# CANCERS OF THE BLOOD

This document provides statistical information about haematological and lymphoid tissue cancers (blood cancers) in Northern Ireland. This includes leukaemia, lymphoma, and myeloma.

**Leukaemia summary table**

| NUMBER OF CASES PER YEAR (2012-2016)[1] | | | NUMBER OF DEATHS PER YEAR (2012-2016) | | |
|---|---|---|---|---|---|
| Male | Female | Both sexes | Male | Female | Both sexes |
| 122 | 87 | 209 | 70 | 49 | 119 |
| **FIVE-YEAR SURVIVAL (2006-2010)** | | | **24-YEAR PREVALENCE (2016)** | | |
| Male | Female | Both sexes | Male | Female | Both sexes |
| 52.0% | 54.8% | 53.3% | 861 | 640 | 1,501 |

**Lymphoma summary table**

| NUMBER OF CASES PER YEAR (2012-2016)[1] | | | NUMBER OF DEATHS PER YEAR (2012-2016) | | |
|---|---|---|---|---|---|
| Male | Female | Both sexes | Male | Female | Both sexes |
| 217 | 174 | 391 | 71 | 64 | 136 |
| **FIVE-YEAR SURVIVAL (2006-2010)** | | | **24-YEAR PREVALENCE (2016)** | | |
| Male | Female | Both sexes | Male | Female | Both sexes |
| 62.1% | 66.7% | 64.5% | 1,819 | 1,679 | 3,498 |

**Myeloma summary table**

| NUMBER OF CASES PER YEAR (2012-2016)[1] | | | NUMBER OF DEATHS PER YEAR (2012-2016) | | |
|---|---|---|---|---|---|
| Male | Female | Both sexes | Male | Female | Both sexes |
| 78 | 61 | 139 | 42 | 38 | 80 |
| **FIVE-YEAR SURVIVAL (2006-2010)** | | | **24-YEAR PREVALENCE (2016)** | | |
| Male | Female | Both sexes | Male | Female | Both sexes |
| 49.3% | 51.6% | 50.5% | 421 | 318 | 739 |

[1] Mean yearly incidence data for period 2012-2016 has been rounded to nearest integer, and thus some numbers in tables will not add to give the exact total.

## INCIDENCE

Between 2011 and 2015 there were an average of 748 people diagnosed with a form of blood cancer each year. Of these 748 diagnoses, 56% were in men and 44% were in women. The probability of being diagnosed with a form of blood cancer in Northern Ireland before the age of 75 varies from 1 in 235 for myeloma to approximately 1 in 71 for lymphoma (probability of a leukaemia diagnosis is 1 in 142). Men are consistently more likely to be diagnosed with all forms of blood cancer (including leukaemia, lymphoma, and myeloma) when compared to women.

## Incidence trends

*Table 1: Incidence of leukaemia by gender and year of diagnosis: 2007-2016*

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|
| Males | 107 | 130 | 110 | 144 | 142 | 123 | 129 | 121 | 125 | 114 |
| Females | 75 | 93 | 91 | 88 | 104 | 82 | 80 | 88 | 107 | 78 |
| Both | 182 | 223 | 201 | 232 | 246 | 205 | 209 | 209 | 232 | 192 |

*Table 2: Incidence of lymphoma by gender and year of diagnosis: 2007-2016*

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|
| Males | 167 | 171 | 183 | 205 | 220 | 221 | 221 | 211 | 217 | 217 |
| Females | 188 | 164 | 160 | 178 | 194 | 157 | 167 | 196 | 177 | 172 |
| Both | 355 | 335 | 343 | 383 | 414 | 378 | 388 | 407 | 394 | 389 |

*Table 3: Incidence of myeloma by gender and year of diagnosis: 2007-2016*

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|
| Males | 85 | 71 | 74 | 53 | 79 | 62 | 73 | 83 | 84 | 89 |
| Females | 45 | 50 | 59 | 54 | 54 | 40 | 54 | 73 | 65 | 74 |
| Both | 130 | 121 | 133 | 107 | 133 | 102 | 127 | 156 | 149 | 163 |

Over a ten-year period the number of blood cancer cases each year has increased in males and females from 667 in 2007 to 744 in 2016. After accounting for changes in the age of the population, incidence of leukaemia and myeloma has remained stable in men and women in Northern Ireland. Incidence of lymphoma in men increased by 8.3% each year since 2007 after a non-statistically significant decrease in incidence from 1993 to 2007, (see figure 1), before another 3% drop until 2016. Incidence of lymphoma in women has steadily increased significantly by almost 1% each year since 1993 (see figure 2).

