

Chapter 24:

Leukaemia (C91-C95)

KEY FINDINGS

INCIDENCE AND MORTALITY

- There were 359 male and 241 female cases diagnosed each year between 2000 and 2004.
- Chronic lymphoblastic leukaemia, the commonest type of leukaemia, made up 39.7% of male and 37.3% of female cases.
- Male incidence rates of leukaemia increased in Ireland by 1.5% each year between 1994 and 2004. Among females there was no significant change.
- North Tipperary, Limerick and Cork all had higher than expected male incidence rates of leukaemia during 1994-2004, while Limerick and Louth had higher than expected incidence rates for females.
- During 2000-2004 there was no relationship between incidence and deprivation.
- Incidence rates during 1998-2000 were average in Northern Ireland compared to the EU for males and were low for females, while in Republic of Ireland incidence rates were higher than in EU for males and females.
- During 2000-2004 there were 206 male and 146 female deaths in Ireland.
- There was no significant change in mortality rates during 1994-2004.

SURVIVAL AND PREVALENCE

- Five-year (age-standardised) relative survival from leukaemia in Ireland was estimated to be 45.6% for males and 49.4% for females diagnosed in 2000-2004.
- There was no significant change in one or five-year (age-standardised) relative survival from leukaemia for males or females between those diagnosed in 1994-1996 and 1997-1999 in Ireland.
- Survival from leukaemia depended upon cancer site for patients diagnosed during 1997-1999 with five-year (age-standardised) relative survival for chronic lymphoblastic leukaemia 70.2% compared to 9.5% for patients diagnosed with acute lymphoblastic leukaemia.
- At the end of 2004 there were 2,651 people living in Ireland who had been diagnosed with leukaemia during 1994-2004.

NORTH/SOUTH COMPARISONS

- Incidence rates were 29.6% lower in Northern Ireland than Republic of Ireland for males and 24.7% lower for females.
- Incidence rates for acute lymphoblastic, acute myeloid and chronic myeloid leukaemias were similar in Northern Ireland and Republic of Ireland. Incidence rates for chronic lymphoblastic leukaemia were 53.5% lower for males and 53.1% lower for females in Northern Ireland.
- Males incidence rates increased in Republic of Ireland by 2.8% per year during 1994-2004, however in Northern Ireland rates were static. Female incidence rates remained static in both countries.
- Five-year (age-standardised) relative survival was estimated to be 11.8% higher in Republic of Ireland than Northern Ireland for persons diagnosed in 2000-2004.
- There was no significant difference between the two countries in five-year (age-standardised) relative survival for any of the four main types of leukaemia.
- During 2000-2004 mortality rates were 29.4% lower in Northern Ireland than Republic of Ireland for males and 30.4% lower for females.
- At the end of 2004 the number of people living with leukaemia per 100,000 persons, having been diagnosed with the disease in the previous five years, was 27.8% lower in Northern Ireland than Republic of Ireland.

24.1: Incidence

Leukaemia made up 3.3% of all male and 2.3% of all female cancers (excluding NMSC) in Ireland during 2000-2004 with 359 male and 241 female cases diagnosed annually. Overall it was the eighth most common male cancer and eleventh most common female cancer. Once adjusted for age European age-standardised incidence rates (EASIRs) were 83.3% higher for males compared to those for females ($p < 0.001$). The cumulative risk of developing the disease before the age of 75 was 1.1% for males and 0.6% for females. (Tab. 24.1)

There was a considerable difference in levels of this cancer between Northern Ireland and Republic of Ireland with European age-standardised incidence rates (EASIR) 29.6% lower in Northern Ireland than Republic of Ireland for males ($p < 0.001$) and 24.7% lower for females ($p < 0.001$). (Tab. 24.1)

Table 24.1: Summary statistics for incidence of leukaemia: 2000-2004

	Northern Ireland			Republic of Ireland			Ireland		
	Male	Female	All persons	Male	Female	All persons	Male	Female	All persons
Number of cases per year	89	66	155	270	175	445	359	241	600
% of all cancer cases (ex. NMSC)	2.7%	1.9%	2.3%	3.5%	2.5%	3.0%	3.3%	2.3%	2.8%
Rank (ex. NMSC)	11	12	14	8	11	9	8	11	10
Median age at diagnosis	67	70	68	66	68	67	66.5	68	67
Cumulative risk (Aged 0 to 74)	0.8%	0.5%	0.6%	1.2%	0.6%	0.9%	1.1%	0.6%	0.8%
Crude rate per 100,000 persons	10.8	7.6	9.2	13.9	8.9	11.4	12.9	8.5	10.7
EASIR \pm 95% CI	10.9 \pm 1.0	6.3 \pm 0.7	8.3 \pm 0.6	15.5 \pm 0.8	8.3 \pm 0.6	11.6 \pm 0.5	14.0 \pm 0.7	7.6 \pm 0.4	10.5 \pm 0.4
% difference (NI vs ROI) \pm 95% CI (+ NI higher, - NI lower)							-29.6% \pm 7.6	-24.7% \pm 10.0	-28.3% \pm 6.0

EASIR: European age-standardised incidence rate per 100,000 persons; CI: Confidence interval

24.1.1: Age distribution

Leukaemia had a median age of diagnosis of 67 years during 2000-2004. Cases were highest among males aged 70-74 and females aged 85 and over with an average of 51 male and 33 female cases each year. Leukaemia was the most common form of childhood cancer with 29 boys and 23 girls diagnosed each year during 2000-2004 which represented 8.0% of male and 9.7% of female leukaemias diagnosed. (Fig. 24.1)

Age-specific incidence rates (ASIR) for children (aged 0-14) were higher than for those aged 20-39. However from the age of 40 onwards ASIRs rose steadily to a maximum among those aged 85 and over.

This pattern was seen in both Northern Ireland and Republic of Ireland; however

ASIRs were considerably higher in Republic of Ireland than Northern Ireland for both males and females during 2000-2004. (Fig. 24.1)

24.1.2: Cancer site

There were four main types of leukaemia diagnosed in Ireland during 2000-2004 with a further percentage of cases being less common forms of the disease. The most common type of leukaemia was chronic lymphoblastic leukaemia, which made up 39.7% of male and 37.3% of female leukaemias, while acute myeloid leukaemia made up approximately one quarter of all leukaemias for both males and females. (Fig. 24.2)

Figure 24.1: Number of cases of leukaemia diagnosed per year by sex and age with age-specific incidence rate (ASIR) per 100,000 persons: 2000-2004

