynx	**8**	0.9	**1.2**	0.4-2.1	579	1.9 (0.5-3.2)
Tongue	**5**	0.6	**0.7**	0.1-1.4	1476	1.2 (0.1-2.2)
All cancer deaths	**890**	100.0	**119.6**	111-128	9	223 (208-238)

Females

	Cases	%	ASR
Lung	**116**	19.1	**14.3**
Breast	**99**	16.3	**12.7**
Colorectal	**78**	12.9	**7.6**
Colon	**56**	9.2	**5.2**
Rectum	**22**	3.6	**2.4**
Unknown primary	**35**	5.8	**3.1**
Pancreas	**30**	4.9	**3.4**
Lymphoma	**28**	4.6	**2.7**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**27**	4.4	**2.7**
Ovary	**26**	4.3	**3.5**
Leukaemia	**22**	3.6	**2.3**
Leukaemia NOS	**<5**	NR	**NR**
Lymphoid leukaemia	**<5**	NR	**NR**
Myeloid leukaemia	**18**	3.0	**1.9**
Leukaemia, other	**<5**	NR	**NR**
Brain	**21**	3.5	**2.7**
Melanoma (skin)	**16**	2.6	**2.0**
Uterus	**15**	2.5	**2.1**
Myeloma	**15**	2.5	**1.5**
Stomach	**14**	2.3	**1.6**
Myelodysplastic diseases	**11**	1.8	**0.9**
Liver	**10**	1.6	**1.3**
Bladder & urinary tract	**10**	1.6	**1.3**
Kidney	**8**	1.3	**0.7**
Gallbladder / bile ducts	**7**	1.2	**0.5**
Oesophagus	**6**	1.0	**0.5**
Peritoneum/retro-p.	**6**	1.0	**1.0**
Cervix	**5**	0.8	**0.8**
All cancer deaths	**607**	100.0	**69.9**

Appendix 3E. Cancer mortality, Western Australia, 2011: Leading types by sex and geographic area

WA Metro - all

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**338**	19.6	**21.7**	19.3-24.2	41	41 (36.6-45.5)
Prostate	**198**	11.5	**10.8**	9.3-12.4	150	25.8 (22.2-29.4)
Colorectal	**180**	10.4	**11.9**	10.1-13.7	82	21.6 (18.4-24.8)
Colon	**119**	6.9	**7.7**	6.2-9.1	131	14.3 (11.7-17.0)
Rectum	**61**	3.5	**4.2**	3.1-5.3	216	7.2 (5.4-9.1)
Melanoma (skin)	**93**	5.4	**6.2**	4.9-7.5	162	11.4 (9.0-13.7)
Pancreas	**80**	4.6	**5.3**	4.1-6.6	182	9.6 (7.5-11.8)
Unknown primary	**80**	4.6	**5.0**	3.9-6.1	194	9.8 (7.7-12.0)
Stomach	**74**	4.3	**4.8**	3.7-5.9	228	9 (6.9-11.1)
Bladder & urinary tract	**70**	4.1	**4.1**	3.1-5.1	309	9 (6.9-11.1)
Mesothelioma	**68**	3.9	**4.3**	3.2-5.3	218	8.4 (6.4-10.5)
Leukaemia	**68**	3.9	**4.6**	3.4-5.8	248	8.1 (6.2-10.1)
Leukaemia NOS	**<5**	NR	**NR**	0 - 0.3	*	0.1 (0 - 0.3)
Lymphoid leukaemia	**31**	1.8	**2.0**	1.2-2.7	505	3.8 (2.5-5.2)
Myeloid leukaemia	**36**	2.1	**2.5**	1.6-3.4	507	4.2 (2.8-5.6)
Leukaemia, other	**<5**	NR	**NR**		-	
Brain	**57**	3.3	**4.5**	3.2-5.7	217	6.3 (4.6-8.0)
Oesophagus	**50**	2.9	**3.5**	2.5-4.5	235	5.9 (4.3-7.6)
Lymphoma	**50**	2.9	**3.4**	2.4-4.3	284	6 (4.3-7.7)
Lymphoma NOS	**<5**	NR	**NR**	0 - 0.3	5172	0.3 (0 - 0.6)
Hodgkin lymphoma	**<5**	NR	**NR**	0 - 0.8	2655	0.5 (0.0-1.0)
NHL	**44**	2.5	**2.8**	2.0-3.7	339	5.3 (3.7-6.8)
Liver	**49**	2.8	**3.5**	2.5-4.5	251	5.9 (4.2-7.5)
Kidney	**39**	2.3	**2.9**	1.9-3.8	268	4.6 (3.1-6.1)
Myeloma	**35**	2.0	**2.3**	1.5-3.0	432	4.2 (2.8-5.6)
Skin (NMSC inc. SCC/BCC)	**29**	1.7	**1.6**	1.0-2.3	927	3.7 (2.3-5.0)
Pharynx	**25**	1.4	**1.8**	1.1-2.5	443	2.9 (1.7-4.0)
Myelodysplastic diseases	**24**	1.4	**1.5**	0.8-2.1	738	3.1 (1.8-4.3)
Gallbladder / bile ducts	**23**	1.3	**1.4**	0.8-2.1	766	2.9 (1.7-4.1)
Tongue	**13**	0.8	**1.0**	0.5-1.6	720	1.4 (0.6-2.2)
All cancer deaths	**1727**	100.0	**112.1**	107-118	9	210.4 (200-220)