*Figure 1: Trends in blood cancer incidence rates: in males 1993-2016*

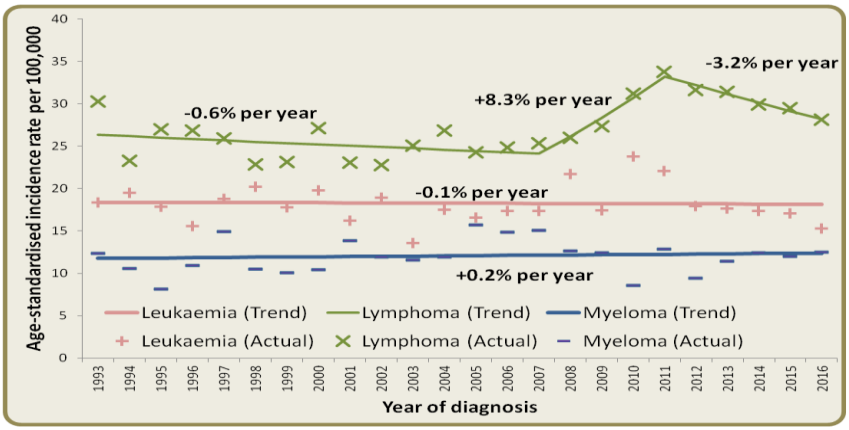
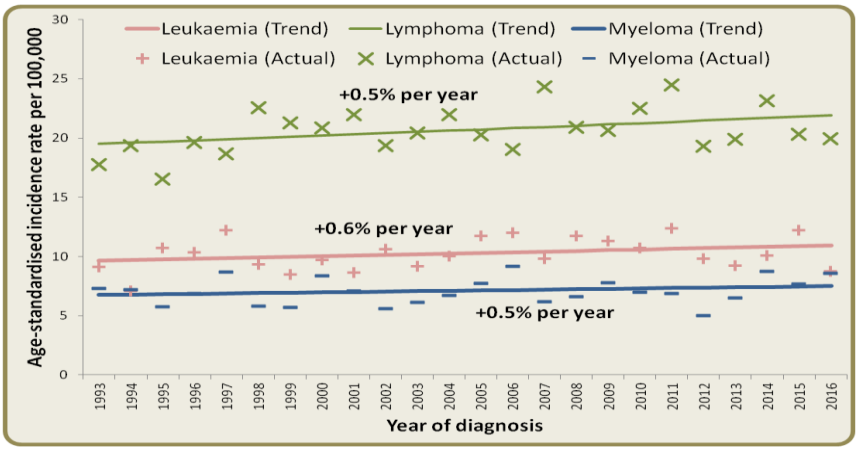



