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Canstat: A digest of facts and figures on cancer

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Haematological malignancies

Neoplastic diseases of haematopoietic and lymphoid tissue

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**Of 27,636
new cancers
diagnosed
in 2008 in
Victoria, 10%
(2,801) were
haematological
malignancies**

Overview

Cancer is one of the leading causes of death in Victoria, accounting for 30% of all deaths in 2008. In the same year, nearly 28,000 Victorians were diagnosed with malignant neoplasms¹.

Neoplastic diseases of the haematopoietic and lymphoid tissue, also known as lympho-haematopoietic neoplasms (LHNs) or haematological malignancies are a heterogeneous group of cancers affecting the bone marrow and lymphoid tissue. This group of diseases is increasingly recognized for its potential to emerge as an important public health problem.

The Victorian Cancer Registry is notified by all hospitals and pathology laboratories in Victoria. Completeness of reporting for LHNs is being improved by active follow up for bone marrow aspirate/trephine biopsy (BMAT) reports and the advent of routine notification by the Victorian Cancer Cytogenetics Service. It is most common to receive (BMAT) results, often followed by flow cytometry and sometimes haematology for a case. Clinical diagnoses are less common though may be received for the elderly patient for who a more definitive diagnosis would not affect outcome.

Figure 1 shows Victorian 2008 incidence by major cancer types. LHNs are the fourth largest group of cancers in men, after the sex specific, digestive and respiratory cancers. In women, LHNs are the third largest group of cancers after sex specific and digestive cancers. Figure 2 shows the incidence and mortality from leading cancers in Victoria for 2008, where lymphoma and leukaemia, which make up the bulk of LHN, were ranked sixth and seventh in terms of incidence, and eighth and seventh in terms of mortality, respectively. Myelodysplastic syndromes (MDS) and chronic myeloproliferative disorders (CMD) and multiple myeloma (MM) also feature in

the top 20 cancers in Victoria. The impact of LHN on younger cohorts is significant, accounting for a quarter of all cancer deaths in those aged below 15 years.

Reclassification of LHN

The International Lymphoma Study Group proposed a new classification for the lymphoid neoplasms in 1994². Subsequently, the World Health Organization (WHO) embarked on an update to that classification, extending the principles of disease definition and consensus building to the myeloid and histiocytic neoplasms with the participation of more than 50 pathologists worldwide.

The new WHO classification³ of haematological malignancies stratifies neoplasms primarily according to their lineage: lymphoid neoplasms, myeloid neoplasms, mast cell disorders and histiocytic neoplasms. Within each category, distinct diseases are defined according to a combination of morphology, immunophenotype, genetic features and clinical syndromes, with the overall objective of defining disease entities that could be recognized by pathologists and that have clinical relevance.

The Australian Association of Cancer Registries (AACR), in consultation with the Australian Blood Cancer Registry (ABCR), has adopted the revised WHO classification, with some small modifications, for reporting of neoplastic diseases of the haematopoietic and lymphoid tissue. Appendix 1 shows the mapping of ICDO-3⁴ morphology codes, in which all tumours are coded by the Victorian Cancer Registry (VCR) into this new classification, which is referred to henceforth as the AACR classification⁵.

Table 1 (page 5) shows the incidence of LHN in Victoria according to the newly adopted classification. Lymphoid

Figure 1: New cancers in Victoria 2008 by major types and sex.

Figure shows all new malignant tumours diagnosed in Victorians in 2008 grouped by ICD10⁸ sections and sex.

Bars show each cancer as a percentage of all cancers in each sex; numbers are total incidence for males and females combined.

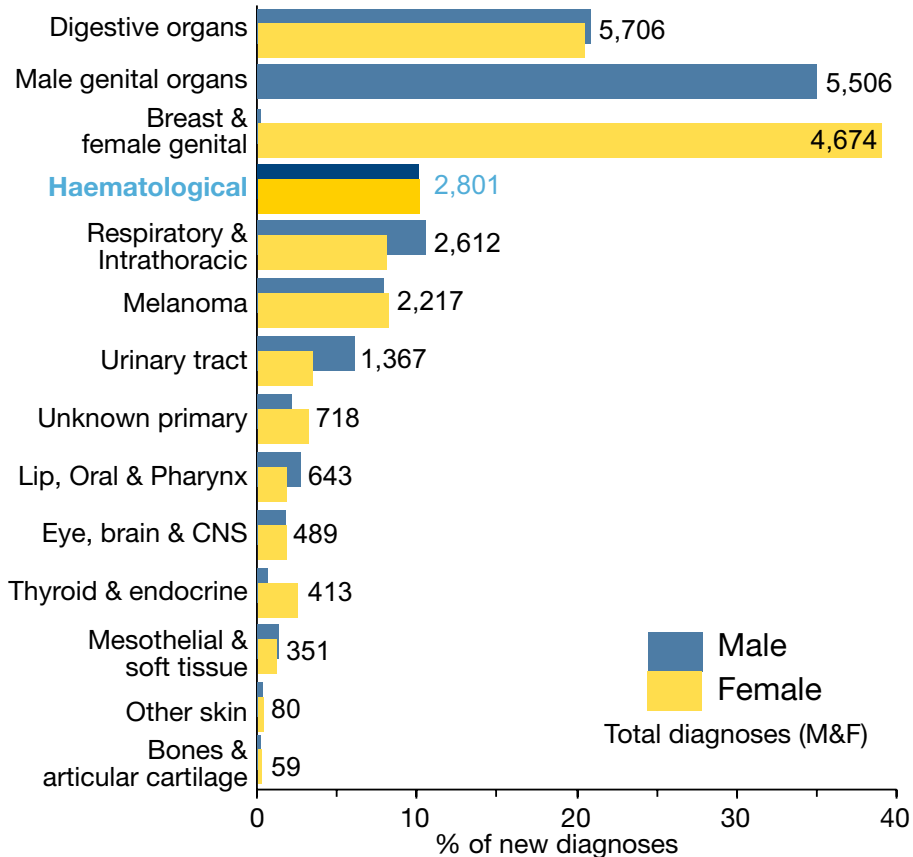
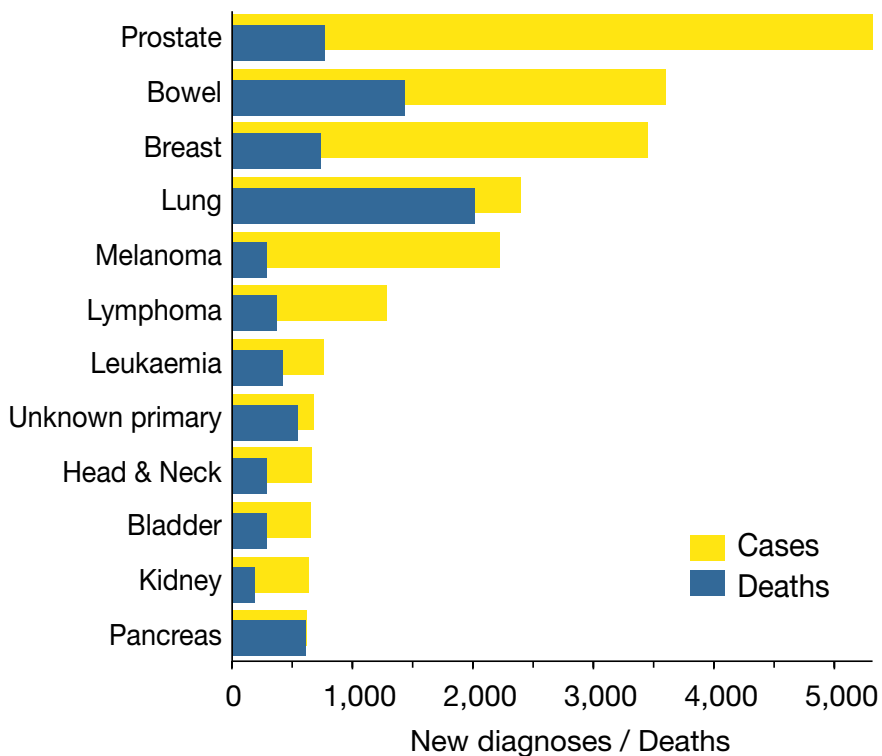


Figure 2 Leading sites of cancer in Victoria 2008

Figure shows the new cases and deaths for common sites of new cancer in Victorians in 2008.

Bars show total cases and deaths for males and females combined.



neoplasms account for nearly three-quarters of all haematological malignancies diagnosed during 1982-2008 with mature B-cell neoplasms being the most common sub-group. Chronic lymphocytic leukaemia (CLL)/small lymphocytic lymphoma, diffuse large B-cell lymphoma (DLBCL), follicular lymphoma (FL) and plasma cell disorders are all common, clinically distinct entities, with Hodgkin lymphoma (HD), acute lymphoblastic leukaemia (ALL) and mature T- and NK-cell neoplasms being less common variants of lymphoid neoplasms.

Acute myeloid leukaemia (AML) is the most common of the myeloid neoplasms with other common variants including chronic myeloid leukaemia (CML), other CMD, MDS and myelodysplastic/myeloproliferative diseases. The rarer histiocytic neoplasms and mast cell disorders are classified under other lymphoid/haematopoietic neoplasms in Table 1.

Incidence vs. prevalence

Cancer incidence measures the occurrence of new cancers in a defined period and should not be confused with prevalence, which measures the total number of cases of the disease in the population (regardless of when they were diagnosed). Thus, incidence conveys information about the risk of contracting the disease, whereas prevalence indicates how widespread the disease is.

It is important to realise that cancer incidence statistics, as reported by cancer registries worldwide, do not count every occurrence of a new primary cancer or neoplasm in a person. Where an individual has been diagnosed with more than one primary neoplasm, the multiple primary rules of the International Agency for Research on Cancer and the International Association of Cancer Registries are applied⁶. According to the rules, multiple primary neoplasms of the same 'morphological type' are counted only once in an individual. For example, all myeloid neoplasms are grouped as a single type and

therefore an individual who has a myelodysplastic syndrome and subsequently develops acute myeloid leukaemia will only have the former counted in incidence figures.

It is not uncommon, with the haematological malignancies, for a chronic condition to transform or progress to a new acute neoplasm, which results in apparent under-estimation of the true occurrence of some cancers, in particular AML. With solid tumours, it is less common for an individual to develop a second tumour of the same morphological type in the same organ and the difference between incidence and true prevalence is much smaller. Notable exceptions are in cancers of the breast, large bowel and melanoma in which multiple primary tumours are not uncommon and for these tumours too there is a significant difference between incidence and true prevalence.

Prevalence figures are not routinely published and the reader should be aware that reported incidence not only under-estimates the occurrence of some cancers but also the workload of the pathologists and the resources consumed in their management. In Appendix 2 we have reported counts for all LHNs diagnosed in Victoria in 2008 including those that would not be included in incidence figures. These counts give a better idea of the true burden of these conditions in Victoria but still only relate to total diagnoses in a given period and do not reflect the total number of Victorians living with a condition at any given time.

Most striking in this table are the figures for AML with more than a quarter of diagnoses not being counted in incidence (the proportion increasing with age). Also notable are the 10% of diffuse large B-cell lymphomas not counted in incidence and significant numbers in less specific categories, including death certificate only diagnoses.