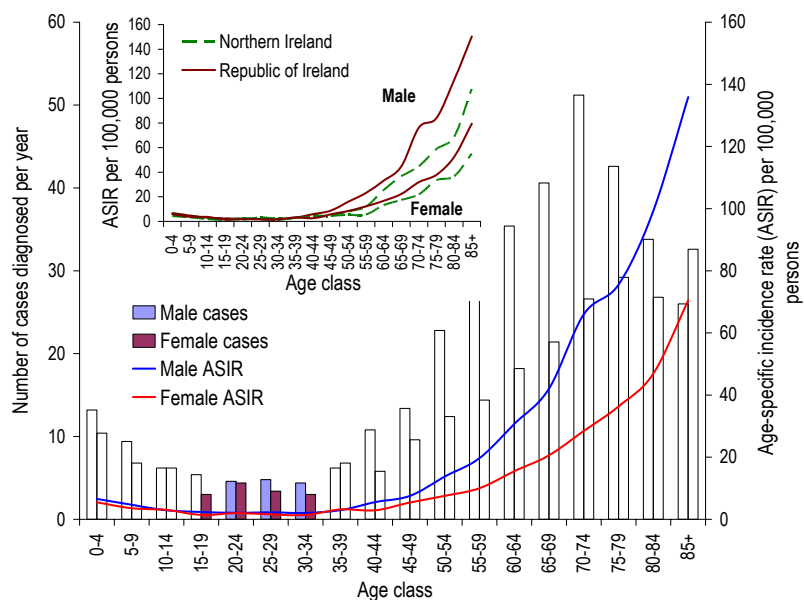
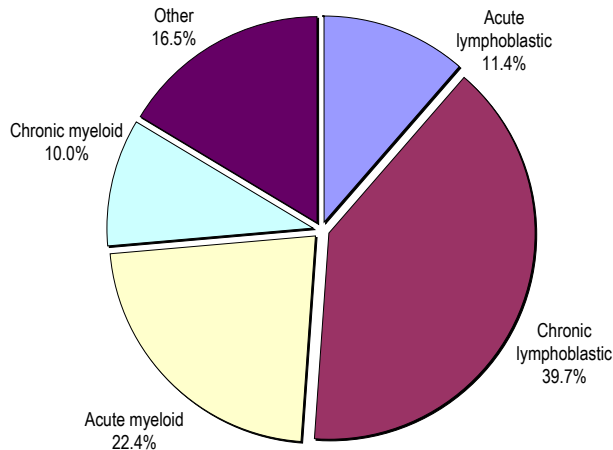
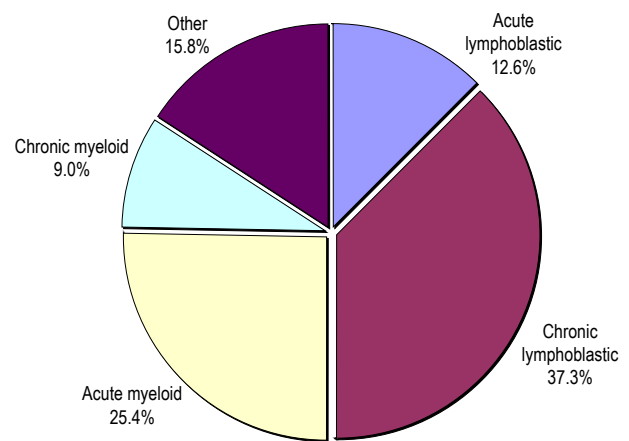


Figure 24.2: Types of leukaemia diagnosed in Ireland: 2000-2004

(a) Male

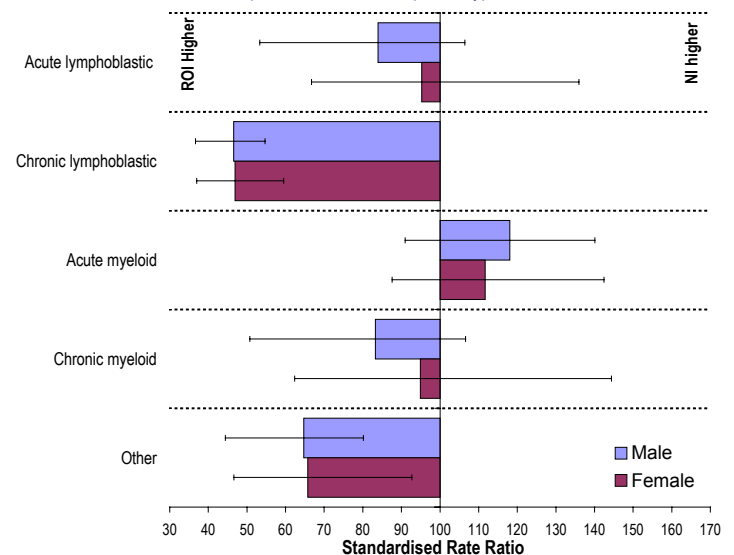


(b) Female



European age-standardised incidence rates (EASIR) of acute lymphoblastic leukaemia, acute myeloid leukaemia and chronic myeloid leukaemia were similar in Northern Ireland and Republic of Ireland. EASIRs for chronic lymphoblastic leukaemia however were 53.5% lower in Northern Ireland than those in Republic of Ireland for males and 53.1% lower for females. Additionally the rarer forms of leukaemia (collected under the “other” category”) were also more common in Republic of Ireland with EASIRs 35.3% lower in Northern Ireland than those in Republic of Ireland for males and 34.3% lower for females. (Fig. 24.3)

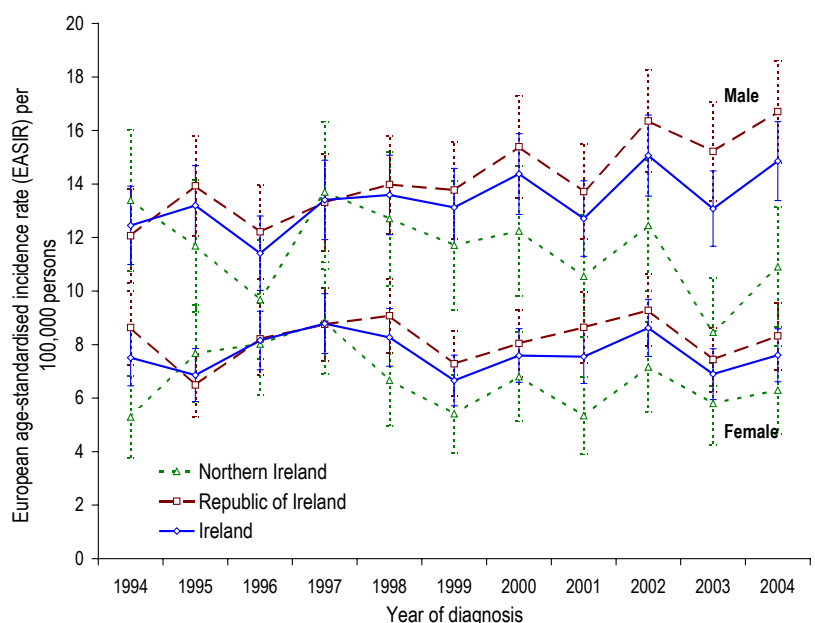
Figure 24.3: Standardised rate ratios comparing European age-standardised rates in Northern Ireland to those in Republic of Ireland for specific types of leukaemia: 2000-2004



24.1.3: Trends

European age-standardised incidence rates (EASIR) of leukaemia increased in Ireland by 1.5% (p=0.040) each year between 1994 and 2004. Among females however there was no significant change in EASIRs. This corresponded to an annual increase of 9.1 male and 2.8 female cases each year as a result of the increasing and ageing population in Ireland. (Fig. 24.4)