Females

	Cases	%	ASR
Lung	**235**	18.2	**13.4**
Breast	**197**	15.3	**12.1**
Colorectal	**157**	12.2	**7.5**
Colon	**113**	8.8	**5.2**
Rectum	**44**	3.4	**2.3**
Unknown primary	**76**	5.9	**3.1**
Pancreas	**70**	5.4	**3.8**
Ovary	**64**	5.0	**3.9**
Lymphoma	**54**	4.2	**2.6**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**49**	3.8	**2.3**
Leukaemia	**54**	4.2	**2.7**
Leukaemia NOS	**<5**	NR	**NR**
Lymphoid leukaemia	**13**	1.0	**0.6**
Myeloid leukaemia	**39**	3.0	**2.0**
Leukaemia, other	**<5**	NR	**NR**
Brain	**44**	3.4	**2.9**
Stomach	**34**	2.6	**1.9**
Melanoma (skin)	**33**	2.6	**1.8**
Uterus	**32**	2.5	**1.9**
Myeloma	**28**	2.2	**1.4**
Gallbladder / bile ducts	**25**	1.9	**1.1**
Bladder & urinary tract	**25**	1.9	**1.3**
Myelodysplastic diseases	**23**	1.8	**1.0**
Liver	**18**	1.4	**1.1**
Kidney	**15**	1.2	**0.7**
Oesophagus	**12**	0.9	**0.5**
Cervix	**11**	0.9	**0.8**
Peritoneum/retro-p.	**9**	0.7	**0.6**
All cancer deaths	**1290**	100.0	**70.6**