Table 1: Incidence of haematological malignancies in Victoria 1982-2008 (total) and 2008 according to the AACR classification⁵.

| Subtype according to AACR classification | 1982-2008 | | 2008 | |
|--|---------------|-------------|--------------|-------------|
| | Cases | % | Cases | % |
| Lymphoid neoplasms | 36,333 | 69.2 | 2,018 | 72.0 |
| Hodgkin lymphoma | 3,063 | 5.8 | 153 | 5.5 |
| Mature B-cell neoplasms | 26,199 | 49.9 | 1,509 | 53.9 |
| <i>Chronic lymphocytic leukaemia/ Small lymphocytic lymphoma</i> | 5,510 | 10.5 | 241 | 8.6 |
| <i>Diffuse large B-cell lymphoma</i> | 7,146 | 13.6 | 388 | 13.9 |
| <i>Follicular lymphoma</i> | 4,333 | 8.3 | 258 | 9.2 |
| <i>Plasma cell disorders</i> | 6,040 | 11.5 | 383 | 13.7 |
| <i>Other mature B-cell neoplasms</i> | 3,170 | 6.0 | 239 | 8.5 |
| Mature T- and NK-cell neoplasms | 1310 | 2.5 | 97 | 3.5 |
| Acute lymphoblastic leukaemia | 2,048 | 3.9 | 82 | 2.9 |
| Non-Hodgkin lymphoma, NOS | 2,474 | 4.7 | 92 | 3.3 |
| Lymphoid neoplasms, NOS | 1,239 | 2.4 | 85 | 3.0 |
| Myeloid neoplasms | 12,680 | 24.2 | 683 | 24.4 |
| Acute myeloid leukaemia | 4,038 | 7.7 | 228 | 8.1 |
| Chronic myeloid leukaemia | 1,571 | 3.0 | 63 | 2.2 |
| Other chronic myeloproliferative diseases | 2,679 | 5.1 | 108 | 3.9 |
| Myelodysplastic syndromes | 3,296 | 6.3 | 200 | 7.1 |
| Myelodysplastic/myeloproliferative diseases | 957 | 1.8 | 79 | 2.8 |
| Myeloid neoplasms, NOS | 139 | 0.3 | 5 | 0.2 |
| Lymphoid / myeloid neoplasms, NOS | 343 | 0.7 | 6 | 0.2 |
| Other lymphoid / haematopoietic neoplasms | 150 | 0.3 | 11 | 0.4 |
| No histological diagnosis (including death certificate only) | 2,994 | 5.7 | 83 | 3.0 |
| All haematological malignancies | 52,500 | 100 | 2,801 | 100 |

Incidence trends

Table 2 shows the more than two-fold increase in diagnoses of lymphoid and myeloid neoplasms between 1988 and 2008. Whilst rising incidence rates have been observed in many countries, these figures also reflect improvements in reporting and classification of LHN, especially during the earlier years.

The incidence rates (age-standardised per 100,000) of all malignant neoplasms in Victorian males and females have risen from 302.1 and 242.7 men and women respectively in 1988 to 377.5 and 269.6 in 2008 with an overall average annual increase of 0.6%.

During the same period, both lymphoid and myeloid neoplasms

have become increasingly common with annual rates of increase in the past 20 years of 1.1% and 3.2% respectively.

Figure 3 shows the incidence trends since 1982 for the common lymphoid neoplasms. Mature B-cell (especially diffuse large B-cell and follicular lymphomas and plasma cell disorders) and T- & NK-cell lymphomas have shown steady increases with Hodgkin lymphoma and acute lymphoblastic leukaemia rates remaining more stable.

Figure 4 shows increasing rates for trends for acute and a slight decline in chronic myeloid leukaemias since 1982.

Table 2: Lymphoid and myeloid neoplasms in Victoria – the size of the problem over three decades.

Incidence numbers and rates in 1988, 1998 and 2008 by sex for all lymphoid and myeloid neoplasms.

Notes:

Rate per 100,000 persons is age-standardised to the World Standard Population (Segi)

Median age is median age at diagnosis/death in whole years

Annual change is the average annual rate of change (%) in age-standardised rates over the periods 1988-2008 and 1998-2008 calculated using a geometric formula from the fitted linear line of best fit through observed rates.

Lifetime risk is the cumulative risk of diagnosis from age 0 to 75 years

| | Year of diagnosis | | |
|-------------------------------|-------------------|----------|----------|
| | 1988 | 1998 | 2008 |
| All lymphoid neoplasms | | | |
| New cases | | | |
| Males | 576 | 800 | 1,157 |
| Females | 428 | 693 | 861 |
| Persons | 1,004 | 1,493 | 2,018 |
| Rate | | | |
| Males | 23.2 | 26.6 | 29.8 |
| Females | 15.0 | 18.6 | 19.8 |
| Persons | 18.8 | 22.5 | 24.6 |
| Median age | 63 | 67 | 67 |
| Risk to age 75 years | 1 in 52 | 1 in 44 | 1 in 39 |
| Annual change (to 2008) | +1.1% | +0.9% | - |
| All myeloid neoplasms | | | |
| New cases | | | |
| Males | 120 | 306 | 392 |
| Females | 95 | 256 | 291 |
| Persons | 215 | 562 | 683 |
| Rate | | | |
| Males | 4.7 | 9.1 | 9.0 |
| Females | 3.2 | 5.8 | 5.4 |
| Persons | 3.8 | 7.3 | 7.1 |
| Median age | 66 | 73 | 74 |
| Risk to age 75 years | 1 in 240 | 1 in 138 | 1 in 143 |
| Annual change (to 2008) | +3.2% | +3.8% | - |

Figure 3: Incidence trends in lymphoid neoplasms in Victoria.

Incidence trends for the major subtypes of lymphoid neoplasm in Victoria 1982–2008. The graph shows age-standardised rates (Segi World Standard Population) per 100,000 Victorian men and women.

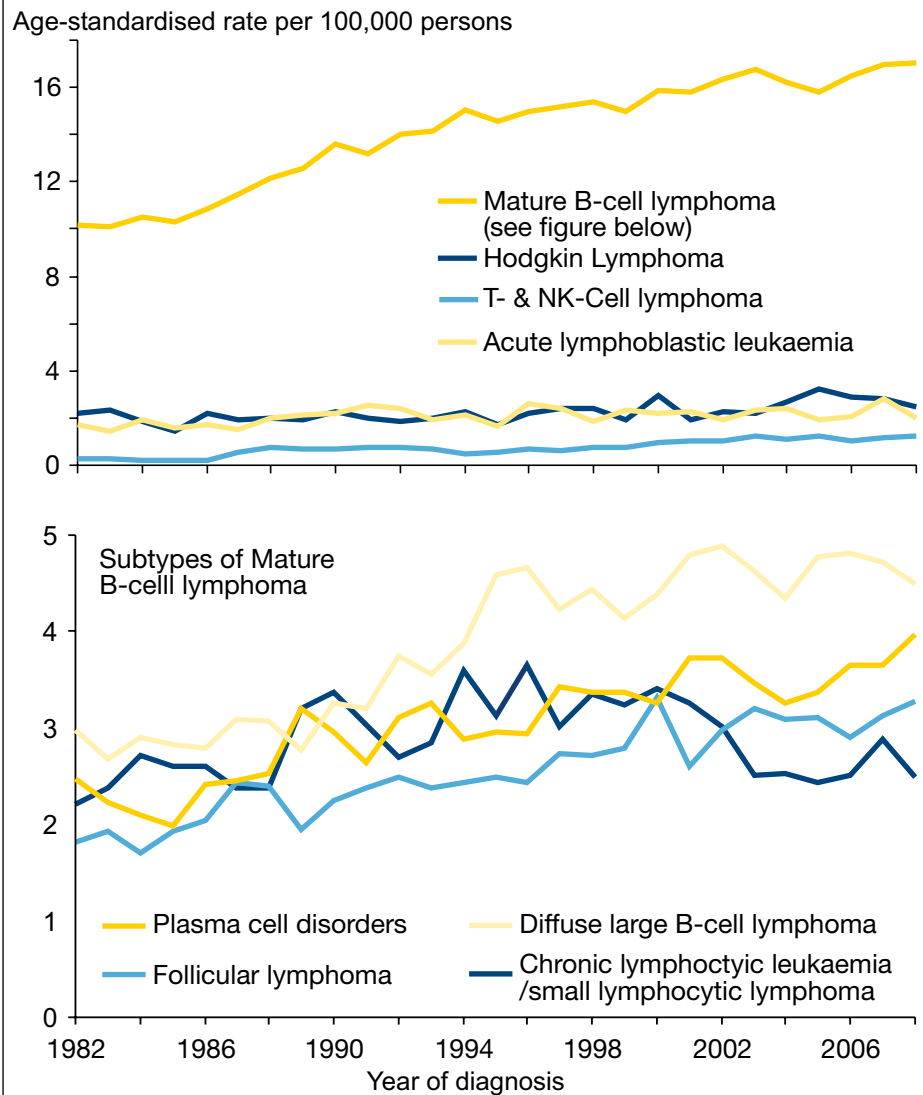


Figure 4: Incidence trends in myeloid neoplasms in Victoria.

Incidence trends for the major subtypes of myeloid neoplasms in Victoria 1982–2008. The graph shows age-standardised rates (Segi World Standard Population) per 100,000 Victorian men and women.

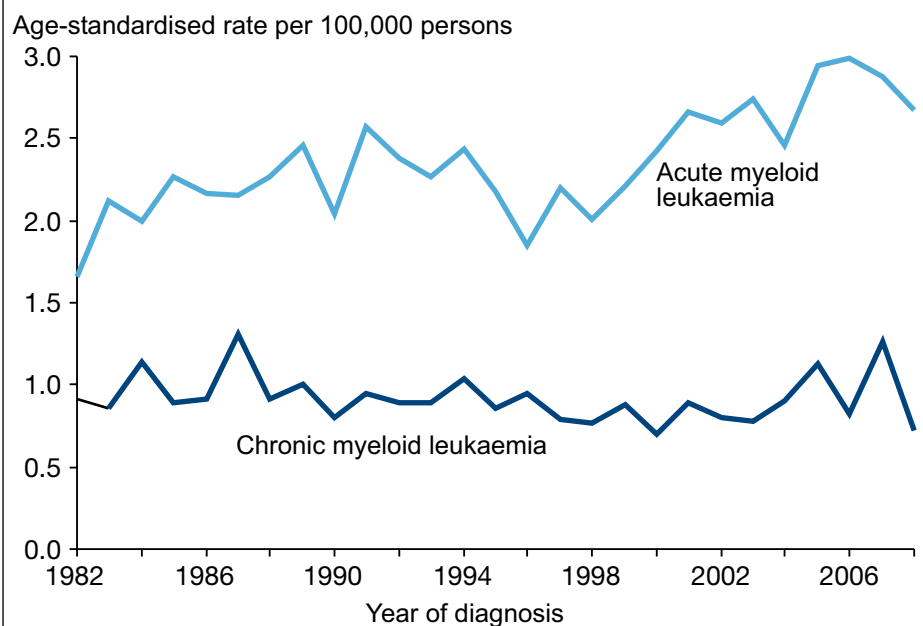


Figure 5 shows the age-specific incidence of lymphoid and myeloid neoplasms in Victoria.

For lymphoid neoplasms, there is a small peak in very young children, another between the ages of 15 and 35 years and then rapidly increasing incidence in persons aged over 35, with this increase being much steeper in men than in women. These peaks at different age groups reflect the incidence patterns of the major sub-types of lymphoid neoplasm as shown in Figure 6.