Figure 24.4: Trends in European age-standardised incidence rates (EASIR) for leukaemia by sex and country: 1994-2004



The increasing male incidence rates were apparent in Republic of Ireland with an increase in EASIRs of 2.8% (p<0.001), however in Northern Ireland male EASIRs did not change significantly. Female EASIRs remained static in both countries. In terms of the annual change in the number of cases diagnosed, Northern Ireland experienced an annual decrease of 1.3 cases while Republic of Ireland saw an annual increase of 13.2 cases. (Fig. 24.4; Tab. 24.2)

On examination of specific age and sex

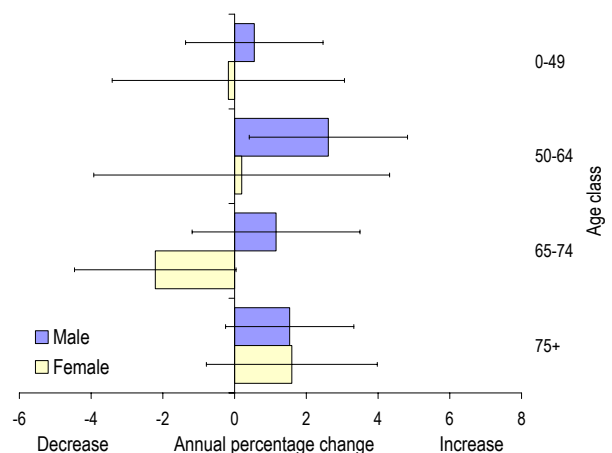
Table 24.2: Number of cases and European age-standardised incidence rates (EASIR) for leukaemia by year of diagnosis, sex and country: 1994-2004

Year	Male						Female					
	Northern Ireland		Republic of Ireland		Ireland		Northern Ireland		Republic of Ireland		Ireland	
	Cases	EASIR	Cases	EASIR	Cases	EASIR	Cases	EASIR	Cases	EASIR	Cases	EASIR
1994	102	13.4 ±2.6	190	12.1 ±1.8	292	12.5 ±1.5	52	5.3 ±1.5	161	8.6 ±1.4	213	7.5 ±1.1
1995	90	11.7 ±2.4	220	13.9 ±1.9	310	13.2 ±1.5	75	7.7 ±1.8	125	6.5 ±1.2	200	6.9 ±1.0
1996	75	9.7 ±2.2	194	12.2 ±1.8	269	11.4 ±1.4	75	8.0 ±1.9	154	8.2 ±1.3	229	8.2 ±1.1
1997	107	13.7 ±2.6	217	13.3 ±1.8	324	13.4 ±1.5	88	8.9 ±1.9	168	8.8 ±1.4	256	8.8 ±1.1
1998	102	12.7 ±2.5	230	14.0 ±1.8	332	13.6 ±1.5	65	6.7 ±1.7	177	9.1 ±1.4	242	8.3 ±1.1
1999	92	11.7 ±2.4	228	13.8 ±1.8	320	13.1 ±1.5	58	5.4 ±1.5	148	7.3 ±1.2	206	6.7 ±0.9
2000	99	12.2 ±2.4	256	15.4 ±1.9	355	14.4 ±1.5	70	6.8 ±1.7	166	8.0 ±1.3	236	7.6 ±1.0
2001	84	10.6 ±2.3	234	13.7 ±1.8	318	12.7 ±1.4	59	5.3 ±1.4	176	8.6 ±1.3	235	7.5 ±1.0
2002	101	12.5 ±2.5	287	16.4 ±1.9	388	15.1 ±1.5	79	7.2 ±1.7	194	9.3 ±1.3	273	8.6 ±1.1
2003	69	8.5 ±2.0	270	15.2 ±1.8	339	13.1 ±1.4	59	5.8 ±1.5	158	7.4 ±1.2	217	6.9 ±0.9
2004	93	10.9 ±2.2	303	16.7 ±1.9	396	14.9 ±1.5	64	6.3 ±1.6	180	8.3 ±1.3	244	7.6 ±1.0

EASIR: European age-standardised incidence rate per 100,000 persons with 95% confidence interval

groups, significant changes in EASIRs were observed only for the male 50-64 age class, with an annual increase of 2.6% (p=0.025) during 1994-2004. However while not statistically significant there was also some weak evidence for a decrease in EASIRs for females aged 65-74 (p=0.058) and of an increase in EASIRs among males aged 75 and over (p=0.084). (Fig. 24.5)

Figure 24.5: Annual percentage change (APC) in European age-standardised incidence rates (EASIR) for leukaemia by sex and age: 1994-2004

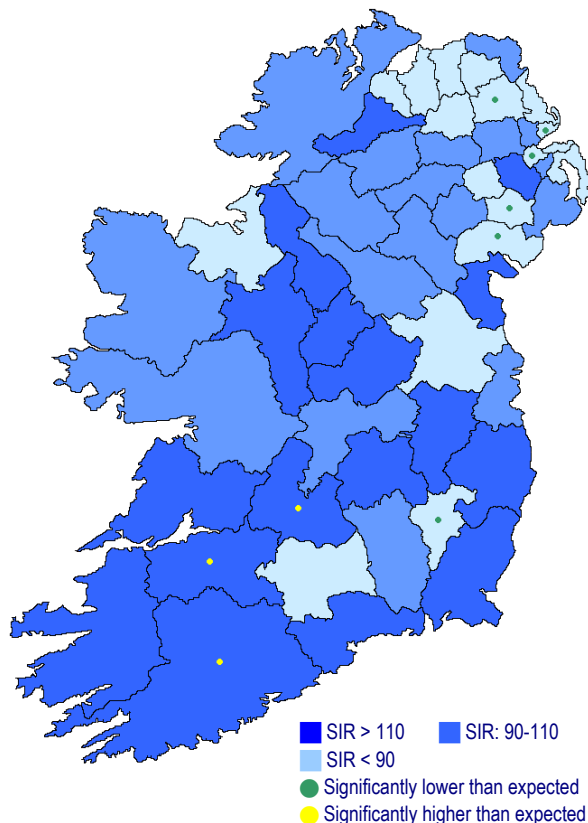


24.1.4: Geographic variations

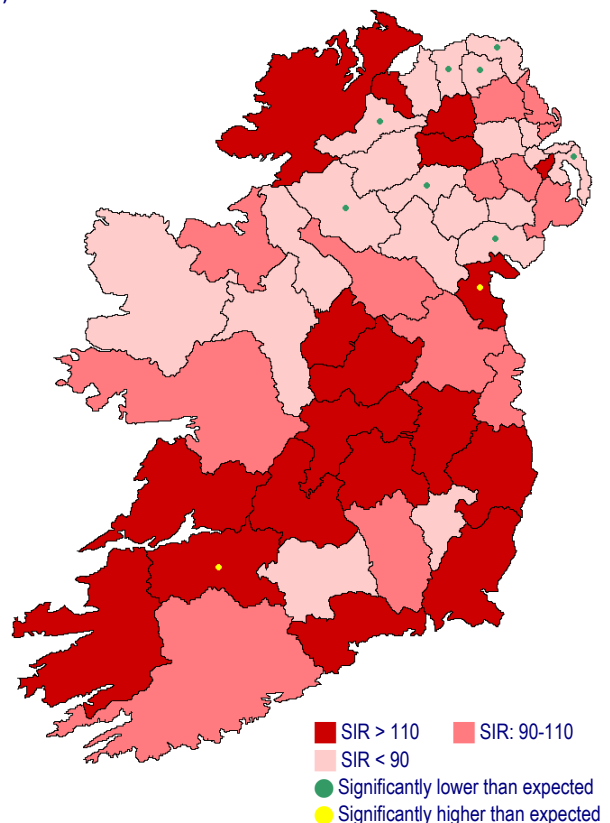
North Tipperary, Limerick and Cork all had higher than expected male incidence rates of leukaemia (compared to Ireland as a whole) during 1994-2004, while Limerick and Louth had higher than expected incidence rates for females.