*Figure 2: Trends in blood cancer incidence rates: in females 1993-2016*

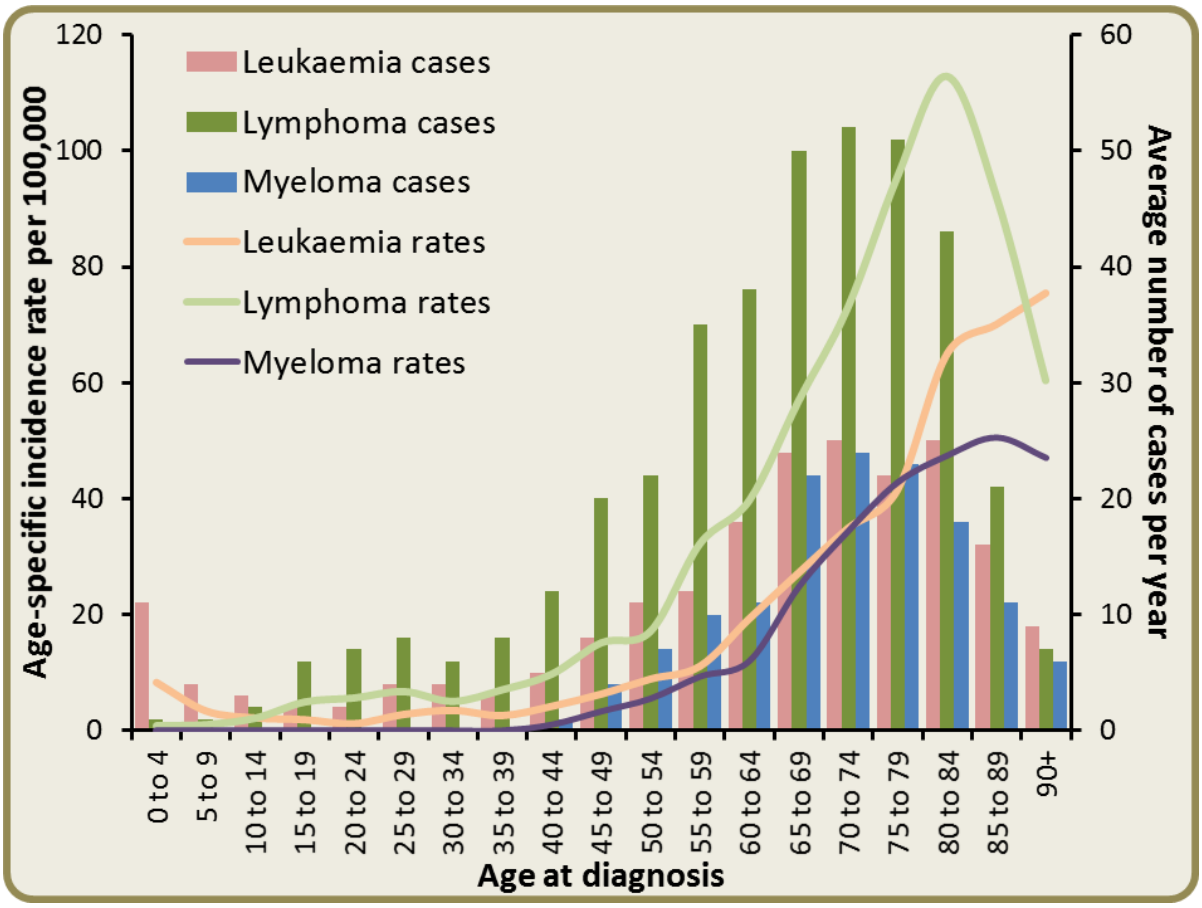


## Incidence and age

The incidence of all three forms of blood cancer is associated with increasing age although some subtle differences exist between each type of cancer. There is an early peak in leukaemia incidence rate per 100,000 between the ages of 0-4 before incidence falls to a baseline of approximately 3-4 cases per 100,000 of the population. After the age of 60 there is a steady increase in incidence of leukaemia, which peaks at over 75 cases per 100,000 of the population in ages of over 90.