Acute lymphoblastic leukaemia is predominantly diagnosed in children below the age of 5 years, and is relatively uncommon in older age groups. Hodgkin lymphoma has twin peaks in incidence, one around 20-24 years and another around 75-79 years. Mature B-cell neoplasms, which make up the bulk of lymphoid malignancies, become commoner with increasing age, especially from 35 years, and are rare among

the young. The overall patterns for both males and females are similar, with a markedly higher incidence in males in almost all age groups.

Myeloid neoplasms show low levels of incidence before the age of 55 years that increase rapidly thereafter, more steeply in men than in women. There are no major differences in the age-specific incidence patterns between the different sub-types of myeloid neoplasms. In the case of acute myeloid leukaemia, the peak incidence is seen in persons aged 75-79 years.

The increasing trend in incidence, described earlier for both lymphoid and myeloid neoplasms from 1988 to 2008 (Table 2), is markedly more pronounced for older age groups. The trends in incidence by age group for myeloid and lymphoid neoplasms are shown in Figure 7.

Figure 5: Age-specific incidence of lymphoid and myeloid neoplasms in Victoria.

Incidence rates by age group and sex for all lymphoid and myeloid neoplasms in Victoria 2005-2008.

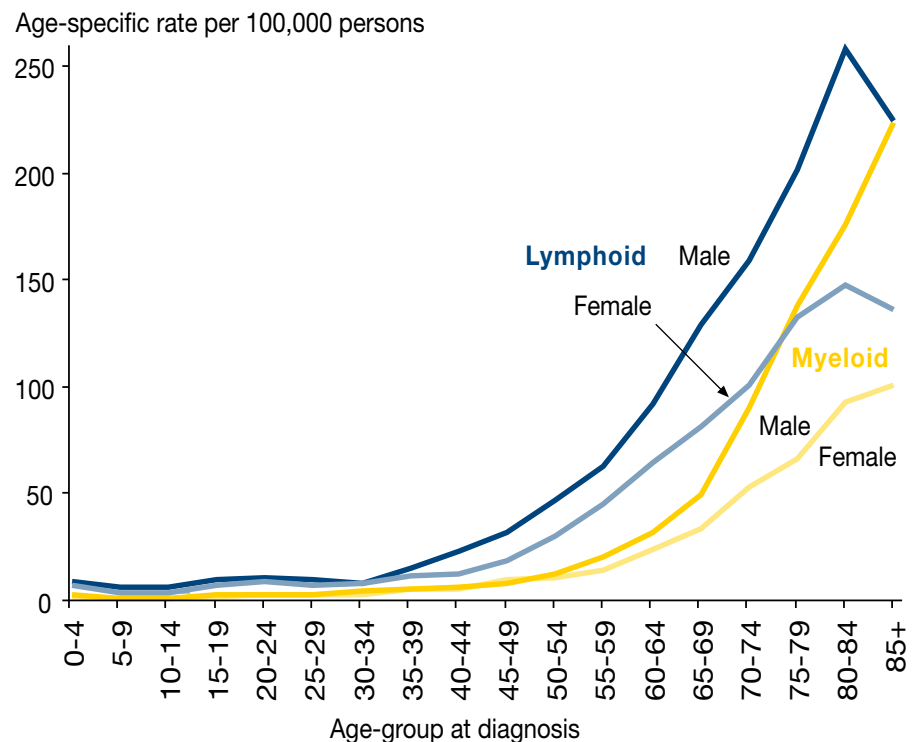


Figure 6: Age-specific incidence of types of lymphoid neoplasms in Victoria.

Incidence rates by age group the major subgroups of lymphoid

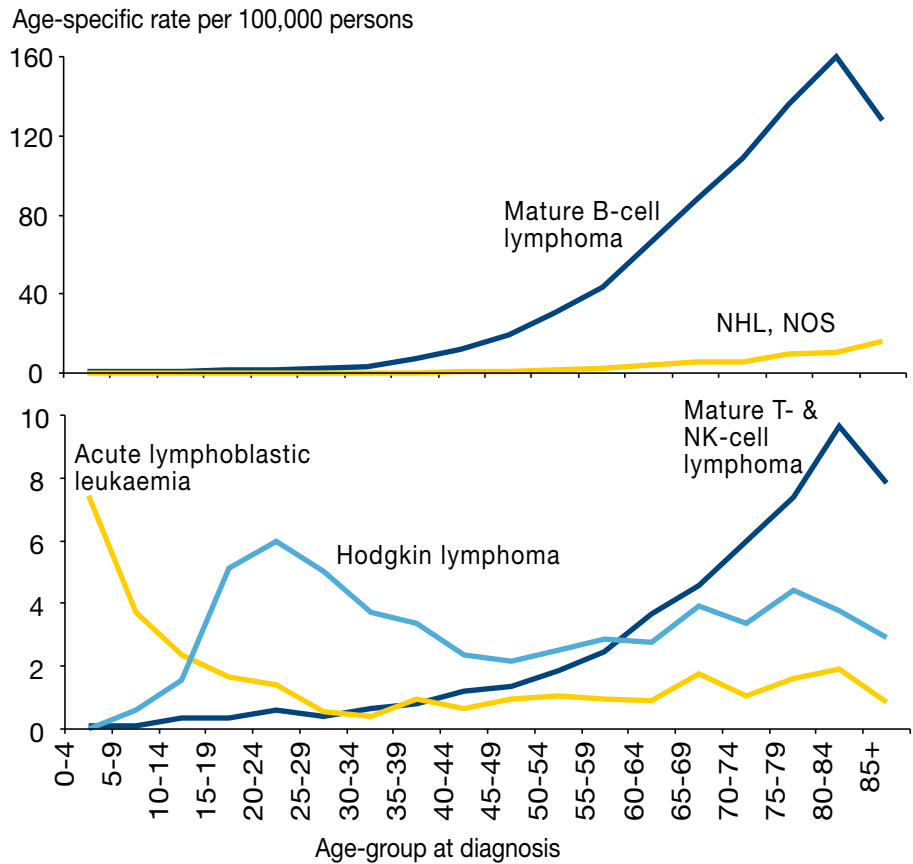
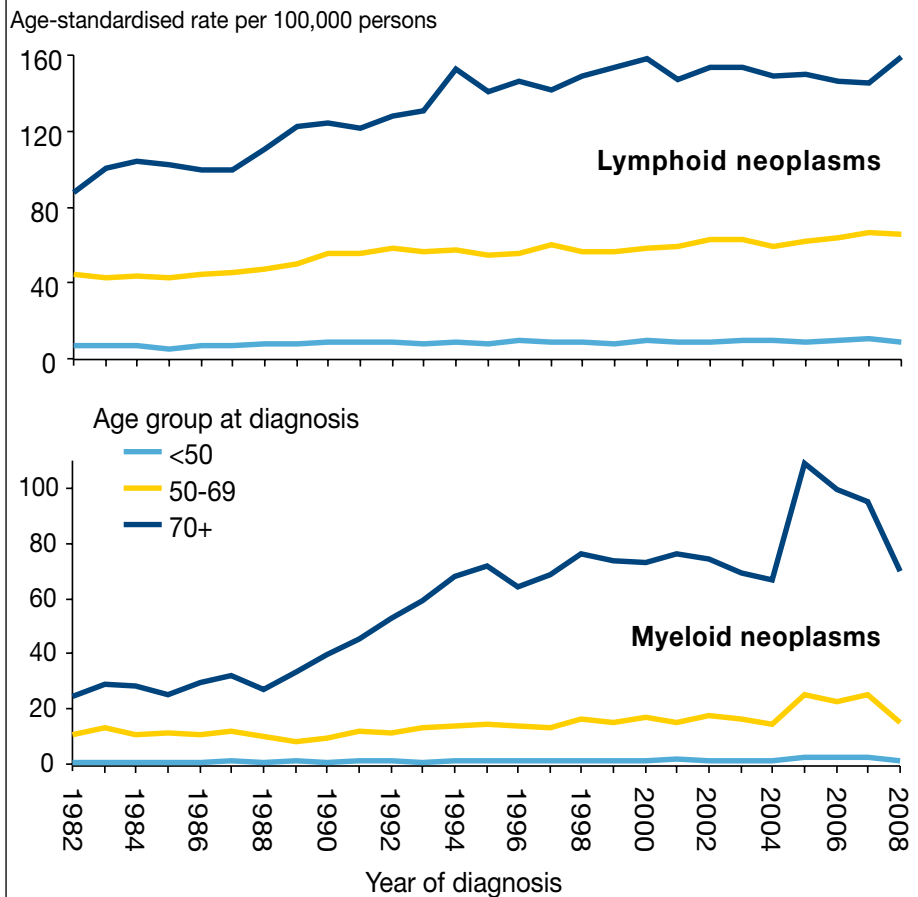


Figure 6: Trends in incidence of lymphoid and myeloid neoplasms in Victoria for different age groups.

Incidence rates by sex and age groups (under 50, 50-69 & over 70 years) for Victoria 1982-2008.

The graph shows age-standardised rates (Segi World Standard Population) per 100,000 Victorian men and women



Mortality

National mortality data are coded by the Australian Bureau of Statistics (ABS) using information recorded by medical practitioners on death certificates, as required by State and Territory Registrars of Births, Deaths and Marriages.

Figures 6 & 7 show trends in mortality for major types of LHN and four common types of leukaemia according to the coded underlying cause of death from the ABS⁷. Since 1982, mortality rates for both NHL and Hodgkin lymphoma have steadily decreased in both sexes. Multiple myeloma mortality has remained stable over this period whilst leukaemia showed increasing mortality until the mid-1990s followed by a fairly steep decrease. The reasons for this pattern for leukaemia are not clear but might, at least in part, be due to improved reporting and classification of disease.

For the major leukaemia types, rates have fallen steadily for acute lymphoblastic since 1982 and for chronic myeloid since the late 1990s. A lesser decrease is seen in chronic lymphocytic and a stabilising of previously increasing rates of chronic myeloid from the late 1990s.

Mortality coding at VCR

Since 2007 the VCR has coded its own underlying cause of death, instead of using the ABS coded mortality. The reasons for this change included consistency with other Australian cancer registries, who all code and report their own mortality, and improved data quality and specificity. The registry has additional information, not available to the ABS, regarding each person's diagnosis/diagnoses, including pathology/haematology reports and details of recent hospital admissions for recurrent or metastatic disease. This information may assist in deciding whether cancer was the underlying cause of death and in determining the most

accurate cancer code. For LHN, death certificates (DC) rarely contain the detailed morphology information required for grouping to the AACR classification - by matching the cause of death to existing registry records we can often obtain a more precise code.

Example 1: DC states underlying cause of death "Lymphoma - cutaneous - months". ABS code is C85.9 (NHL, not otherwise specified) - VCR has recent haematology and cytogenetics reports indicating "Primary cutaneous CD30+ T-cell lymphoproliferative disorder" and codes to C84.5.

Example 2: DC states death due to "B-cell lymphoma - 12 years". ABS code is C85.1 (B-cell NHL, not otherwise specified) - VCR has haematology reports, dating back 12 years, indicating "Large cell follicular lymphoma" and codes to C82.2.