Figure 24.6: Significant differences in county/council standardised incidence ratios for leukaemia compared to Ireland as a whole: 1994-2004

(a) Male



(b) Female

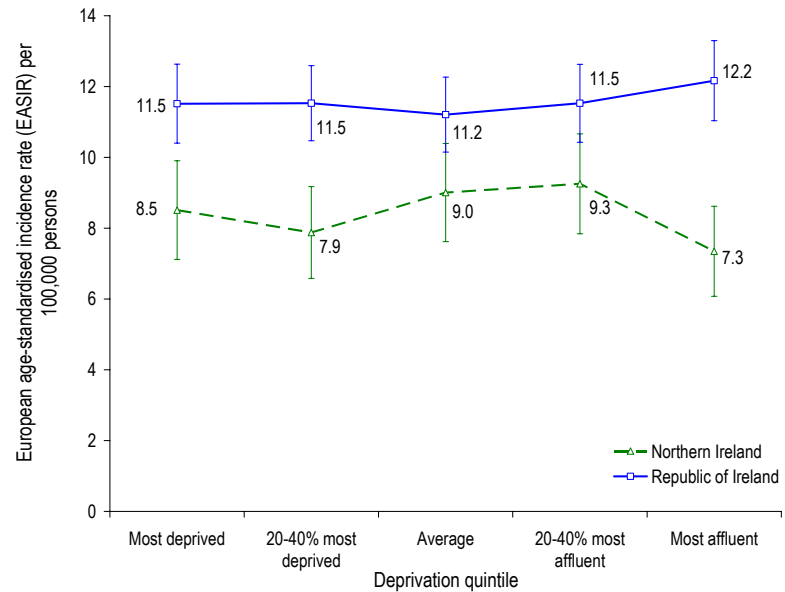


There were six councils/counties with lower than expected rates of the disease among males compared to eight for females. With the exception of Carlow for males these were all located in Northern Ireland. There were on average 15 male and 13 female cases of the disease diagnosed each year in Belfast and 53 male and 44 female cases diagnosed each year in Dublin. (Fig. 24.6)

24.1.5: Socio-economic factors

During 2000-2004 there was no apparent relationship between incidence of leukaemia and deprivation in either Northern Ireland or Republic of Ireland. Due to the higher rates of leukaemia in Republic of Ireland compared to Northern Ireland European age-standardised incidence rates (EASIR) in all deprivation quintiles were significantly higher in Republic of Ireland than the equivalent population in Northern Ireland (measured using standardised rate ratios) with the difference highest among the 20% most affluent (40.0%; $p < 0.001$). (Fig. 24.7)

Figure 24.7: European age-standardised incidence rates (EASIR) for leukaemia by country specific deprivation quintile: 2000-2004

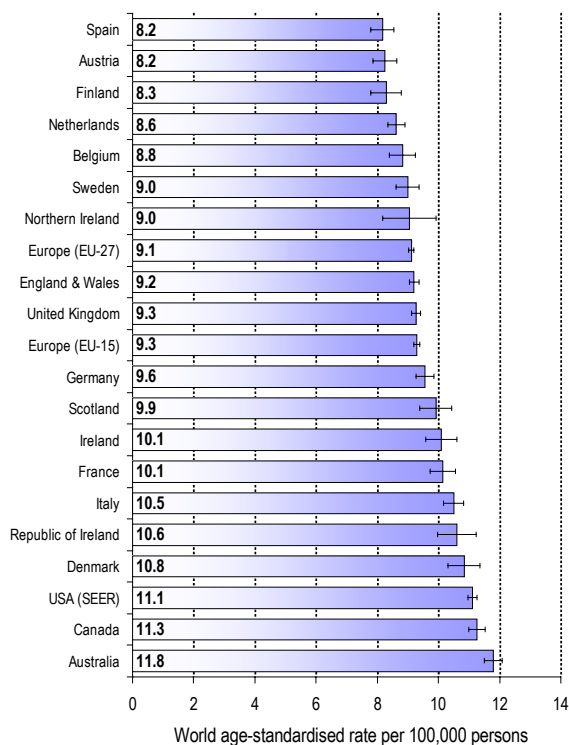


24.1.6: International comparisons

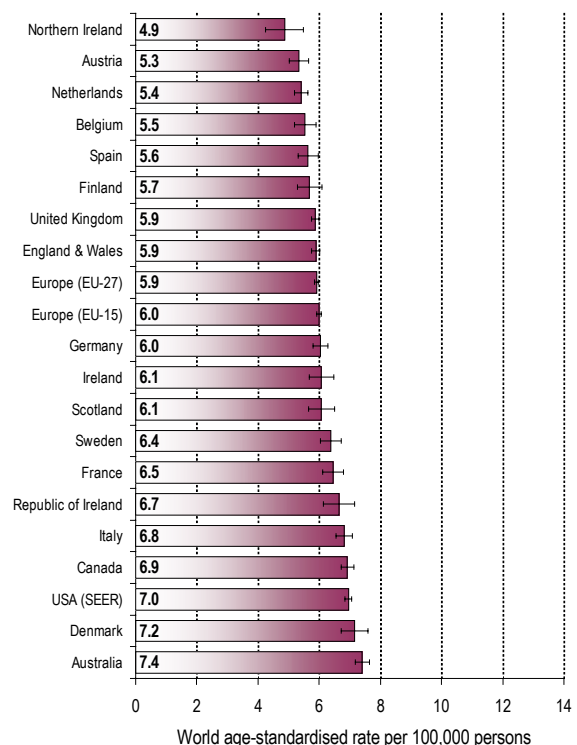
World age-standardised incidence rates (WASIR) of leukaemia in Northern Ireland were similar to those in the European Union for males and were some of the lowest among developed countries for females. Republic of Ireland however had high rates of the disease compared to other developed countries with WASIRs significantly higher than those in European Union and UK, but similar to those in USA for both males and females. (Fig. 24.8)

Figure 24.8: International comparisons of world age-standardised incidence rates for leukaemia: 1998-2000

