National Cancer Registry Ireland **Cancer Trends**

Leukaemia

Incidence trends—all leukaemias

Leukaemias made up about 1.7% of all registered cancers and 2.0% of malignant cancers diagnosed between 1994 and 2008. Between 1994 and 2002 the number of cases increased annually by 4.5% for men and 3.4% for women; however since 2002 there has been no increase in numbers for women, and a downward trend of 3% a year for men. The age-standardised incidence rate has been falling by 6% annually for both sexes since 2000 (Figure 1).

Leukaemia types

80% of leukaemias are of four types—acute lymphatic (ALL), chronic lymphocytic (CLL), acute myeloid (AML) and chronic myeloid (CML) (Figure 2). The distribution of subtypes was similar in women and men. CLL was the commonest type in both sexes, comprising 41% of cases in men and 37% in women. The distribution of leukaemia types was dependent on age (Figure 3). 30% of ALL was diagnosed before the age of 5, and 55% before age 15. The other types were more common in older people—54% of CLL was diagnosed in those aged 70 and over.

The incidence rate was higher in men than in women for all subtypes (Figures 4a and 4b). The age-standardised incidence rate for men for CLL, CML and "other" specified leukaemias was approximately twice that for women, while for ALL and AML, the male incidence rate was 40% higher than that for females. However, for those aged under 15 the male/female ratio was only 1.2 for ALL and 0.8 for AML.

The incidence rate for most leukaemia types fell between 1994-1999 and 2004-2008, the most notable exception being acute myeloid leukaemia (AML) in men (Figure 4b). The largest fall was in "unspecified" leukaemias but this is likely to indicate an improvement in the quality of diagnosis rather than any real change in incidence.

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Figure 1. All leukaemias 1994-2008; number and European age-standardised incidence rate

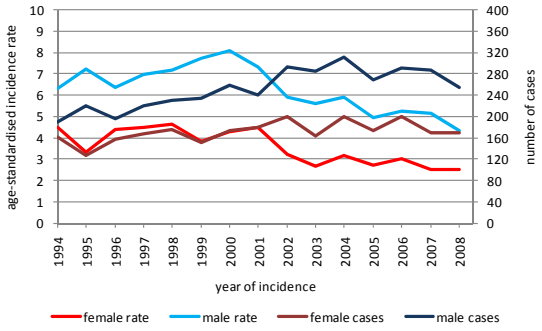


Figure 2. Main leukaemia types, 1994-2008

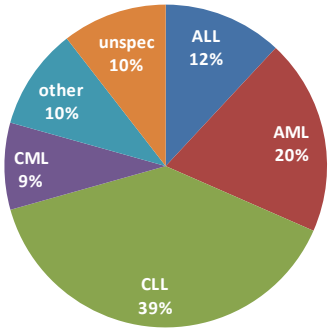


Figure 3. Main leukaemia types by age, 1994-2008

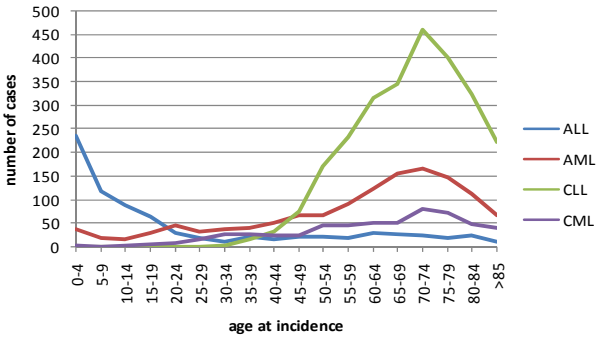
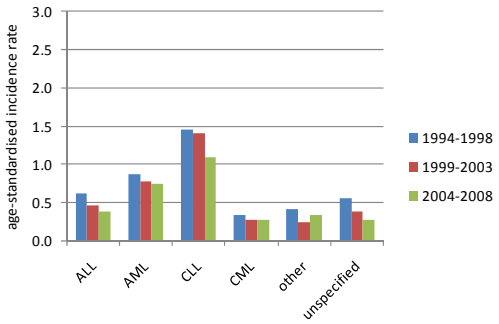
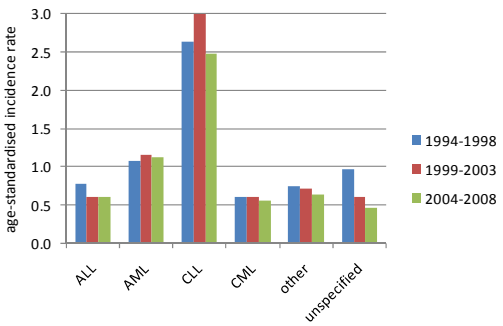