In a sample of 153 records relating to LHN deaths in 2006 for which both ABS and VCR coded cause of death were available, 48% of all deaths and 88% of NHL deaths were coded by the ABS to a fairly nonspecific ICD10 code. The additional information held by the VCR reduced these figures to <20% and 14% thereby allowing more detailed analysis of mortality.

Figure 8 shows age-specific mortality rates in 2007–8 for selected AACR categories using VCR coded mortality. It can be seen that the different types of malignancy have very different age-distributions and, where the sexes have been separated, mortality rates are consistently higher in males than females particularly in older age groups. Not surprisingly cases notified to the VCR only by death certificate (i.e. without any hospital admission or histology/haematology) tend to be elderly.

Figure 6: Mortality trends for haematological malignancies

Graph shows the trends in mortality rates (age-standardised per 100,000 persons) for Victoria 1982-2007 for major groups of haematological malignancies by ICD-10 categories^{7, 8}.

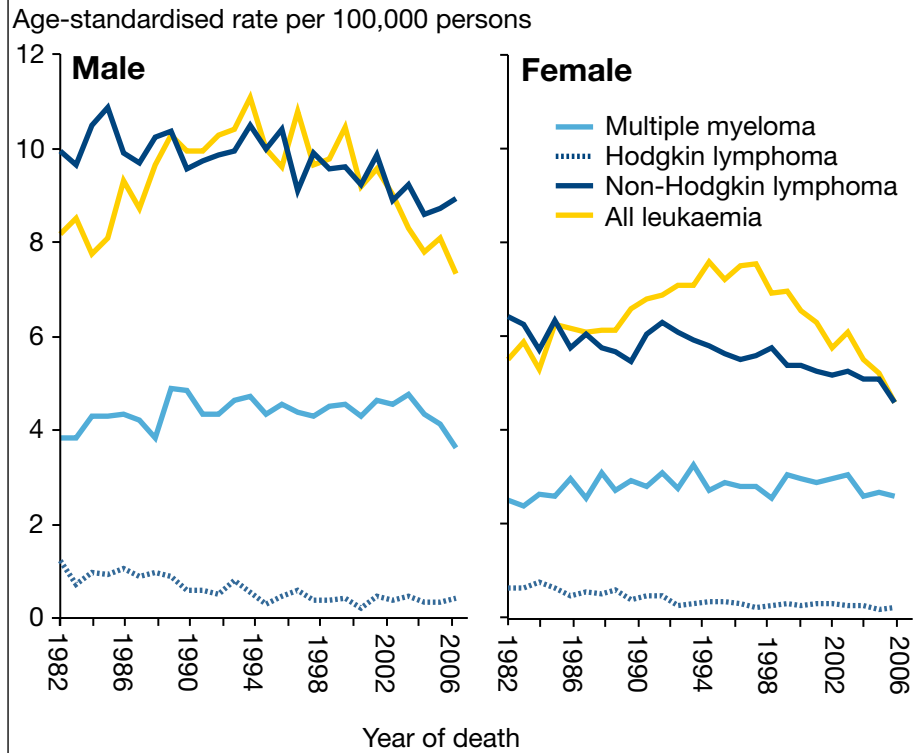


Figure 7: Mortality trends for sub-types of leukaemia.

Graph shows the trends in mortality rates (age-standardised per 100,000 persons) for Victoria 1982-2007 for the common leukaemia sub-types by ICD-10 categories^{7, 8}.

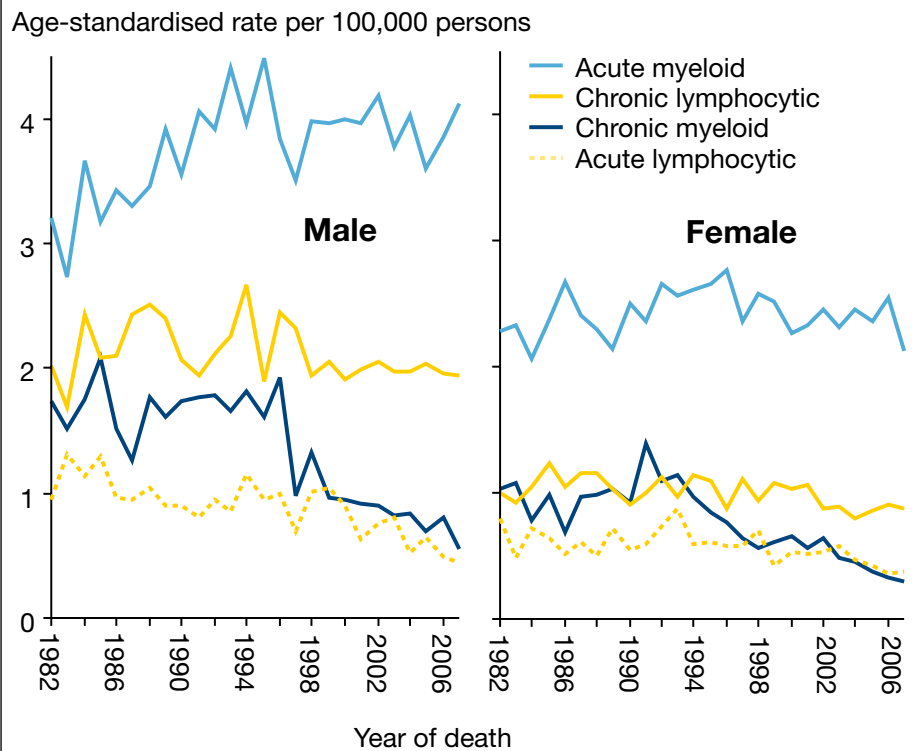


Figure 8: Age-specific mortality rates for in Victorian men and women in 2007-2008 by AACR categories.

The figure shows the age-specific mortality rates for men and women in 2007-2008, the first two years in which VCR have coded cause of death using information from the death certificate augmented by what is known about the tumour from the Victorian Cancer Registry.

Age-specific rate per 100,000 persons

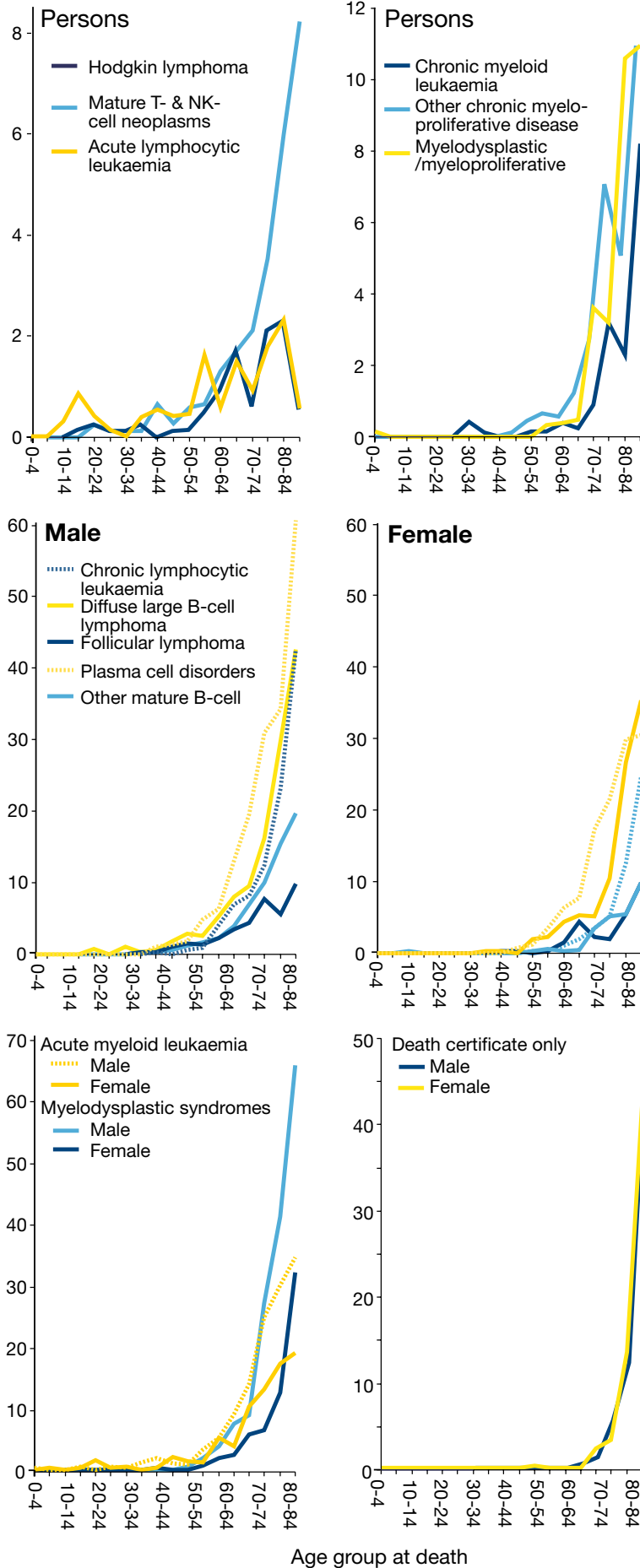


Table 3: Mortality from haematological malignancies in Victoria 2007-2008 according to the AACR classification and sex.

Cause of death coded by VCR using information from the death certificate augmented by what is known about the tumour from the Victorian Cancer Registry.

Subtype according to AACR classification

| | Male | | | Female | | |
|--|--------------|---------------|-------------|------------|---------------|------------|
| | Deaths | % | Rate | Deaths | % | Rate |
| Lymphoid neoplasms | 765 | 63.8% | 8.4 | 430 | 47.1% | 4.3 |
| Hodgkin lymphoma | 24 | 2.0% | 0.3 | 14 | 1.5% | 0.2 |
| Mature B-cell neoplasms | 606 | 50.5% | 6.5 | 480 | 52.6% | 3.8 |
| <i>Chronic lymphocytic leukaemia/ small lymphocytic lymphoma</i> | 107 | 8.9% | 1.1 | 69 | 7.6% | 0.4 |
| <i>Diffuse large B-cell lymphoma</i> | 154 | 12.8% | 1.7 | 141 | 15.5% | 1.1 |
| <i>Follicular lymphoma</i> | 56 | 4.7% | 0.7 | 42 | 4.6% | 0.4 |
| <i>Plasma cell disorders</i> | 212 | 17.7% | 2.3 | 189 | 20.7% | 1.6 |
| <i>Other mature B-cell neoplasms</i> | 77 | 6.4% | 0.8 | 39 | 4.3% | 0.3 |
| Mature T- and NK-cell neoplasms | 46 | 3.8% | 0.5 | 33 | 3.6% | 0.3 |
| Acute lymphoblastic leukaemia | 36 | 3.0% | 0.6 | 22 | 2.4% | 0.3 |
| Non-Hodgkin lymphoma, NOS | 37 | 3.1% | 0.3 | 29 | 3.2% | 0.2 |
| Lymphoid neoplasms, NOS | 16 | 1.3% | 0.1 | 17 | 1.9% | 0.1 |
| Myeloid neoplasms | 595 | 49.6% | 4.8 | 313 | 34.3% | 2.6 |
| Acute myeloid leukaemia | 169 | 14.1% | 1.9 | 134 | 14.7% | 1.3 |
| Chronic myeloid leukaemia | 21 | 1.8% | 0.2 | 20 | 2.2% | 0.2 |
| Other chronic myeloproliferative diseases | 36 | 3.0% | 0.4 | 40 | 4.4% | 0.3 |
| Myelodysplastic syndromes | 159 | 13.3% | 1.5 | 88 | 9.6% | 0.6 |
| Myelodysplastic/myeloproliferative diseases | 43 | 3.6% | 0.4 | 28 | 3.1% | 0.2 |
| Myeloid neoplasms, NOS | 2 | 0.2% | 0.0 | 3 | 0.3% | 0.0 |
| Lymphoid / myeloid neoplasms, NOS | 3 | 0.3% | 0.0 | 3 | 0.3% | 0.0 |
| Other lymphoid / haematopoietic neoplasms | 2 | 0.2% | 0.0 | 1 | 0.1% | 0.0 |
| No histological diagnosis (including death certificate only) | 48 | 4.0% | 0.4 | 78 | 8.6% | 0.4 |
| All haematological malignancies | 1,200 | 100.0% | 12.8 | 912 | 100.0% | 7.4 |

Deaths = deaths in two years 2007 & 2008

% = percentage of total haematological malignancies

Rate = annual age-standardised mortality rate per 100,000 Victorians (standardised to World Standard Population)

52% of Victorians with LHN in 2004 survived at least 5 years from diagnosis

Survival

Fifty two percent of Victorians with haematological malignancies in 2004 were expected to survive their cancer for at least five years⁹. Although the survival rates did not differ significantly for males and females, the five-year relative survival dropped from 86% for patients in the first three decades of their lives to 24% for those aged over eighty years.