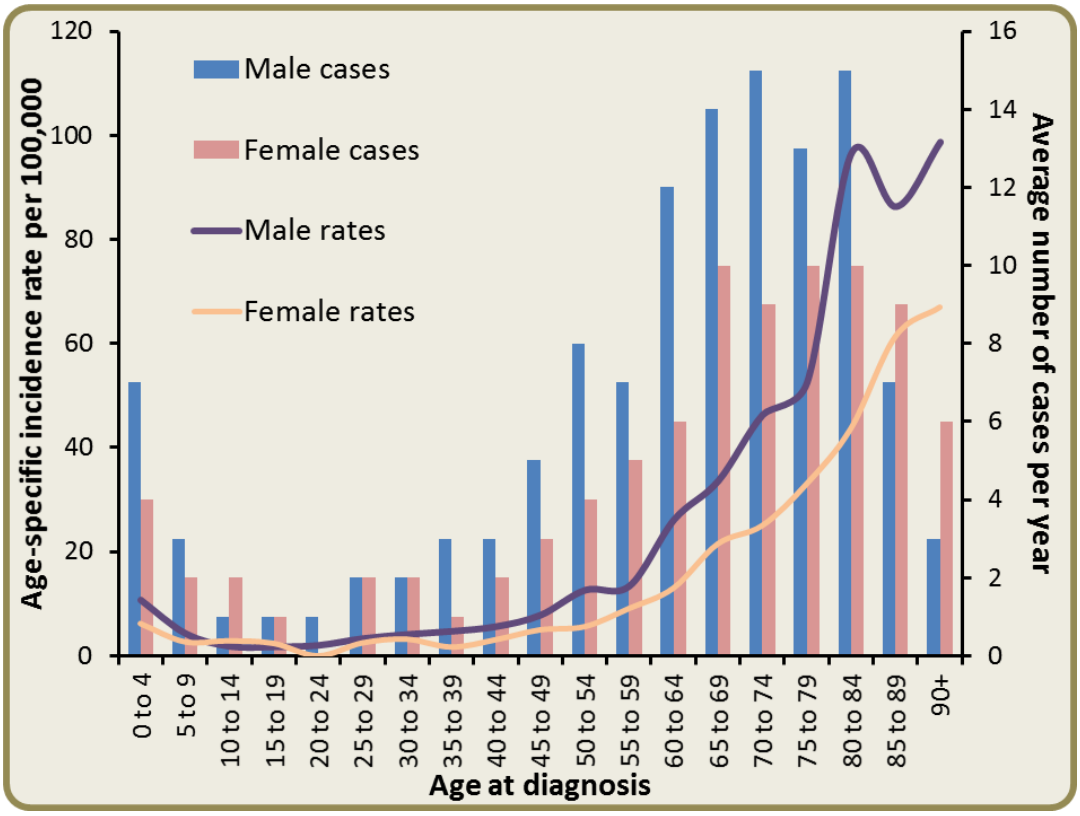
Incidence of lymphoma remains low until the age of 50. Thereafter, incidence steadily rises before reaching a peak of over 100 cases per 100,000 of the population (i.e. 1 case per 1,000) between the ages of 75 and 85. Incidence of lymphoma steadily decreases after the age of 85. Myeloma incidence is *strongly linked* with age. Adults aged between 80 and 89 years experience the highest incidence (over 50 cases per 100,000 of the population) of myeloma.