(a) Male



(b) Female



Source: IARC¹⁹¹

24.2: Survival

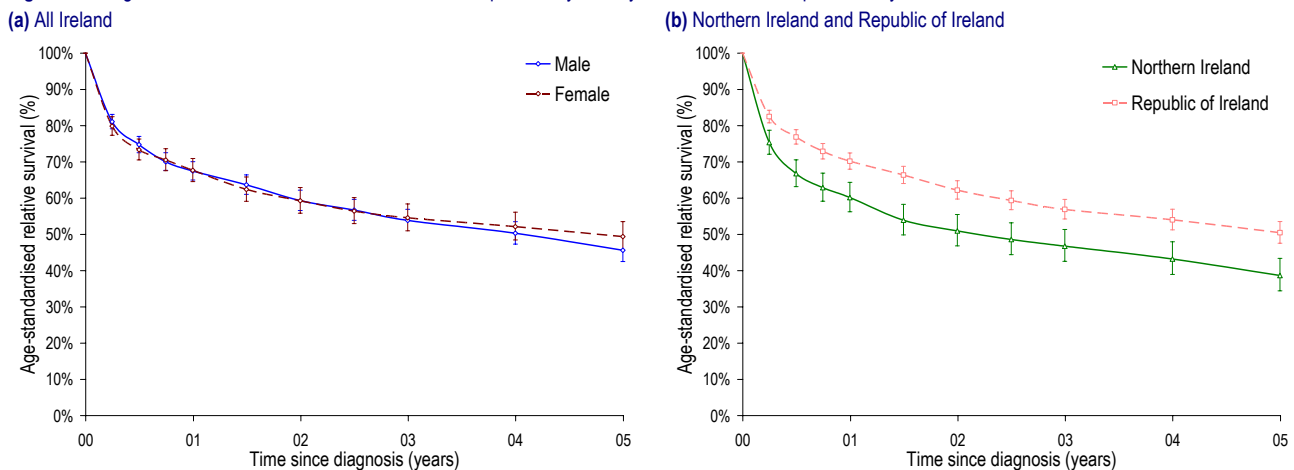
Five-year (age-standardised) relative survival from leukaemia in Ireland was estimated to be 45.6% for males and 49.4% for females diagnosed in 2000-2004. The variation by sex was not statistically significant in Ireland as a whole or in Northern Ireland or Republic of Ireland separately. (Fig. 24.9, Tab. 24.3)

Table 24.3: Age-standardised relative survival for leukaemia patients by country and sex: 2000-2004 period analysis estimates

		Age-standardised relative survival (95% CI)		
		Male	Female	All
1-year	Northern Ireland	60.9% (56.0%, 66.2%)	59.2% (52.9%, 66.2%)	60.2% (56.3%, 64.4%)
	Republic of Ireland	69.8% (66.9%, 72.7%)	70.7% (67.2%, 74.5%)	70.2% (68.0%, 72.5%)
	Ireland	67.5% (65.0%, 70.1%)	67.7% (64.6%, 70.9%)	67.6% (65.7%, 69.6%)
5-year	Northern Ireland	38.8% (33.3%, 45.1%)	39.5% (33.0%, 47.3%)	38.7% (34.4%, 43.4%)
	Republic of Ireland	47.9% (44.2%, 51.9%)	53.6% (49.1%, 58.6%)	50.5% (47.6%, 53.5%)
	Ireland	45.6% (42.5%, 49.0%)	49.4% (45.6%, 53.5%)	47.3% (44.8%, 49.8%)

Five-year (age-standardised) relative survival was significantly higher in Republic of Ireland than Northern Ireland for all persons (11.8%, $p=0.002$) and for females (14.1%, $p=0.020$) with a 9.1% ($p=0.066$) difference for males that did not reach statistical significance. These differences are however likely to be linked to the higher proportion of chronic lymphoblastic leukaemia cases diagnosed in Republic of Ireland. (Fig. 24.9, Tab. 24.3)

Figure 24.9: Age-standardised relative survival for leukaemia patients by country and sex: 2000-2004 period analysis estimates



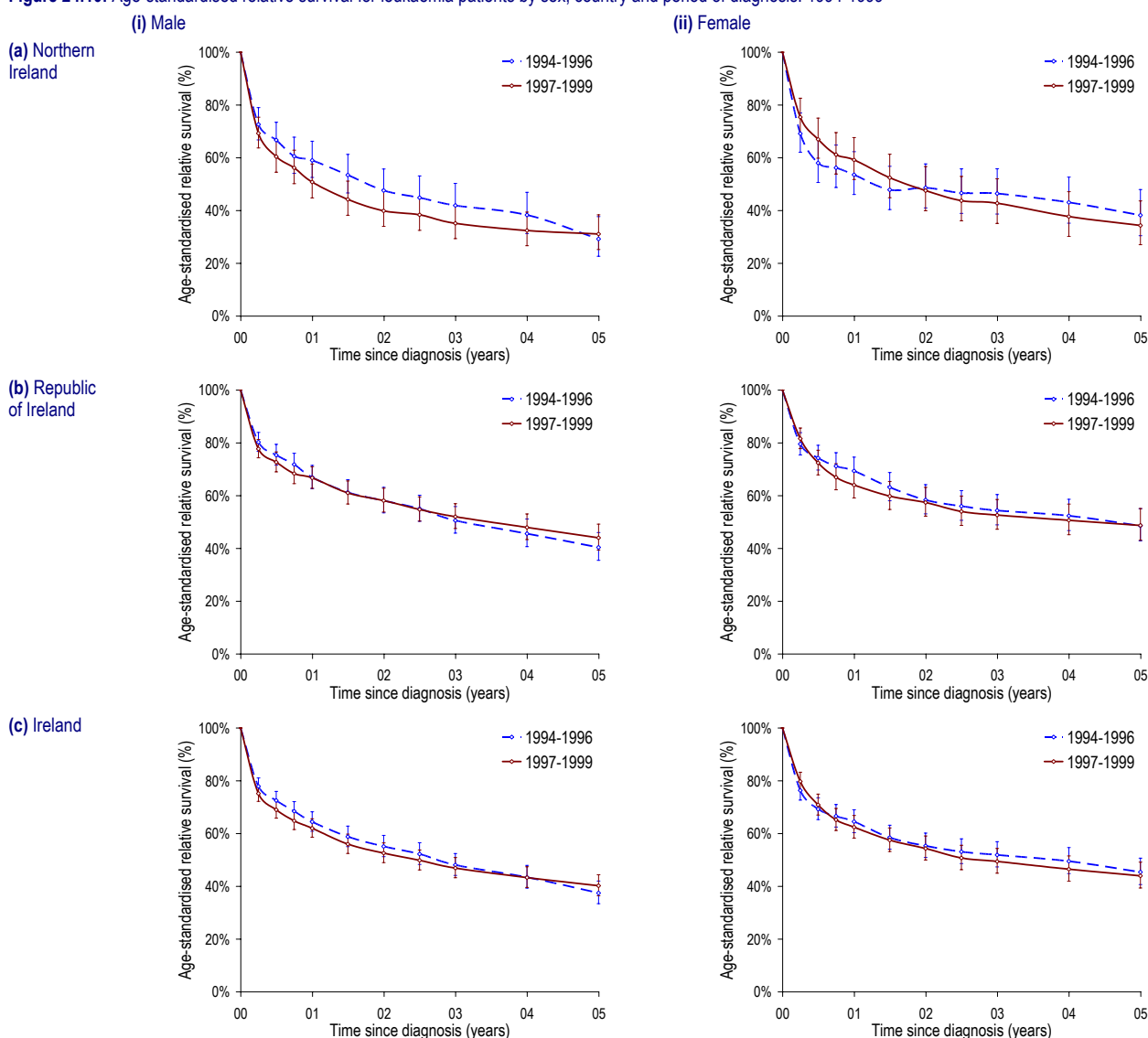
24.2.1: Changes in survival over time

There was no significant variation in one- or five-year (age-standardised) relative survival from leukaemia for males or females between those diagnosed in 1994-1996 and 1997-1999 in Ireland or in Northern Ireland and Republic of Ireland considered separately. (Fig. 24.10, Tab. 24.4)