Relative survival at one-, five- and ten-years after diagnosis is shown in Table 4 for the major subtypes of LHN. Survival was observed to vary markedly among different subtypes with 58% five-year survival for patients with lymphoid neoplasms, compared to only 35% of those with myeloid. It has been suggested that possible under-ascertainment for indolent CLL (without BMAT) may affect reported survival for this condition.

Lymphoid neoplasms

Among lymphoid neoplasms, the survival for patients with Hodgkin lymphoma (86%) was comparatively high, although the difference by age was significant (96% and 57% respectively in patients aged less or greater than fifty years at diagnosis). The five-year survival rates for subtypes of mature B-cell neoplasms varied from 81% for follicular lymphoma to 31% for plasma cell disorders. Survival with acute lymphoblastic leukaemia dropped markedly with increasing age at diagnosis from over 85% for patients aged under fifteen years to less than 25% for patients aged over thirty years.

Figure 9 shows survival for all lymphoid neoplasms by age, sex and time period and Figure 10 for selected subtypes for selected years from 1990. Overall, the five-year relative survival for lymphoid neoplasms declined markedly with advancing age (89% for children aged 0-14 years, 35% for those aged over 75 years; $p < 0.001$), improved over the fifteen years from 1990 (49% in 1990, 58% in

2004; $p < 0.001$) and did not vary by sex.

Of the subtypes of lymphoid neoplasms, a statistically significant improvement in survival was evident only for mature B-cell neoplasms ($p < 0.001$). Higher five-year survival for younger patients, declining with advancing age, was seen for all three subtypes (96% for aged under fifty and 57% for those aged over fifty years, $p < 0.001$ for Hodgkin lymphoma; 82% for 0-44 years, 36% for over 75 years, $p < 0.001$ for mature B-cell neoplasms; 85% for those aged under five years, 23% for those aged over 30 years, $p < 0.001$ for ALL).

Recent improvements in survival for Victorian patients diagnosed with lymphoid neoplasms are similar to those reported from Italy using the WHO entities¹⁰, confirming the assertion that lymphoma prognosis has improved^{11, 12}. Possible explanations for this improvement include the use of new drugs, more efficient use of existing drugs and more accurate diagnostic tools¹⁰. However, we cannot exclude improvements in ascertainment of indolent lymphoid disease as a consequence of classification and improvements in notification to the registry.

The poor prognosis seen in older Victorians with lymphoid neoplasms is consistent with previous studies¹³⁻¹⁶. Declining immune responses with increasing age, the inability to tolerate more effective and more toxic treatment regimes, especially due to co-morbidities, and the presence of more aggressive morphologies have been attributed to the poorer prognoses seen in the elderly. We did not observe better survival rates for females in contrast to previous reports^{12,13}.

Table 4: Survival for Victorian men and women with haematological malignancies in 2004⁹.

One-, five- and ten-year relative survival (% survival with 95% confidence interval) by age group and AACR groups

Subtype according to AACR classification

| | Relative survival (%) with 95% confidence interval at | | |
|--|---|-------------------|-------------------|
| | 1-year | 5-years | 10-years |
| Lymphoid neoplasms | 79 (79-80) | 58 (57-60) | 46 (45-47) |
| Hodgkin lymphoma | 94 (92-96) | 86 (83-88) | 82 (78-85) |
| Mature B-cell neoplasms | 79 (78-80) | 56 (55-58) | 41 (40-43) |
| <i>Chronic lymphocytic leukaemia/ small lymphocytic lymphoma</i> | 86 (83-88) | 67 (64-70) | 45 (41-49) |
| <i>Diffuse large B-cell lymphoma</i> | 70 (68-72) | 53 (50-56) | 46 (43-48) |
| <i>Follicular lymphoma</i> | 96 (94-97) | 81 (78-84) | 64 (60-68) |
| <i>Plasma cell disorders</i> | 72 (70-75) | 31 (29-34) | 14 (12-17) |
| <i>Other mature B-cell neoplasms</i> | 83 (80-85) | 63 (59-67) | 51 (46-56) |
| Mature T- and NK-cell neoplasms | 61 (53-67) | n/c | n/c |
| Acute lymphoblastic leukaemia | 83 (79-86) | 64 (60-68) | 60 (56-65) |
| Myeloid neoplasms | 62 (60-64) | 35 (33-36) | 25 (23-27) |
| Acute myeloid leukaemia | 37 (35-40) | 20 (18-23) | 19 (17-22) |
| Chronic myeloid leukaemia | 86 (82-90) | 57 (50-63) | 43 (36-50) |
| Other chronic myeloproliferative diseases | 84 (80-87) | 61 (56-65) | 47 (42-53) |
| Myelodysplastic syndromes | 66 (63-69) | 27 (24-31) | n/c |
| Myelodysplastic/myeloproliferative diseases | 57 (51-62) | n/c | n/c |

Non-Hodgkin lymphoma NOS, Lymphoid neoplasms NOS, Myeloid neoplasms NOS, Lymphoid/myeloid neoplasms NOS, Other lymphoid/hematopoietic neoplasms and those without a histological diagnosis (including death certificate only) not included.

n/c indicates not calculated (due to insufficient number of patients in the analysis.)

Evidence of high, stable survival at five and ten years reinforces what is already known about Hodgkin lymphoma. In the case of plasma cell disorders, poor survival at five years probably indicates the need for better treatment regimes. Poor prognosis in patients diagnosed with acute lymphoblastic leukaemia aged over fifteen years highlights a significant issue that needs to be addressed by haematologists and oncologists¹⁷.

Myeloid neoplasms

Survival with acute myeloid leukaemia was extremely low (20% at five years), with prognosis for men and for those aged over fifty-five years at diagnosis being remarkably poor. Chronic myeloid leukaemia and other chronic myeloproliferative disorders had relatively better survival, but the survival rates dropped significantly in older age groups in all myeloid neoplasms.

Figure 9 shows survival for all myeloid neoplasms by age, sex and time period and Figure 10 for selected subtypes for selected years from 1990. For all myeloid neoplasms, the 5-year survival improved from 20% in 1990 to 34% in 2004 ($p < 0.001$). Five-year survival was better for females (39%) than males (31%, $p < 0.01$) and for younger patients (73% for those aged under 45 years) than older patients (19% for those aged over 75 years, $p < 0.001$). The gains in survival over the fifteen years from 1990 were evident for acute myeloid leukaemia ($p < 0.001$), chronic myeloid leukaemia ($p < 0.001$) and myelodysplastic syndromes ($p < 0.001$).

Females had better five-year survival than males for all subtypes of myeloid neoplasms ($p < 0.05$) except chronic myeloid leukaemia ($p = 0.32$) though it is probably too soon to see the effects of Imatinib (Glivec) therapy. Survival fell substantially to 6% after one year for those aged over 75 years for acute myeloid

leukaemia, while the decline with time since diagnosis was less dramatic for progressively younger patients. All subtypes of myeloid neoplasms showed a decline in survival with advancing age ($p < 0.001$).

Except for 'other chronic myeloproliferative disorders', the survival of myeloid patients has improved in recent times, possibly due to the same reasons discussed for lymphoid neoplasms. Furthermore, the elderly have shown markedly poor survival possibly due to their inability to tolerate more effective and generally more toxic treatment regimens. It is difficult to compare our rates with findings from other parts of the world due to a lack of studies incorporating the range of WHO myeloid entities. In the first such study using the latest SEER data on myelodysplastic syndromes¹⁷, the three-year relative survival was 35% (compared with 27% at five years in Victoria) with males and older patients shown to have worse survival as observed in Victoria. The underlying reasons for poorer prognosis for males with most myeloid subtypes needs to be investigated more thoroughly in future studies.

When comparing survival between different regions, it is important to consider that differences in type of treatment and disease stage at diagnosis can affect survival for at least some LHN subtypes in addition to potential differences in morphologic case mix. Unfortunately, neither treatment details nor the stage of disease were available for this analysis. It is also important to address the accuracy of the survival measure as that could potentially affect the robustness of findings. We used relative survival to assess prognosis, which does not use the exact cause of death in the analysis, thus eliminating errors associated with it.

Figure 9: Survival for Victorians with all lymphoid and all myeloid neoplasms by age group, sex and time period

Lymphoid neoplasms



Myeloid neoplasms

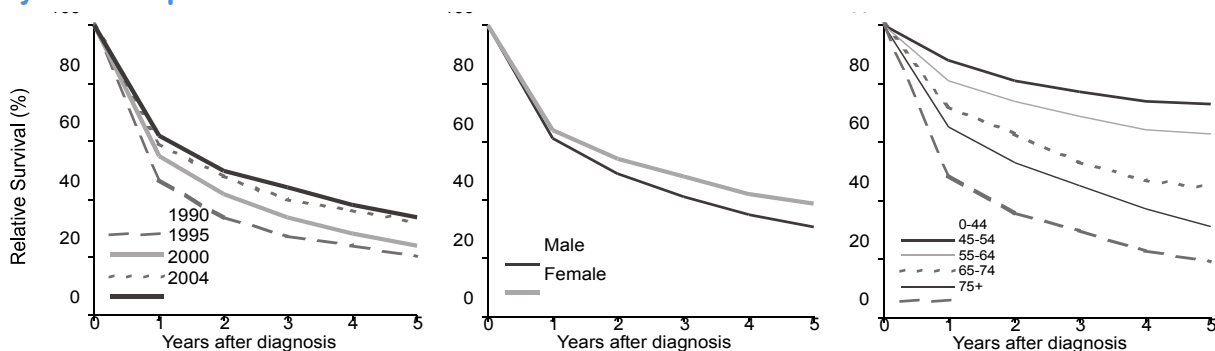
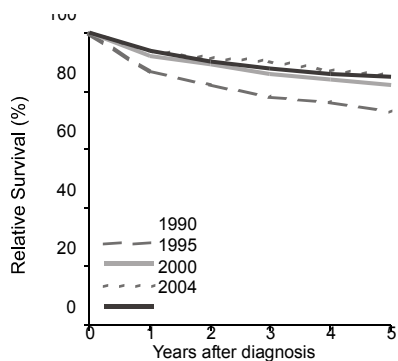
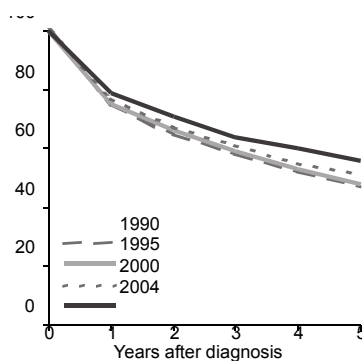