*Figure 3: Incidence of blood cancer by age and type: 2011-2016*



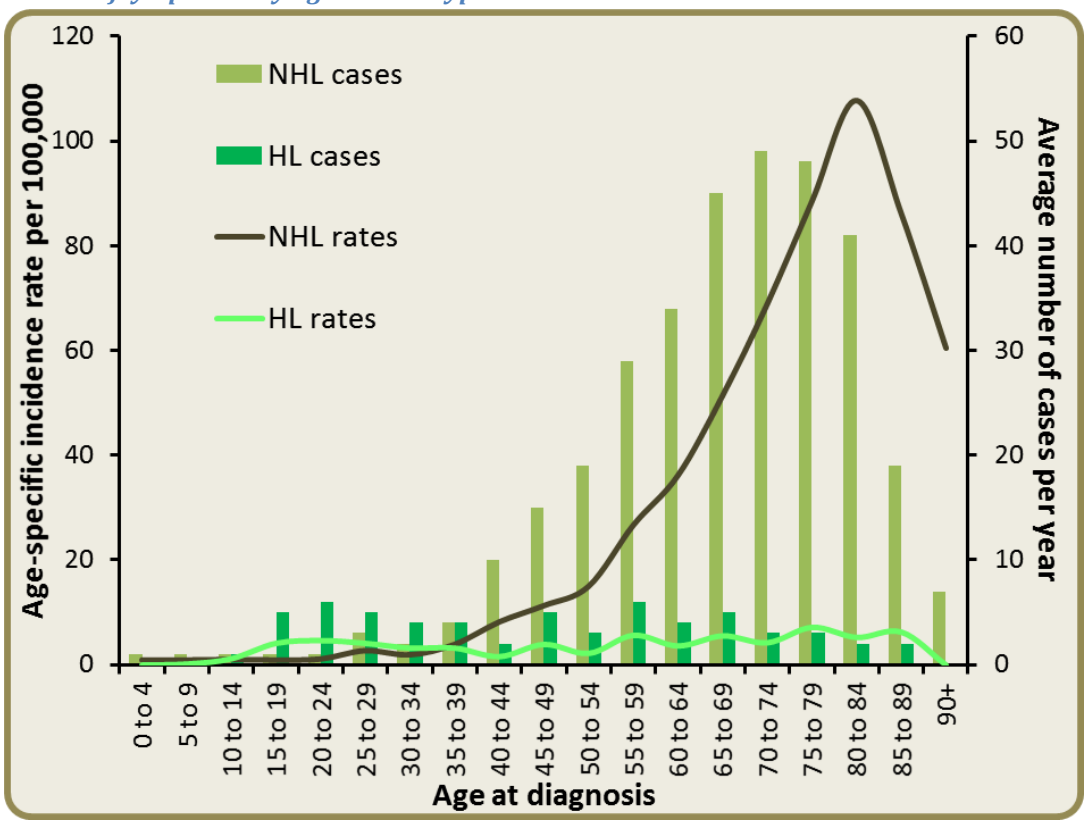

Further analysis to explore differences in incidence of blood cancers between gender and type produces some interesting information. Incidence of leukaemia in males and females remains low after an early peak during infancy. After the age of 60 incidence of leukaemia in males and females begins to separate out, with male incidence rate increasing to a peak of almost 100 cases per 100,000 people in males over the age of 90. Women experience a lower leukaemia incidence rate than men with a peak of 67 cases per 100,000 females over the ages of 90 (see figure 4).

*Figure 4: Incidence of leukaemia by age and gender: 2011-2016*




Age-standardised incidence of NHL (non-Hodgkin's lymphoma) in males and females combined is higher than HL (Hodgkin's lymphoma) per 100,000 of the population (see figure 5). Incidence of NHL is strongly linked with age with peak incidence in patients aged 75-85. Incidence of HL never exceeds an average of 10 cases per 100,000 of the population in both genders are combined.

*Figure 5: Incidence of lymphoma by age and subtype: 2011-2016*



### Incidence by Trust area

When both genders were combined there were no statistically significant differences in incidence of leukaemia, lymphoma or myeloma between trusts when compared to the NI average incidence.

### Incidence by deprivation

In 2012-2016 no association between incidences of any of the three forms of blood cancer and socioeconomic deprivation were observed in Northern Ireland suggesting that blood cancer risk factors are independent of socioeconomic status.

## SURVIVAL

The age-standardised five-year survival for people diagnosed with leukaemia between 2006-2010 was 53.3% at five years. The age-standardised five-year survival for people diagnosed with lymphoma during the same time period was 64.5% whilst the age-standardised five-year survival for people diagnosed with myeloma during 2006-2010 was 50.5%. Therefore, lymphoma is the most survivable of the blood cancers (HL has a higher five-year survival rate than NHL).

*Table 4: Five-year leukaemia survival by survival time and gender*

| Time since diagnosis | Diagnosed 2006-2010 | | |
|---|---|---|---|
| | Male | Female | Both sexes |
| 6 months | 78.2% | 75.9% | 77.2% |
| 1 year | 72.7% | 67.4% | 70.5% |
| 5 years | 52.0% | 54.8% | 53.3% |

*Table 5: Five-year lymphoma survival by survival time and gender*

| Time since diagnosis | Diagnosed 2006-2010 | | |
|---|---|---|---|
| | Male | Female | Both sexes |
| 6 months | 81.2% | 84.1% | 82.8% |
| 1 year | 76.7% | 80.1% | 78.5% |
| 5 years | 62.1% | 66.7% | 64.5% |

*Table 6: Five-year myeloma survival by survival time and gender*

| Time since diagnosis | Diagnosed 2006-2010 | | |
|---|---|---|---|
| | Male | Female | Both sexes |
| 6 months | 85.4% | 86.7% | 86.1% |
| 1 year | 77.2% | 81.9% | 79.3% |
| 5 years | 49.3% | 51.6% | 50.5% |

## Survival Trends

Five-year survival for all forms of blood cancer in Northern Ireland has increased from the 1993-2000 diagnosis period to the 2006-2010 diagnosis period in both males and females. Five-year survival after a diagnosis of leukaemia between 1993-2000 was 34.8% and 53.3% between 2006-2010. Five-year survival after a diagnosis of lymphoma between 1993-2000 was 47.3% and 64.5% between 2006-2010. Five-year survival after a diagnosis of myeloma between 1993-2000 was 30.9% and 50.5% between 2006-2010.