Figure 4. Trends in leukaemia by type and sex 1994-2008

a. female



b. male



Treatment

Chemotherapy was the commonest treatment modality (Figure 5). 48% of leukaemia patients had chemotherapy as primary treatment. This frequency varied by leukaemia type. Almost 90% of ALL patients had chemotherapy as primary treatment, and 60-70% of those with AML and CML. Use was less frequent in patients with CLL. The use of chemotherapy decreased slightly between 1994-1999 and 2004-2008 for the acute leukaemias (ALL and AML) and for CLL.

Only 6% of patients had radiation therapy overall; this fell from 10% in 1994-1999 to 4% in 2004-2008. This fall was particularly marked for ALL and CML after 1998. For ALL, most radiation therapy was given in combination with chemotherapy (Table 1).

Table 1. Combination chemotherapy/radiation therapy 2004-2008

	leukaemia type	
Treatment	**ALL**	**other**
chemo- and radiotherapy	39 (14%)	38 (2%)
chemotherapy only	205 (74%)	831 (41%)
radiotherapy only	8 (3%)	16 (1%)
no cancer-directed therapy	25 (9%)	1,151 (57%)

Survival

Survival was best for CLL (90% at 1 year and 70% at five years from diagnosis) and poorest for AML (Figure 6). For the acute leukaemias, especially AML, most of the mortality occurred in the first year after diagnosis. There was a modest improvement over time in three-year survival for all leukaemias combined, from 60% (58%-62%)[1] in 1994-1997 to 63% (61%-65%) in 2002-2005. The main improvement was for ALL, from 66% (59%-73%) in 1994-1999 to 76% (71%-81%) in 2004-2006 (Figure 7). The EUROCARE data, although now quite dated, shows that survival from leukaemia for patients diagnosed in Ireland in 1995-1999 was relatively good (Figure 8).

Figure 5. Patients having chemotherapy 1994-2008

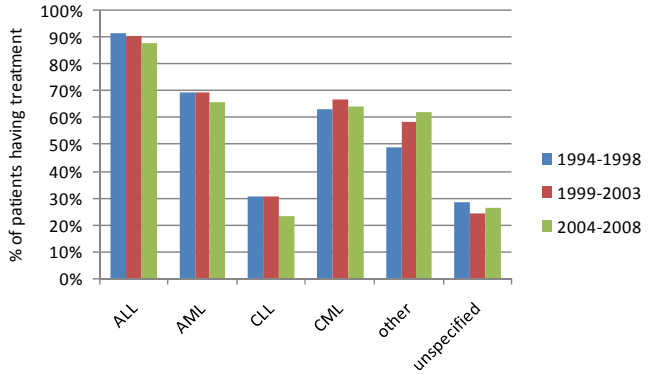


Figure 6. One-, three and five year cause-specific survival by leukaemia type, 1994-2005, with 95% confidence intervals

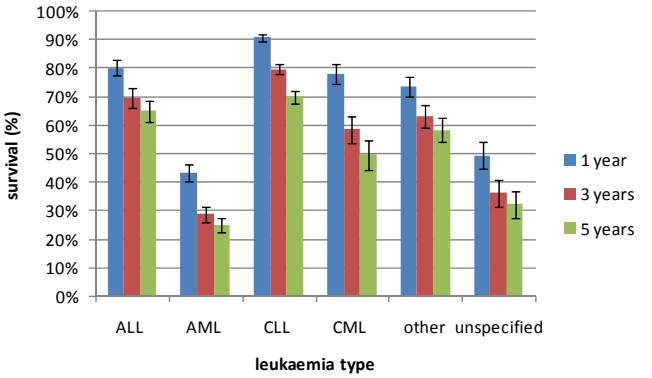


Figure 7. Three year cause-specific survival by leukaemia type and period of diagnosis, 1994-2005, with 95% confidence intervals