Figure 10: Survival for Victorians with specific subtypes of LHN for selected years from 1990

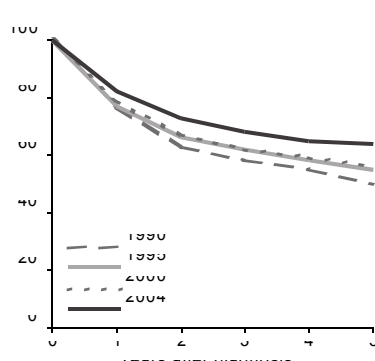
Hodgkin lymphoma



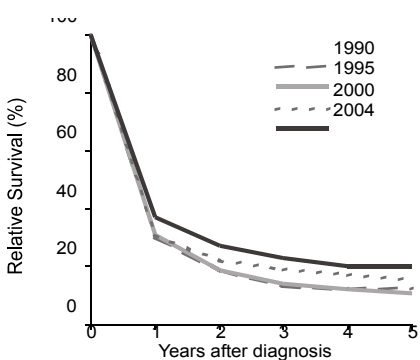
Mature B-cell neoplasms



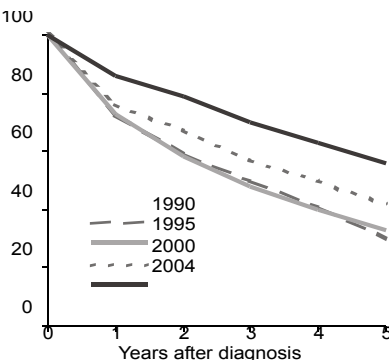
Acute lymphoblastic leukaemia



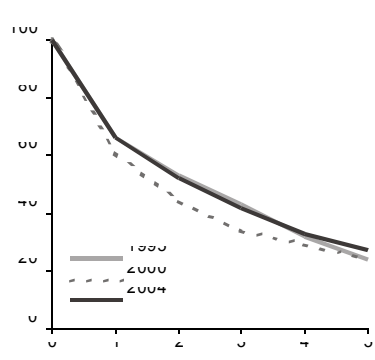
Acute myeloid leukaemia



Chronic myeloid leukaemia



Myelodysplastic syndromes



Population variation

As with many types of cancer, there is significant variation in incidence rates between countries and ethnic groups for LHN. Some broad comparisons for Non-Hodgkin lymphomas (NHL) and leukaemias are shown here for migrant groups within Victoria and for selected countries worldwide. Whilst these comparisons are interesting, it should be noted that both NHL and leukaemias are themselves groups of disparate diseases and that these broad comparisons may mask significant differences in separate disease entities.

Migrants to Australia

Figure 10 shows leukaemia and NHL rates for Australian-born Victorians compared with those for migrants from major world regions. Leukaemia was generally less common in migrants than in the Australian-born and significantly lower rates were observed in migrants from the United Kingdom & Ireland (males), Southern Europe (males) and South-East Asia (both sexes). No migrant group had significantly higher rates than the Australian-born.

NHL, like leukaemia, tended to be less common in migrants and significantly so in those from the United Kingdom & Ireland and North-East Asia (both sexes), North America (males) and South & Central America (females).

Though few differences are statistically significant, there are some differences in patterns for leukaemia and NHL. In particular, NHL rates in migrants from the Middle East (female) and Southern Europe (both sexes) tended to be higher than those in the Australia-born but leukaemia rates were lower.

The patterns of incidence rates are generally consistent with those observed in the regions from which migrants' originated.

Note that the numbers of diagnoses in last 3 regions, the Americas and Africa, are very small and confidence intervals are therefore very wide making interpretation difficult.

Regional Variation

The rates for both leukaemia and NHL (Figure 10) tended to be highest in developed countries with populations of predominantly white European background - New Zealand, Canada, United States, Australia and the United Kingdom.

Within Southern Europe, there are differences between individual countries - both NHL and leukaemia have higher rates in Italy than Greece but the difference is much more pronounced in NHL. In Italy the ratio of female to male rates is also higher than in other selected countries.

Israel has high rates of both leukaemia and NHL. A genetic predisposition to these, as well as breast and ovarian cancers, in Ashkenazy Jews (of Eastern European origin) has been widely recognised.

Incidence of NHL, and to a lesser extent leukaemia, has risen dramatically worldwide over the last two decades. This may be partly, but not wholly, explained by improvements in the accuracy of diagnostic practise. For NHL, increasing levels of known risk factors such as immunosuppression and HIV infection have also contributed to the rise.

Figure 10: Incidence of leukaemia and Non-Hodgkin lymphoma by region of birth, Victoria.

NHL and leukaemia diagnosed in Victorians in 2004-2008 by region of birth. Data from the Victorian Cancer Registry (unpublished). Graph shows the age-standardised incidence rate per 100,000 with 95% confidence interval (CI) for women born in each region. The yellow band indicates the 95% CI for the rate in Australian-born women. If the CI for a migrant group overlaps this Australian-born band, the rates do not differ significantly.

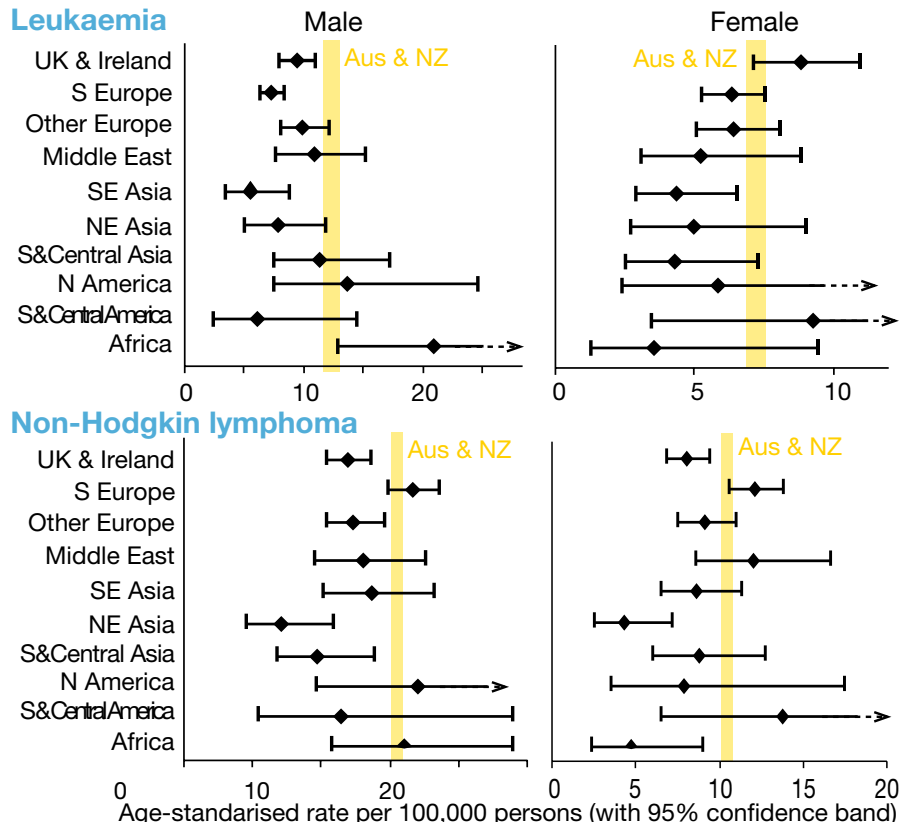
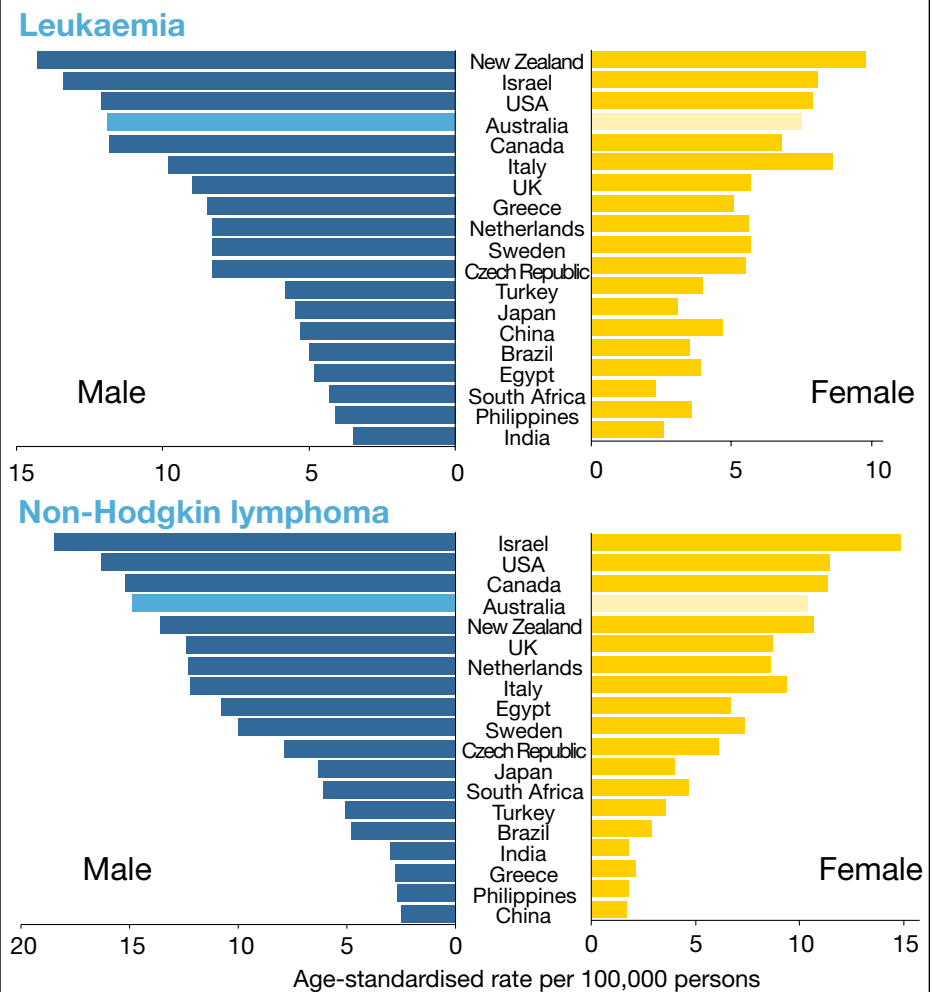


Figure 11: International incidence of LHN - Non-Hodgkin lymphoma and leukaemia.

Estimates of incidence and mortality in 2008 for selected countries worldwide from Globocan¹⁸. Countries are grouped into regions according to the highest incidence rate reported for each region. Rates are age-standardised rates per 100,000 persons standardised to the World Standard Population.