This means that five-year survival for all forms of blood cancer has increased by at least 17% from the 1993-2000 to 2006-2010 diagnostic period.

*Table 7: Five-year leukaemia survival by period of diagnosis and gender*

| Period of diagnosis | Male | Female | Both sexes |
|---|---|---|---|
| 1993-2000 | 34.1% | 35.2% | 34.8% |
| 2001-2005 | 41.5% | 49.2% | 45.3% |
| 2006-2010 | 52.0% | 54.8% | 53.3% |

*Table 8: Five-year lymphoma survival by period of diagnosis and gender*

| Period of diagnosis | Male | Female | Both sexes |
|---|---|---|---|
| 1993-2000 | 44.6% | 49.8% | 47.3% |
| 2001-2005 | 58.2% | 61.2% | 59.1% |
| 2006-2010 | 62.1% | 66.7% | 64.5% |

*Table 9: Five-year myeloma survival by period of diagnosis and gender*

| Period of diagnosis | Male | Female | Both sexes |
|---|---|---|---|
| 1993-2000 | 27.3% | 35.0% | 30.9% |
| 2001-2005 | 35.9% | 43.4% | 38.4% |
| 2006-2010 | 49.3% | 51.6% | 50.5% |

# Mortality

In 2012-2016 there were an average of 338 deaths from blood cancer each year of which 136 (41%) were due to lymphoma, 119 (36%) were due to leukaemia, and 80 (23%) were due to myeloma.

## Mortality trends

When adjusted for age and population change, mortality rates amongst all forms of blood cancer in men are falling. Leukaemia rates decreased by -0.4% each year from 1993 to 2016. Lymphoma rates fell by -1.1% each year. Myeloma rates fell significantly by -3.7% from 1993 to 2002 before rising by +9.0% to 2006. After 2006 a significant decline of -8.3% occurred before increasing again by +11.3% from 2012 to 2016.

*Figure 7: Trends in blood cancer mortality rates in men: 1993-2016*

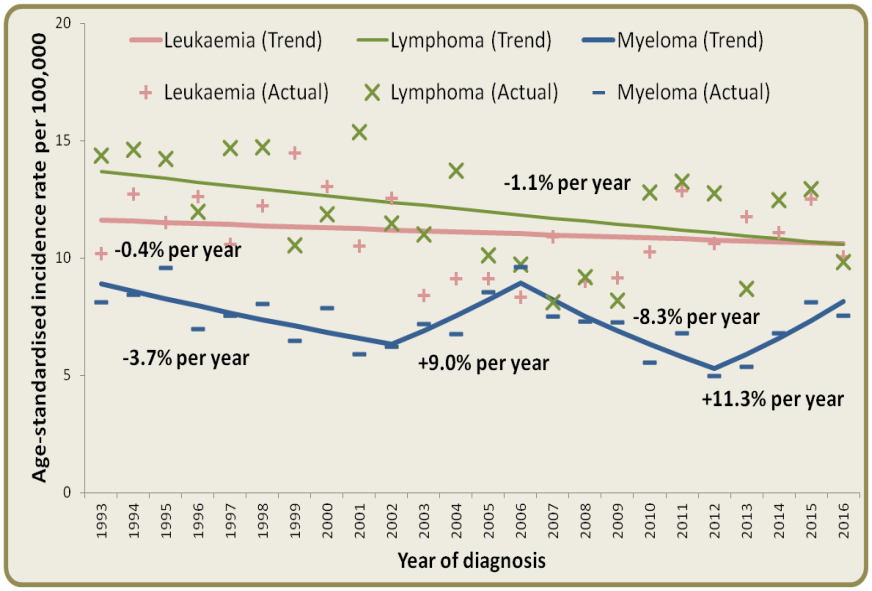
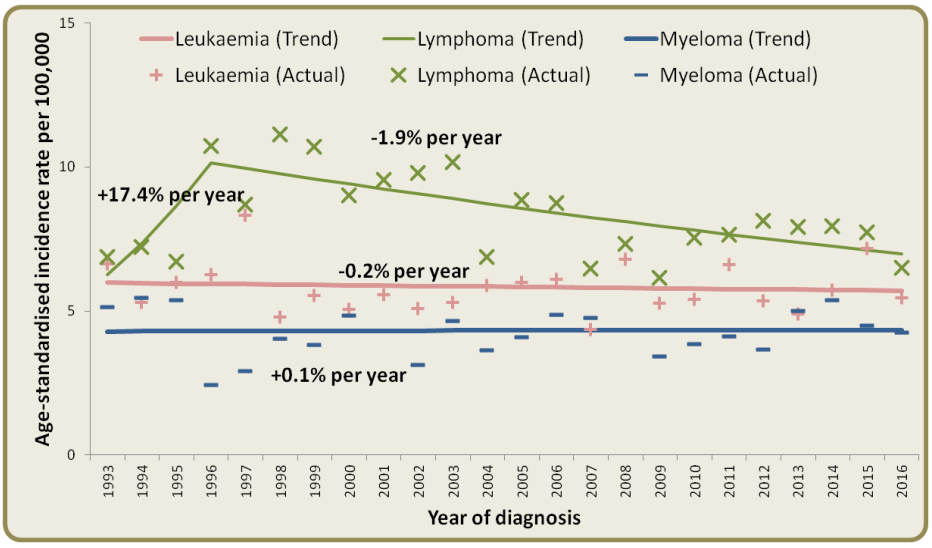