Table 24.4: Age-standardised relative survival for leukaemia patients by sex, country and period of diagnosis: 1994-1999

		Age-standardised relative survival (95% CI)			
		1-year		5-year	
		1994-1996	1997-1999	1994-1996	1997-1999
All persons	Northern Ireland	56.3% (51.2%, 61.9%)	54.2% (49.5%, 59.5%)	33.4% (28.2%, 39.6%)	32.5% (27.8%, 37.9%)
	Republic of Ireland	68.3% (65.1%, 71.6%)	65.7% (62.6%, 69.0%)	44.4% (40.6%, 48.5%)	46.1% (42.4%, 50.1%)
	Ireland	64.8% (62.1%, 67.7%)	62.2% (59.6%, 65.0%)	41.3% (38.2%, 44.7%)	41.8% (38.9%, 45.0%)
Male	Northern Ireland	59.0% (52.5%, 66.3%)	50.8% (44.8%, 57.7%)	29.2% (22.7%, 37.7%)	31.1% (25.2%, 38.4%)
	Republic of Ireland	66.9% (62.7%, 71.5%)	66.8% (62.8%, 71.0%)	40.4% (35.5%, 46.0%)	44.0% (39.4%, 49.2%)
	Ireland	64.5% (60.9%, 68.2%)	62.0% (58.6%, 65.6%)	37.5% (33.4%, 42.0%)	40.2% (36.4%, 44.4%)
Female	Northern Ireland	53.6% (46.1%, 62.3%)	59.2% (51.8%, 67.7%)	38.2% (30.5%, 48.0%)	34.4% (27.0%, 43.7%)
	Republic of Ireland	69.4% (64.5%, 74.6%)	64.1% (59.1%, 69.4%)	48.6% (42.9%, 55.1%)	48.7% (43.1%, 55.2%)
	Ireland	64.5% (60.3%, 69.0%)	62.4% (58.3%, 66.9%)	45.4% (40.7%, 50.7%)	44.0% (39.4%, 49.2%)

Figure 24.10: Age-standardised relative survival for leukaemia patients by sex, country and period of diagnosis: 1994-1999



24.2.2: Observed survival

Observed survival includes causes of death other than cancer and represents survival actually experienced by those diagnosed with cancer. Of those diagnosed in Ireland with leukaemia during 1997-1999 35.2% survived a minimum of five-years. There was no significant variation in observed survival by sex or by period of diagnosis. As with relative survival however five-year observed survival was 13.0% (p=0.006) higher for males and 14.6% (p=0.010) higher for females in Republic of Ireland than in Northern Ireland. (Tab. 24.5)

Table 24.5: Observed survival for leukaemia patients by sex, country and period of diagnosis: 1994-1999

		Observed survival (95% CI)			
		1-year		5-year	
		1994-1996	1997-1999	1994-1996	1997-1999
All persons	Northern Ireland	54.0% (49.3%, 59.2%)	52.3% (47.8%, 57.2%)	27.9% (23.8%, 32.8%)	25.7% (21.9%, 30.1%)
	Republic of Ireland	65.3% (62.3%, 68.5%)	63.7% (60.7%, 66.7%)	36.1% (33.1%, 39.3%)	39.4% (36.4%, 42.5%)
	Ireland	62.0% (59.4%, 64.7%)	60.2% (57.7%, 62.8%)	33.6% (31.2%, 36.3%)	35.2% (32.8%, 37.7%)
Male	Northern Ireland	54.6% (48.4%, 61.6%)	49.4% (43.7%, 55.9%)	24.3% (19.2%, 30.7%)	24.9% (20.1%, 30.8%)
	Republic of Ireland	63.7% (59.8%, 67.9%)	64.8% (61.1%, 68.8%)	32.1% (28.4%, 36.4%)	37.9% (34.2%, 42.1%)
	Ireland	61.1% (57.7%, 64.7%)	60.1% (56.9%, 63.5%)	29.9% (26.8%, 33.3%)	33.9% (30.9%, 37.3%)
Female	Northern Ireland	53.3% (46.2%, 61.3%)	56.3% (49.5%, 64.0%)	32.5% (26.2%, 40.4%)	26.8% (21.1%, 34.0%)
	Republic of Ireland	67.6% (63.1%, 72.5%)	62.0% (57.5%, 66.9%)	41.6% (37.0%, 46.9%)	41.4% (36.9%, 46.5%)
	Ireland	63.2% (59.3%, 67.4%)	60.2% (56.4%, 64.3%)	38.8% (34.9%, 43.1%)	36.9% (33.2%, 41.0%)

24.2.3: Cancer site

Survival from leukaemia depended upon cancer site for patients diagnosed during 1997-1999 with five-year (age-standardised) relative survival for chronic lymphoblastic leukaemia 70.2% compared to 9.5% for patients diagnosed with acute lymphoblastic leukaemia. (Fig. 24.11)

There was no change in five-year (age-standardised) relative survival for any type of leukaemia between 1994-1996 and 1997-1999. There was no significant difference in five-year (age-standardised) relative survival between Northern Ireland and Republic of Ireland for each of the different types of leukaemia, despite some apparently large differences. Thus the higher survival for patients with leukaemia in Republic of Ireland compared to Northern Ireland was a factor of the higher proportion of chronic lymphoblastic leukaemia, which had the highest survival among the different types of leukaemia. (Tab. 24.6)

Figure 24.11: Age-standardised relative survival for leukaemia patients by cancer site: 1997-1999