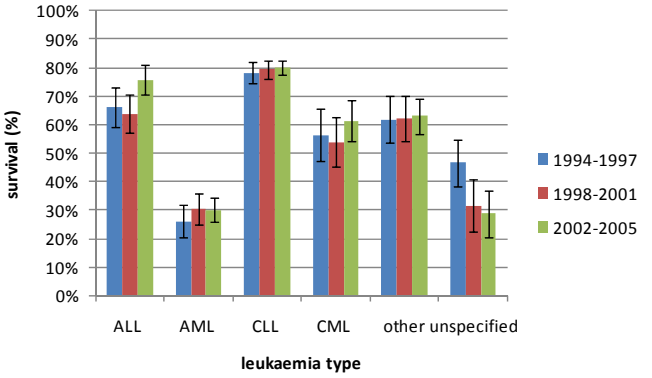
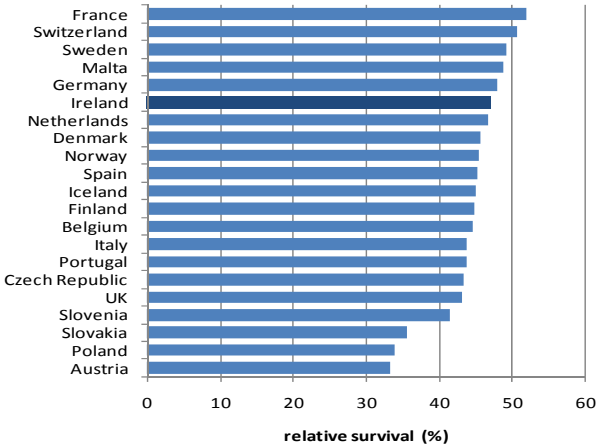


Figure 8. Relative survival for leukaemia diagnosed 1995-1999[2]



1. Figures in brackets are 95% confidence intervals.
2. Source: EUROCARE. www.eurocare.it

Mortality

Between 1950 and 1970 there was a rapid increase in leukaemia mortality, greater in males than females, (Figure 9). Some of this increase may have been due to better diagnosis. Death rates have declined slightly since then, and to a greater extent in females than males. Death rates for children (under 15) were as high as for adults in the 1950s, but fell steeply until the early 1990's, due to major advances in chemotherapy. Death rates in children have remained fairly constant since 1990.

The international variation in leukaemia incidence and death rates is less than for many other cancers (Figure 10). The incidence rate in Ireland is among the highest in Europe, but Irish mortality rates are unexceptional. The death rates in Nordic countries are among the lowest in Europe. The apparently low incidence and mortality rates in Bulgaria and Romania are likely to be due to missed diagnoses and under-registration, but registration is essentially complete in the Nordic countries.

Figure 9. Leukaemia mortality, Ireland 1950-2006 (five-year smoothed average age-standardised rate)

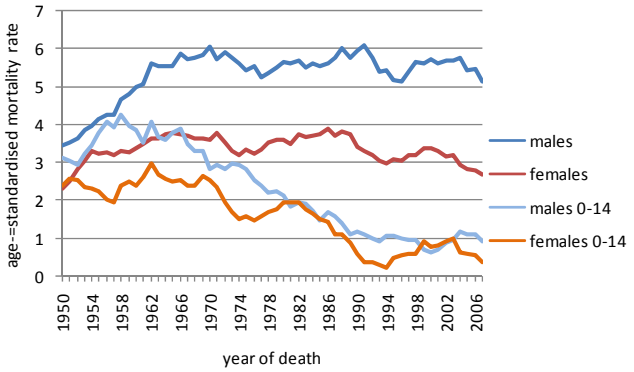
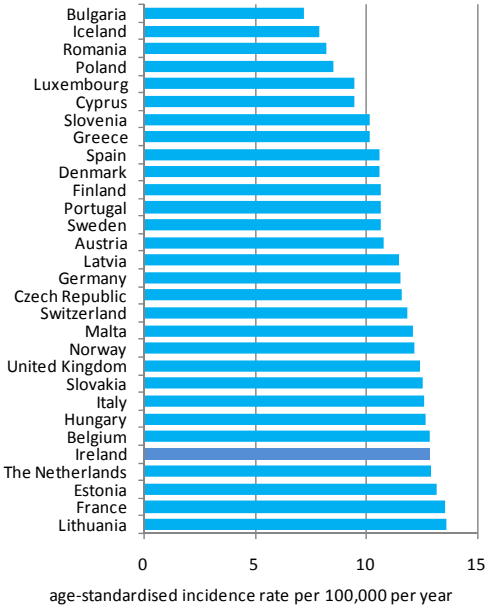


Figure 10. Estimated leukaemia incidence and mortality rates in selected European countries, 2008 (age-standardised to European standard population)

incidence



mortality