*Figure 8: Trends in blood cancer mortality rates in women: 1993-2016*




Leukaemia and myeloma mortality rates have remained stable in women during the previous twenty four year period. Lymphoma mortality rates have declined significantly by -1.9% each year between 1996 and 2016 after a non-statistically significant rise.

# Prevalence

At the end of 2016 there were a total of 5,738 people living with a haematological malignancy (blood cancer) of which 61% had a diagnosis of lymphoma (26% had a diagnosis of leukaemia and 13% had a diagnosis of myeloma), 54% of those diagnosed were men, 11% had been diagnosed within the previous year, and 58% were living with a diagnosis of blood cancer whilst under the age of 70.

*Table 10: Number of people living with leukaemia at the end of 2016 who were diagnosed from 1993-2016 by time since diagnosis*

| Type | Age | Time since diagnosis | | | | 24-year Prevalence |
|---|---|---|---|---|---|---|
| | | 0-1 year | 1-5 years | 5-10 years | 10-24 years | |
| Leukaemia | 0-69 | 91 | 288 | 233 | 357 | 969 |
| | 70+ | 50 | 164 | 184 | 134 | 532 |
| | All ages | 141 | 452 | 417 | 491 | 1,501 |

*Table 11: Number of people living with lymphoma at the end of 2016 who were diagnosed from 1993-2016 by time since diagnosis*

| Type | Age | Time since diagnosis | | | | 24-year Prevalence |
|---|---|---|---|---|---|---|
| | | 0-1 year | 1-5 years | 5-10 years | 10-24 years | |
| Lymphoma | 0-69 | 194 | 591 | 559 | 727 | 2,071 |
| | 70+ | 136 | 424 | 398 | 469 | 1,427 |
| | All ages | 330 | 1,015 | 957 | 1,196 | 3,498 |

*Table 12: Number of people living with myeloma at the end of 2016 who were diagnosed from 1993-2016 by time since diagnosis*

| Type | Age | Time since diagnosis | | | | 24-year Prevalence |
|---|---|---|---|---|---|---|
| | | 0-1 year | 1-5 years | 5-10 years | 10-24 years | |
| Myeloma | 0-69 | 60 | 131 | 62 | 58 | 311 |
| | 70+ | 88 | 173 | 103 | 64 | 428 |
| | All ages | 148 | 304 | 165 | 122 | 739 |

## Further Information

Further data is available from the Northern Ireland Cancer Registry web site: **www.qub.ac.uk/nicr**

**NI Cancer Registry**
Phone: +44 (0)28 9097 6028
e-mail: nicr@qub.ac.uk

## Acknowledgements

NICR is funded by the Public Health Agency and is hosted by Queen's University, Belfast. This work uses data provided by patients and collected by the NHS as part of their care and support.