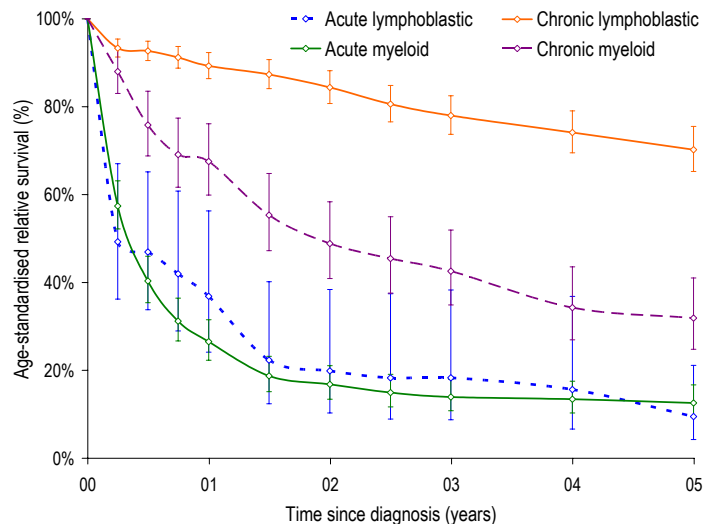
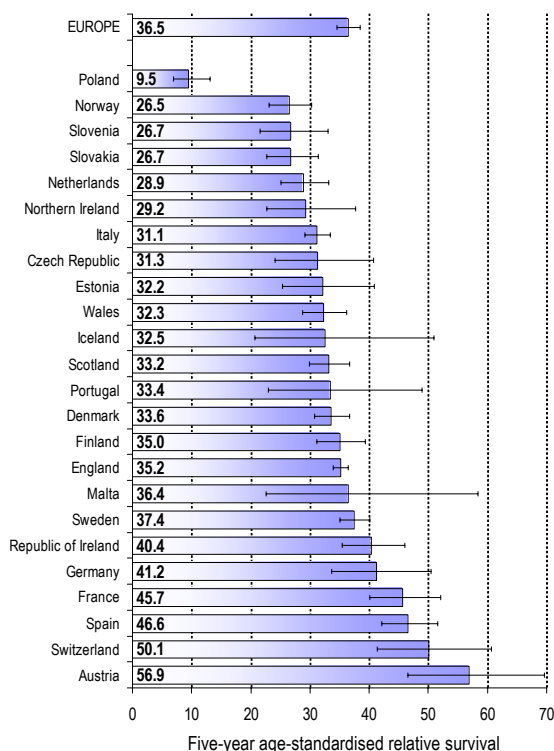


Table 24.6: Five-year age-standardised relative survival for leukaemia patients by cancer site and period of diagnosis: 1994-1999

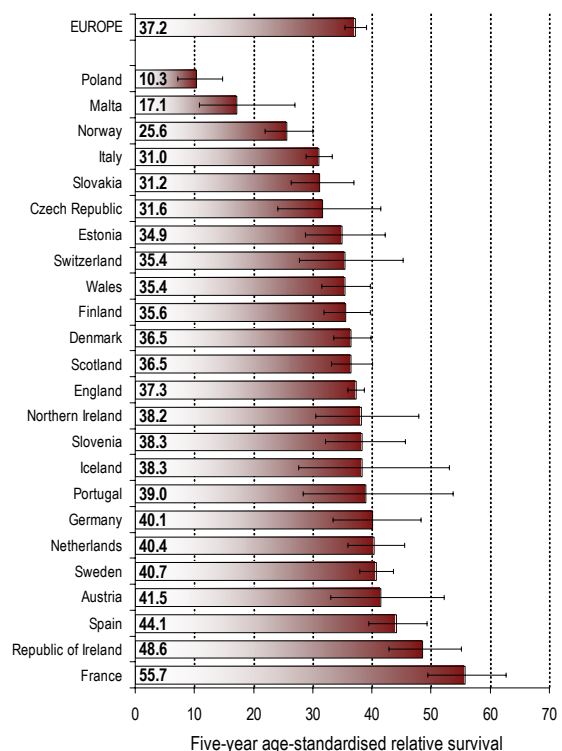
	Five-year age-standardised relative survival (95% CI)					
	Northern Ireland		Republic of Ireland		Ireland	
	1994-1996	1997-1999	1994-1996	1997-1999	1994-1996	1997-1999
Acute lymphoblastic	14.2% (6.8%, 29.5%)	3.5% (1.2%, 9.8%)	13.9% (6.0%, 31.8%)	12.1% (4.7%, 31.3%)	14.1% (7.6%, 26.1%)	9.5% (4.3%, 21.1%)
Chronic lymphoblastic	69.5% (59.7%, 80.9%)	68.6% (59.9%, 78.7%)	64.9% (58.7%, 71.8%)	71.4% (65.7%, 77.6%)	66.5% (61.2%, 72.2%)	70.2% (65.3%, 75.5%)
Acute myeloid	7.8% (3.7%, 16.1%)	8.2% (4.4%, 15.3%)	13.0% (8.3%, 20.2%)	14.6% (10.3%, 20.7%)	10.2% (7.0%, 14.8%)	12.6% (9.5%, 16.7%)
Chronic myeloid	19.3% (10.3%, 36.1%)	40.3% (31.0%, 52.5%)	37.3% (26.4%, 52.6%)	28.7% (20.3%, 40.7%)	27.0% (19.6%, 37.2%)	31.9% (24.8%, 41.0%)
Other leukaemia	22.5% (13.2%, 38.3%)	20.5% (13.5%, 31.1%)	39.7% (32.6%, 48.3%)	33.8% (27.5%, 41.7%)	36.4% (30.3%, 43.7%)	30.3% (25.1%, 36.6%)

Figure 24.12: European comparisons of five-year age-standardised relative survival for leukaemia patients: 1990-1994 (EUROCORE III), 1994-1996 (NI & ROI)

(a) Male



(b) Female



Source: EUROCORE-III¹⁹²

24.2.4: European comparisons

There was considerable variation in five-year (age-standardised) relative survival from leukaemia between the countries included in the EURO CARE-III study which reported on patients diagnosed in 1990-1994. This was likely due to a different mix of types of leukaemia diagnosed in each country, which can have a significant impact on patient survival. The European average for males was 36.5%, while for females it was 37.2%. For patients diagnosed in Northern Ireland and Republic of Ireland in 1994-1996 with leukaemia, there was no significant difference from the European average, except for females in Republic of Ireland, whose survival was significantly above the European average. (Fig. 24.12)

24.3: Mortality

During 2000-2004 there were 206 male and 146 female deaths from leukaemia in Ireland. It was the seventh most common cause of death due to cancer among males contributing 3.5% of all male deaths from cancer (excluding NMSC), with a risk of dying from the disease before age 75 of 1 in 192. Among females it was the ninth most common cause of death from cancer contributing 2.7% of all female deaths from cancer (excluding NMSC), with a risk of dying from the disease before age 75 of 1 in 367. (Tab. 24.7)

European age-standardised mortality rates (EASMR) were 92.9% higher among males than females, a difference found in both Northern Ireland and Republic of Ireland. During 2000-2004 EASMRs were 29.4% lower in Northern Ireland than Republic of Ireland for males and 30.4% lower for females. (Tab. 24.7)