Clinical information by disease

This section describes, for some common haematological malignancies,

- **Clinical features**
- **Diagnostic investigations**
- **Treatment choices**
- **Prognosis**

Hodgkin lymphoma

Clinical features

- lymph node enlargement, most often of the cervical nodes
- enlargement of the liver/spleen
- 'B' symptoms: fever, drenching night sweats, weight loss of >10% body weight

Diagnostic investigations

- blood count
- erythrocyte sedimentation rate
- liver biochemistry
- uric acid
- chest X-ray
- CT scans
- bone marrow aspirate and trephine biopsy
- lymph node biopsy

Treatment choices

- choice of treatment will depend on stage, sites of involvement, the 'bulk' of lymph node masses and the presence or absence of 'B' symptoms
- patients with stage I and II disease are generally treated with combination chemo-radiotherapy
- patients with a large mediastinal mass are usually given chemotherapy first, and subsequent radiotherapy
- treatment for stage III and IV disease comprises of combination chemotherapy. Recently, chemotherapy has been intensified for patients considered to have high risk disease

Prognosis

- prognosis is closely correlated to the stage, and the survival of patients in whom recurrence occurs is inferior to that of those who remain in continuous remission

Acute lymphoblastic leukaemia

Clinical features

- predominantly a disease of children
- symptoms of anaemia
- repeated fever, infection and abscesses
- bruising and/or bleeding
- enlargement of lymph nodes and/or liver and spleen

Diagnostic investigations

- full blood count
- blood film
- bone marrow aspirate

Treatment choices

- aim of treatment is to return the bone marrow to normal and the person to be in good health
- cyclical combination chemotherapy forms the basis of most treatment regimens. Other drugs are used when the chance of recurrence is high
- treatment includes prophylactic intrathecal drugs via lumbar puncture with or without prophylactic radiotherapy to the cerebral meninges
- many receive oral maintenance therapy for 2-3 years

Prognosis

- ninety percent of children respond to treatment, and 60-70% are cured. Among adults, only 30% are cured
- recurrence could be fatal if a second remission is not achieved with high-dose therapy and some form of transplant procedure. Recurrence occurs mostly in bone marrow and is associated with a worse prognosis.

Chronic lymphocytic leukaemia/Small lymphocytic lymphoma

Clinical features

- bone marrow failure leads to anaemia, infection and bleeding
- recurrent infections
- symptoms of anaemia
- painless lymph node enlargement and splenomegaly

Diagnostic investigations

- FBE
- immunophenotype by flow cytometry
- serum immunoglobulins
- Coombs' test

Treatment choices

- the disease may remain stable for many years. There is no advantage in treating before there is a clinical indication
- chemotherapy options are increasing and should be selected using a risk-adapted approach (anticipating tolerance to treatment)
- haemolysis in the first instance is treated with high-dose steroids

Prognosis

- median survival of patients with stage 0 (or stage A) disease is over 10 years, compared with 5 years for patients presenting with stage II or IV (or stage C) disease

Diffuse large B-cell lymphoma

Clinical features

- aggressive lymphoma
- can affect any age group
- bone marrow infiltration is uncommon
- potentially curable

Treatment choices

- chemotherapy is given with curative intent. Achievement of remission is a prerequisite for cure.
- treatment usually comprises an anthracycline (e.g. doxorubicin) given with cyclophosphamide, vincristine and prednisolone
- monoclonal antibody agent eg CD20 (Rituximab) is generally combined with chemotherapy
- the main complication of treatment is fatal infection as result of myelosuppression

Prognosis

- histology, stage, increased serum lactate dehydrogenase (LDH) and performance status correlate with survival (when adjusted for age). Patients with 2 or all of these at presentation have a worse prognosis
- recurrent high-grade lymphoma has a grave prognosis, although some who respond to further chemotherapy at recurrence can be cured with myeloablative therapy

Follicular lymphoma

Clinical features

- low-grade lymphoma
- affects middle-aged and older people
- bone marrow infiltration is common
- early stage disease is potentially curable with radiotherapy
- advanced stage disease is generally incurable with conventional dose therapy

Treatment

- repeated remissions can usually be achieved with relatively simple treatment, such as with the alkylating agent, chlorambucil

Prognosis

- response rate is 75% with a median survival of 9 years. Most are able to lead a normal life during this time, although the disease remains incurable with conventional therapy

Multiple myeloma

Clinical features

- disease of the elderly.
- bone destruction – fractures of long bones, vertebral collapse, hypercalcaemia
- bone marrow infiltration – anaemia, neutropenia and thrombocytopenia
- renal impairment
- recurrent infections

Diagnosis

- in order to make a diagnosis of myeloma, patients need 2 out of 3 of the following diagnostic features:
 - paraprotein or Bence Jones protein
 - radiological evidence of lytic lesions
 - an increase in bone marrow plasma cells

Diagnostic investigations

- full blood count
- ESR
- blood film
- urea and electrolytes
- serum calcium
- serum alkaline phosphatase
- total protein
- serum albumin
- serum protein electrophoresis
- uric acid
- skeletal survey
- 24-hour urine
- bone marrow aspirate

Treatment choices

- generally regarded as incurable, many treatment modalities are being tested. Corrective and supportive care is necessary in terms of:
 - anaemia
 - infection
 - bone pain
 - prevention of pathological fractures
- patients with bony lesions, bone marrow failure and renal impairment are treated with chemotherapy immediately

Prognosis

- with conventional therapy, the median survival is around 3-4 years. Younger patients receiving more intensive therapy may live longer. With alkylating agents in conjunction with prednisolone, the median survival of patients with advanced disease has increased from 7 months to 2.5 years. Chemotherapy may induce a period of freedom from disease progression, known as the 'plateau phase'

Acute myeloid leukaemia

Clinical features

- symptoms of anaemia
- repeated fever, infection and abscesses
- bruising and/or bleeding
- occasional enlargement of lymph nodes and/or liver and spleen

Diagnostic investigations

- full blood count
- blood film
- bone marrow aspirate

Treatment choices

- aim of treatment is complete remission
- treatment comprises of 2 parts: remission induction and post-remission therapy. Corrective therapy for anaemia, infection and other complications are also part of the treatment
- second remissions are more difficult to achieve and are not durable

Prognosis

- potentially curable in 30% of patients under 60 years old. With modern combination chemotherapy, 70-80% under 60 years will enter complete remission and return to normal health
- among older patients, 50-60% will achieve remission. However, the disease will recur in at least 60% within 1-3 years

Chronic myeloid leukaemia

Clinical features

- almost exclusively a disease of adults
- anaemia
- sweating at night, fever, weight loss
- enlargement of the spleen (and abdominal discomfort as a result)
- symptoms of leucostasis due to high white cell count – blurred vision, headache
- retinal haemorrhages due to leucostasis

Diagnostic investigations

- blood count
- platelet count
- bone marrow aspirate

Treatment and prognosis

- Tyrosine kinase inhibitors, such as imatinib (Glivec), are now the standard of care and have improved survival to 90% at five years
- myeloablative therapy supported by allogeneic bone marrow transplantation can be curative, but is limited by donor availability.

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Glossary

| | |
|--------|--|
| AACR | Australasian Association of Cancer Registries |
| ABCR | Australian Blood Cancer Registry |
| WHO | World Health Organisation |
| VCR | Victorian Cancer Registry |
| ICDO-3 | International Classification of Diseases for Oncology, Third edition |
| LHN | Lymphohaematopoietic neoplasms (haematological malignancies) |
| CCV | Cancer Council Victoria |
| VCOG | Victorian Cooperative Oncology Group |

Appendix 1: Mapping of ICDO-3⁴ morphology codes to the AACR reporting categories for lymphohaematopoietic

Note: Major AACR reporting categories are shown in gold with subcategories in blue text. The list of all corresponding ICDO-3 codes⁴, with first descriptor, is listed for each category in black text

LYMPHOID NEOPLASMS

Hodgkin lymphomas

- 9650 Hodgkin lymphoma NOS
- 9651 Hodgkin lymphoma, lymphocyte-rich
- 9652 Hodgkin disease, mixed cellularity NOS
- 9653 Hodgkin lymphoma, lymphocyte depletion NOS
- 9654 Hodgkin lymphoma, lymphocytic depletion, diffuse fibrosis
- 9655 Hodgkin lymphoma, lymphocytic depletion, reticular
- 9659 Hodgkin lymphoma, nodular lymphocyte predominance
- 9661 Hodgkin granuloma
- 9662 Hodgkin sarcoma
- 9663 Hodgkin lymphoma, nodular sclerosis NOS
- 9664 Hodgkin lymphoma, nodular sclerosis, cellular phase
- 9665 Hodgkin lymphoma, nodular sclerosis, grade 1
- 9667 Hodgkin lymphoma, nodular sclerosis, grade 2

Mature B-cell neoplasms

CLL/small lymphocytic lymphoma

- 9670 Lymphoma, small B lymphocytic NOS
- 9823 B-cell chronic lymphocytic leukaemia/small lymphocytic lymphoma

Diffuse large B-cell lymphoma

- 9680 Lymphoma, large B-cell, diffuse NOS

Follicular lymphoma

- 9690 Follicular lymphoma NOS
- 9691 Follicular lymphoma, grade 2
- 9695 Follicular lymphoma, grade 1
- 9698 Follicular lymphoma, grade 3

Plasma cell disorders

- 9731 Plasmacytoma NOS
- 9732 Multiple myeloma
- 9733 Plasma cell leukaemia
- 9734 Plasmacytoma, extramedullary

Other mature B-cell neoplasms

- 9596 Composite Hodgkin and Non-Hodgkin lymphoma
- 9671 Lymphoma, lymphoplasmacytic
- 9673 Mantle cell lymphoma
- 9675 Lymphoma, mixed small and large cell, diffuse
- 9678 Primary effusion lymphoma
- 9679 Mediastinal large B-cell lymphoma
- 9684 Lymphoma, large B-cell, diffuse, immunoblastic NOS
- 9687 Burkitt lymphoma NOS
- 9689 Splenic marginal zone B-cell lymphoma
- 9699 Marginal zone B-cell lymphoma NOS
- 9761 Waldenstrom macroglobulinaemia
- 9764 Immunoproliferative small intestinal disease
- 9826 Burkitt cell leukaemia
- 9833 Prolymphocytic leukaemia, B-cell type
- 9940 Hairy cell leukaemia

Appendix 1: Mapping of ICDO-3 morphology codes to the AACR reporting categories for lymphohaematopoietic

Mature T- and NK-cell neoplasms

- 9700 Mycosis fungoides
- 9701 Sezary syndrome
- 9702 Mature T-cell lymphoma NOS
- 9705 Angioimmunoblastic T-cell lymphoma
- 9708 Subcutaneous panniculitis-like T-cell lymphoma
- 9709 Cutaneous T-cell lymphoma NOS
- 9714 Anaplastic large cell lymphoma, T cell and Null cell type

- 9716 Hepatosplenic gamma-delta cell lymphoma
- 9717 Intestinal T-cell lymphoma
- 9718 Primary cutaneous CD30+ T-cell lymphoproliferative disorder
- 9719 NK/T-cell lymphoma, nasal and nasal-type
- 9827 Adult T-cell leukaemia/lymphoma
- 9831 T-cell granular lymphocytic leukaemia
- 9834 Polymphocytic leukaemia, T-cell type
- 9948 Aggressive NK-cell leukaemia