All Western Australia

Males

	Cases	%	ASR	95%c.i.	Risk	ASR_A01
Lung	**462**	20.7	**23.5**	21.3-25.7	39	43.7 (39.6-47.7)
Prostate	**253**	11.3	**11.1**	9.7-12.5	144	26.2 (23.0-29.5)
Colorectal	**224**	10.0	**11.5**	9.9-13.0	85	21.1 (18.3-23.9)
Colon	**142**	6.4	**7.1**	5.9-8.3	144	13.4 (11.2-15.7)
Rectum	**82**	3.7	**4.4**	3.4-5.3	208	7.6 (6.0-9.3)
Melanoma (skin)	**134**	6.0	**6.9**	5.7-8.1	158	12.8 (10.6-15.0)
Unknown primary	**105**	4.7	**5.3**	4.2-6.3	201	10.2 (8.2-12.1)
Pancreas	**104**	4.7	**5.4**	4.3-6.4	188	9.7 (7.8-11.6)
Stomach	**92**	4.1	**4.7**	3.7-5.7	228	8.7 (6.9-10.5)
Mesothelioma	**85**	3.8	**4.2**	3.3-5.1	224	8.3 (6.5-10.1)
Bladder & urinary tract	**85**	3.8	**4.0**	3.1-4.9	296	8.6 (6.7-10.4)
Leukaemia	**83**	3.7	**4.4**	3.4-5.4	242	8 (6.2-9.7)
Leukaemia NOS	**<5**	NR	**NR**	0 - 0.4	2785	0.3 (0 - 0.6)
Lymphoid leukaemia	**35**	1.6	**1.8**	1.1-2.4	588	3.4 (2.3-4.5)
Myeloid leukaemia	**45**	2.0	**2.4**	1.7-3.2	482	4.3 (3.0-5.5)
Leukaemia, other	**<5**	NR	**NR**		-	
Brain	**75**	3.4	**4.6**	3.5-5.6	212	6.5 (5.0-8.0)
Oesophagus	**73**	3.3	**4.0**	3.1-5.0	213	6.6 (5.1-8.1)
Liver	**64**	2.9	**3.5**	2.6-4.4	243	5.9 (4.4-7.4)
Lymphoma	**60**	2.7	**3.0**	2.2-3.9	345	5.7 (4.3-7.2)
Lymphoma NOS	**<5**	NR	**NR**	0 - 0.2	6653	0.2 (0 - 0.5)
Hodgkin lymphoma	**NR**	NR	**NR**	0 - 0.6	3457	0.5 (0.1-0.9)
NHL	**53**	2.4	**2.6**	1.9-3.3	407	5 (3.7-6.4)
Kidney	**46**	2.1	**2.6**	1.8-3.4	301	4.2 (3.0-5.4)
Myeloma	**41**	1.8	**2.1**	1.4-2.7	442	3.9 (2.7-5.1)
Skin (NMSC inc. SCC/BCC)	**39**	1.7	**1.8**	1.2-2.4	892	3.9 (2.7-5.1)
Myelodysplastic diseases	**31**	1.4	**1.4**	0.9-2.0	861	3.2 (2.0-4.3)
Pharynx	**30**	1.3	**1.7**	1.1-2.3	507	2.7 (1.7-3.7)
Gallbladder / bile ducts	**28**	1.3	**1.4**	0.8-1.9	844	2.8 (1.7-3.8)
Lip, gum & mouth	**16**	0.7	**0.9**	0.5-1.4	1002	1.4 (0.7-2.0)
All cancer deaths	**2232**	100.0	**113.7**	109-119	9	213.1 (204-222)

Females

	Cases	%	ASR
Lung	**294**	18.0	**13.5**
Breast	**238**	14.6	**11.9**
Colorectal	**197**	12.1	**7.6**
Colon	**141**	8.7	**5.3**
Rectum	**56**	3.4	**2.3**
Unknown primary	**95**	5.8	**3.4**
Pancreas	**82**	5.0	**3.5**
Ovary	**81**	5.0	**4.0**
Lymphoma	**75**	4.6	**3.0**
Lymphoma NOS	**<5**	NR	**NR**
Hodgkin lymphoma	**<5**	NR	**NR**
NHL	**67**	4.1	**2.5**
Leukaemia	**66**	4.0	**2.7**
Leukaemia NOS	**<5**	NR	**NR**
Lymphoid leukaemia	**16**	1.0	**0.7**
Myeloid leukaemia	**48**	2.9	**2.0**
Leukaemia, other	**<5**	NR	**NR**
Brain	**52**	3.2	**2.8**
Melanoma (skin)	**46**	2.8	**2.0**
Stomach	**42**	2.6	**1.7**
Uterus	**39**	2.4	**1.8**
Myeloma	**34**	2.1	**1.4**
Bladder & urinary tract	**30**	1.8	**1.2**
Gallbladder / bile ducts	**29**	1.8	**1.1**
Myelodysplastic diseases	**28**	1.7	**1.0**
Liver	**25**	1.5	**1.2**
Cervix	**23**	1.4	**1.4**
Kidney	**23**	1.4	**1.0**
Oesophagus	**16**	1.0	**0.6**
Skin (NMSC inc. SCC/BCC)	**14**	0.9	**0.6**
All cancer deaths	**1630**	100.0	**72.2**

Delivering a **Healthy WA**

Western Australian Cancer Registry
Performance Activity and Quality Division

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