Table 24.7: Summary statistics for deaths from leukaemia: 2000-2004

	Northern Ireland			Republic of Ireland			Ireland		
	Male	Female	All persons	Male	Female	All persons	Male	Female	All persons
Number of deaths per year	52	39	90	155	107	262	206	146	352
% of all cancer deaths (ex. NMSC)	2.7%	2.2%	2.5%	3.8%	3.0%	3.4%	3.5%	2.7%	3.1%
Rank (ex. NMSC)	10	10	10	7	9	8	7	9	10
Median age at death	71	76	74	74	76	74	73	76	74
Cumulative risk (Aged 0 to 74)	0.4%	0.2%	0.3%	0.6%	0.3%	0.4%	0.5%	0.3%	0.4%
Crude rate per 100,000 persons	6.2	4.5	5.3	7.9	5.4	6.7	7.4	5.1	6.3
EASMR \pm 95% CI	6.3 \pm 0.8	3.2 \pm 0.5	4.5 \pm 0.4	8.9 \pm 0.6	4.7 \pm 0.4	6.5 \pm 0.4	8.0 \pm 0.5	4.2 \pm 0.3	5.8 \pm 0.3
% difference (NI vs ROI) \pm 95% CI (+ NI higher, - NI lower)							-29.4% \pm 10.1	-30.4% \pm 12.1	-30.3% \pm 7.6

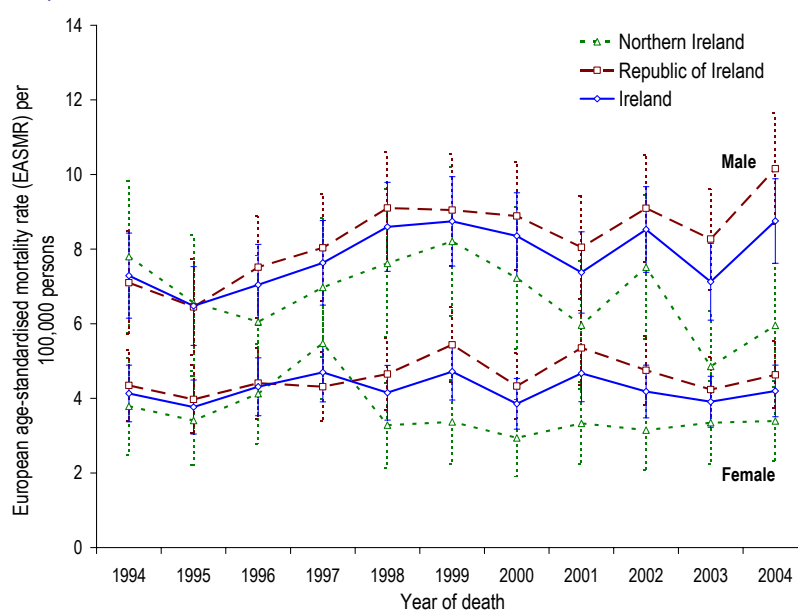
EASMR: European age-standardised mortality rate per 100,000 persons; CI: Confidence interval

24.3.1: Trends

In Ireland there was no significant trend for males or females during 1994-2004 in European age-standardised mortality rates (EASMR) for leukaemia. However the absolute number of deaths increased by 6.0 male and 2.9 female deaths per year as a result of the changing size and age structure of the population. (Fig. 24.13)

In Northern Ireland there was no significant change in EASMRs for either males or females, nor were there any conclusive changes for females in Republic of Ireland. However male EASMRs for leukaemia increased by 3.0% ($p=0.007$) per year in Republic of Ireland during 1994-2004. (Fig. 24.13)

Figure 24.13: Trends in European age-standardised mortality rates (EASMR) for leukaemia by sex and country: 1994-2004



24.4: Prevalence

At the end of 2004 there were 2,651 people living in Ireland who had been diagnosed with leukaemia during 1994-2004, 42.8% of leukaemia patients diagnosed during this period. The majority of these (1,675 people) were diagnosed in 2000-2004, 55.8% of all those diagnosed within these five years. (Tab. 24.8)

The majority of those alive at the end of 2004 and diagnosed within the

previous five years were male (1,016 males compared to 659 females) while 392 survivors were resident in Northern Ireland compared to 1,283 in Republic of Ireland. At the end of 2004 the number of people living with leukaemia per 100,000 persons, who were diagnosed during 2000-2004, was 27.8% lower in Northern Ireland than Republic of Ireland. (Tab. 24.8)

Table 24.8: Prevalence of leukaemia in Ireland at the end of 2004 by country, sex and period of diagnosis

		Diagnosed 1994-2004		Diagnosed 2000-2004	
		Prevalence	% of cases diagnosed during period	Prevalence	% of cases diagnosed during period
Northern Ireland	Male	366	36.1%	225	50.4%
	Female	279	37.5%	167	50.5%
	All persons	645	36.7%	392	50.5%
Republic of Ireland	Male	1,177	44.8%	791	58.6%
	Female	829	45.9%	492	56.3%
	All persons	2,006	45.2%	1,283	57.7%
Ireland	Male	1,543	42.4%	1,016	56.6%
	Female	1,108	43.4%	659	54.7%
	All persons	2,651	42.8%	1,675	55.8%

24.5: Discussion

Leukaemia refers to a group of diseases where white blood cells or their precursor cells multiply out of control preventing the bone marrow producing other essential cells such as red blood cells, platelets and normal white blood cells. There are several types of leukaemia with the most common being acute lymphoblastic, chronic lymphocytic, acute myeloid and chronic myeloid leukaemias. There are a wide range of symptoms, most of which are common between the different types. Examples include fatigue, weight loss, fever, breathlessness, frequent or persistent infections, bruising, bleeding from gums, bone pain, headaches and visual disturbances, abdominal discomfort or blood in the urine or stool.¹⁹³⁻¹⁹⁵

Exposure to high level of radiation¹⁹⁶ or benzene¹⁹⁷ increases the risk of developing acute leukaemia and chronic myeloid leukaemia. Smokers also have a higher risk of developing various forms of leukaemia with the association strongest for chronic myeloid leukaemia.¹⁹⁸ Other factors which increase risk include previous chemotherapy, blood disorders such as aplastic anaemia and myelodysplastic syndrome, inherited conditions such as Downs syndrome and infections such as human T-cell leukaemia virus.¹⁹⁹⁻²⁰¹ Little else is known about the causes of leukaemia although a possible risk factor is family history which may increase the risk of developing leukaemia by a small amount.²⁰²

Globally there are approximately 250,000 cases of leukaemia diagnosed each year, 3% of all cancer cases, while there are 195,000 deaths from the disease annually. Incidence of the disease is higher in developed countries with incidence rates in African and Asian countries particularly low. Incidence rates are however stable or increasing very slowly. Despite this mortality rates have fallen since the 1960s as a result of treatment advances and survival improvements, although these are difficult to detect in Ireland due to data only being available since 1994.

The lack of understanding of the causes of leukaemia is a major hindrance to the development of prevention strategies for this disease although the link with ionising radiation warrants precautions being taken with regard to the presence of ionising radiation in the environment. These are already in place in Ireland and studies have been undertaken with regard to the possible link between cancers linked with ionising radiation and possible radioactivity from the Irish Sea. None have demonstrated a definite link and high incidence of leukaemia in Ireland thus remains unexplained.

Chemotherapy is the main treatment approach and has proven very effective for certain types of leukaemia such as chronic lymphocytic leukaemia. Other forms of leukaemia have very poor survival, however new types of treatment are continuously being developed. Some newer drugs for the treatment of chronic myeloid leukaemia have the potential to improve survival over the next decade.