Acute lymphoblastic leukaemia

- 9727 Precursor cell lymphoblastic lymphoma NOS
- 9728 Precursor B-cell lymphoblastic lymphoma
- 9729 Precursor T-cell lymphoblastic lymphoma
- 9835 Precursor cell lymphoblastic leukaemia NOS
- 9836 Precursor B-cell lymphoblastic leukaemia
- 9837 Precursor T-cell lymphoblastic leukaemia
- 9930 Myeloid sarcoma

Non-Hodgkin lymphoma NOS

- 9591 Lymphoma, Non-Hodgkin NOS
- 9820 Lymphoid leukaemia NOS
- 9832 Polymphocytic leukaemia NOS

Lymphoid neoplasms, NOS

- 9590 Malignant lymphoma NOS

continued over page

MYELOID NEOPLASMS

Acute myeloid leukaemias

- 9805 Acute biphenotypic leukaemia
- 9840 Acute myeloid leukaemia, M6 type
- 9861 Acute myeloid leukaemia NOS
- 9866 Acute promyelocytic leukaemia
- 9867 Acute myelomonocytic leukaemia
- 9870 Acute basophilic leukaemia
- 9871 Acute myeloid leukaemia with abnormal marrow eosinophils
- 9872 Acute myeloid leukaemia, minimal differentiation
- 9873 Acute myeloid leukaemia without maturation
- 9874 Acute myeloid leukaemia with maturation
- 9891 Acute monocytic leukaemia
- 9895 Acute myeloid leukaemia with multilineage dysplasia
- 9896 Acute myeloid leukaemia, t(8;21)(q22;q22)
- 9897 Acute myeloid leukaemia, 11q23 abnormalities
- 9910 Acute megakaryoblastic leukaemia
- 9920 Therapy-related acute myeloid leukaemia NOS
- 9931 Acute panmyelosis with myelofibrosis

Chronic myeloid leukaemia

- 9863 Chronic myeloid leukaemia NOS
- 9875 Chronic myelogenous leukaemia, BCR/ABL positive

Other chronic myeloproliferative diseases

- 9950 Polycythaemia vera
- 9960 Chronic myeloproliferative disease NOS
- 9961 Myelosclerosis with myeloid metaplasia
- 9962 Essential thrombocythaemia
- 9963 Chronic neutrophilic leukaemia
- 9964 Hypereosinophilic syndrome

Myelodysplastic syndromes

- 9980 Refractory anaemia
- 9982 Refractory anaemia with sideroblasts
- 9983 Refractory anaemia with excess of blasts
- 9984 Refractory anaemia with excess blasts in transformation
- 9985 Refractory cytopenia with multilineage dysplasia
- 9986 Myelodysplastic syndrome with 5q deletion syndrome
- 9987 Therapy-related myelodysplastic syndrome NOS
- 9989 Myelodysplastic syndrome NOS

Myelodysplastic/myeloproliferative diseases

- 9876 Atypical chronic myeloid leukaemia, BCR/ABL negative
- 9945 Chronic myelomonocytic leukaemia NOS
- 9946 Juvenile myelomonocytic leukaemia

Myeloid neoplasms, NOS

- 9860 Myeloid leukaemia NOS

LYMPHOID/MYELOID NEOPLASMS NOS

- 9800 Leukaemia NOS
- 9801 Acute leukaemia NOS

OTHER LYMPHOID/HAEMATOPOIETIC NEOPLASMS

Mast cell diseases

- 9740 Mast cell sarcoma
- 9741 Malignant mastocytosis
- 9742 Mast cell leukaemia

Histiocytic & dendritic cell neoplasms

- 9750 Malignant histiocytosis
- 9754 Langerhans cell histiocytosis, disseminated
- 9755 Histiocytic sarcoma
- 9756 Langerhans cell sarcoma
- 9757 Interdigitating dendritic cell sarcoma
- 9758 Follicular dendritic cell sarcoma

Immunoproliferative diseases

- 9760 Immunoproliferative disease NOS

Heavy Chain Disease

- 9762 Heavy chain disease NOS

No histological diagnosis (including Death certificate only)

Note: NOS=not otherwise specified

Appendix 2: Comparison of total new cases and reported incidence for LHNs diagnosed in Victoria 2008

Key:

T = Total reported diagnoses in 2008 (whether included in incidence or not)

NI = Diagnosed in 2008 but not counted in incidence (see explanation on page 31)

%NI = % not counted in incidence reporting i.e. % of this group who had a prior tumour of the same histological group (for multiple primary reporting).

| Subtype according to AACR classification | | Age group at diagnosis | | | |
|--|-----|------------------------|-------|-------|----------|
| | | Under 30 | 30-69 | 70+ | All ages |
| Lymphoid neoplasms | | | | | |
| Hodgkin Lymphomas | NI | 0 | 0 | 0 | 0 |
| | NI% | 0.0% | 0.0% | 0.0% | 0.0% |
| | T | 54 | 73 | 26 | 153 |
| Mature B-cell Neoplasms | NI | 0 | 27 | 37 | 64 |
| | NI% | 0.0% | 3.4% | 4.9% | 4.1% |
| | T | 24 | 802 | 749 | 1575 |
| <i>Chronic lymphocytic leukaemia/ Small Lymphocytic Lymphoma</i> | NI | 0 | 4 | 2 | 6 |
| | NI% | 0.0% | 3.7% | 1.4% | 2.4% |
| | T | 1 | 109 | 138 | 248 |
| <i>Diffuse Large B-cell Lymphoma</i> | NI | 0 | 17 | 22 | 39 |
| | NI% | 0.0% | 7.7% | 11.3% | 9.2% |
| | T | 11 | 221 | 194 | 426 |
| <i>Follicular Lymphoma</i> | NI | 0 | 1 | 4 | 5 |
| | NI% | 0.0% | 0.5% | 5.1% | 1.9% |
| | T | 1 | 185 | 78 | 264 |
| <i>Plasma Cell Disorders</i> | NI | 0 | 1 | 5 | 6 |
| | NI% | - | 0.6% | 2.3% | 1.5% |
| | T | 0 | 167 | 222 | 389 |
| <i>Other Mature B-cell Neoplasms</i> | NI | 0 | 4 | 4 | 8 |
| | NI% | 0.0% | 3.3% | 3.4% | 3.2% |
| | T | 11 | 120 | 117 | 248 |
| Mature T- And NK-cell Neoplasms | NI | 0 | 0 | 1 | 1 |
| | NI% | 0.0% | 0.0% | 2.4% | 1.0% |
| | T | 9 | 47 | 42 | 98 |
| Acute Lymphoblastic Leukaemia | NI | 0 | 0 | 0 | 0 |
| | NI% | 0.0% | 0.0% | 0.0% | 0.0% |
| | T | 52 | 22 | 7 | 81 |
| Non-Hodgkin Lymphoma Nos | NI | 0 | 2 | 3 | 5 |
| | NI% | 0.0% | 4.4% | 6.1% | 5.2% |
| | T | 2 | 45 | 49 | 96 |
| Lymphoid Neoplasms, Nos | NI | 0 | 2 | 3 | 5 |
| | NI% | - | 4.4% | 7.3% | 5.8% |
| | T | 0 | 45 | 41 | 86 |

Explanation of tables:

For each cancer, there is a difference between [annual incidence, as reported in our Canstat reports](#), and [the total number of diagnoses during that year](#). This is discussed in more detail on page 4. The IARC multiple primary rules consider there to be seven groups of "histologically different" types of LHN based on ICDO-3 morphology - Myeloid, B-cell neoplasms, T-cell & NK-cell neoplasms, Hodgkin lymphoma, Mast-cell tumours, Histiocytes & accessory lymphoid cell and Unspecified types. [Though the VCR records separately every primary tumour diagnosed in an individual, only the first diagnosed tumour within one of these groups is counted as an 'incident' tumour](#). For example, a quarter of all AML diagnoses are not 'incident' cancers (where the patient had a prior CMD or MDS) and nearly 10% of DLBCL are not 'incident' (where the patient may have had a prior follicular lymphoma). This table shows total diagnoses for each LHN type and the number of these that are not 'incident' cases. Whilst incidence is a nationally agreed reporting methodology for cancer, the total diagnoses during a period may be of more interest to clinicians and service planners.

| Subtype according to AACR classification | | Age group at diagnosis | | | |
|--|-----|------------------------|-------|-------|-------|
| | | Under 30 | 30-69 | 70+ | Total |
| Myeloid neoplasms | | | | | |
| Acute Leukaemias | NI | 0 | 23 | 56 | 79 |
| | NI% | 0.0% | 19.7% | 32.6% | 25.6% |
| | T | 19 | 117 | 172 | 308 |
| Chronic Leukaemia | NI | 0 | 0 | 0 | 0 |
| | NI% | 0.0% | 0.0% | 0.0% | 0.0% |
| | T | 2 | 32 | 29 | 63 |
| Other Chronic Myeloproliferative Diseases | NI | 0 | 1 | 0 | 1 |
| | NI% | 0.0% | 1.7% | 0.0% | 0.9% |
| | T | 4 | 60 | 45 | 109 |
| Myelodysplastic Syndromes | NI | 0 | 6 | 5 | 11 |
| | NI% | 0.0% | 13.6% | 3.0% | 5.2% |
| | T | 3 | 44 | 164 | 211 |
| Myelodysplastic/Myeloproliferative Diseases | NI | 0 | 0 | 0 | 0 |
| | NI% | 0.0% | 0.0% | 0.0% | 0.0% |
| | T | 3 | 13 | 63 | 79 |
| Myeloid Neoplasms, Nos | NI | 0 | 0 | 0 | 0 |
| | NI% | - | 0.0% | 0.0% | 0.0% |
| | T | 0 | 1 | 4 | 5 |
| Lymphoid/Myeloid Neoplasms, Nos | NI | 0 | 0 | 2 | 2 |
| | NI% | 0.0% | 0.0% | 33.3% | 25.0% |
| | T | 1 | 1 | 6 | 8 |
| Other Lymphoid/ Haematopoietic Neoplasms | | | | | |
| | NI | 0 | 0 | 0 | 0 |
| | NI% | 0.0% | 0.0% | 0.0% | 0.0% |
| | T | 2 | 6 | 3 | 11 |
| No histological confirmation (including Death Certificate Only) | | | | | |
| | NI | 0 | 1 | 18 | 19 |
| | NI% | - | 11.1% | 19.4% | 18.6% |
| | T | 0 | 9 | 93 | 102 |

Victorian Cancer Registry publications

Canstats

Annual Victorian Cancer Registry statistical reports were produced for the years 1982–1990. From 1991–2009 these annual data have been published in the Canstat series.

Other Canstat titles include:

- Cancer in Adolescents and Young Adults
- Prostate Cancer
- Testicular Cancer
- Trends in Cancer Mortality, Australia 1910–1999
- Lung Cancer
- A Guide to the Victorian Cancer Registry
- Breast Cancer
- Skin Cancer
- Ovarian Cancer
- Brain & CNS Cancer

Reports

English D, Farrugia H, Thursfield V, Chang P, Giles G. April 2008. Cancer Survival Victoria 2008. Estimates of survival in 2004 (and comparison with earlier periods)

Karahalios E, English D, Thursfield V, Simpson J, Farrugia H, Giles G. Aug 2009. Second primary Cancers in Victoria.

All publications are available for download, in pdf format, from our website at : <http://www.cancervic.org.au/about-our-research/cancer-statistics>

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