

## Chapter 18:

# Testicular cancer (c62)

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### KEY FINDINGS

#### - INCIDENCE AND MORTALITY

- Between 2000 and 2004 there were 189 males diagnosed with testicular cancer each year.
- Unlike most cancers testicular cancer is a disease found mostly in younger males with a median age at diagnosis during 2000-2004 of 32 years.
- Incidence rates of testicular cancer increased between 1994 and 2004 by 3.6% per year.
- Cork and Derry had significantly higher levels of testicular cancer during 1994-2004 than Ireland as a whole.
- Incidence rates of testicular cancer in Ireland were similar during 1998-2000 to the rest of the European Union, but were higher than those in USA and Canada.
- There were 9 deaths per year from the disease between 2000 and 2004
- Between 1994 and 2004 mortality rates decreased by 5.1% per year.

#### - SURVIVAL AND PREVALENCE

- Survival was excellent with an estimated 97.7% of patients diagnosed in 2000-2004 surviving one-year and 96.9% surviving five-years.
- There was no significant change in survival between 1994-1996 and 1997-1999.
- At the end of 2004 there were 1,676 people living in Ireland who had been diagnosed with testicular cancer in the 1994-2004.

#### - NORTH/SOUTH COMPARISONS

- Incidence rates of testicular cancer were 17.2% higher in Northern Ireland than Republic of Ireland during 2000-2004.
  - In Republic of Ireland incidence rates increased by 3.9% per year compared to 3.3% per year in Northern Ireland.
  - There was no variation in survival between Northern Ireland and Republic of Ireland.
  - There was no variation in mortality rates between Northern Ireland and Republic of Ireland.
  - The number of people alive per 100,000 people at the end of 2004 who had been diagnosed with testicular cancer in the previous five years was 10.0% higher in Northern Ireland than Republic of Ireland.
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## 18.1: Incidence

Between 2000 and 2004 there were 189 males diagnosed each year in Ireland with testicular cancer with 128 of these people resident in Republic of Ireland. Testicular cancer was one of the less common cancers making up 1.7% of male cancers (excluding NMSC) during the period thereby ranking it as the fourteenth most common male cancer. The risk of developing the disease before the age of 75 was 0.5%. (Tab.18.1)

European age standardised incidence rates (EASIR) were 17.2% higher in Northern Ireland than Republic of Ireland during 2000-2004 (p=0.036). (Tab. 18.1)

**Table 18.1:** Summary statistics for incidence of testicular cancer: 2000-2004

	Northern Ireland	Republic of Ireland	Ireland
<b>Number of cases per year</b>	60	128	189
<b>% of all cancer cases (ex. NMSC)</b>	1.8%	1.7%	1.7%
<b>Rank (ex. NMSC)</b>	14	14	14
<b>Median age at diagnosis</b>	35	31	32
<b>Cumulative risk (Aged 0 to 74)</b>	0.5%	0.4%	0.5%
<b>Crude rate per 100,000 persons</b>	7.3	6.6	6.8
<b>EASIR ± 95% CI</b>	7.2 ±0.8	6.2 ±0.5	6.5 ±0.4
<b>% difference (NI vs ROI) ± 95%CI (+ NI higher, - NI lower)</b>			17.2% ±16.2

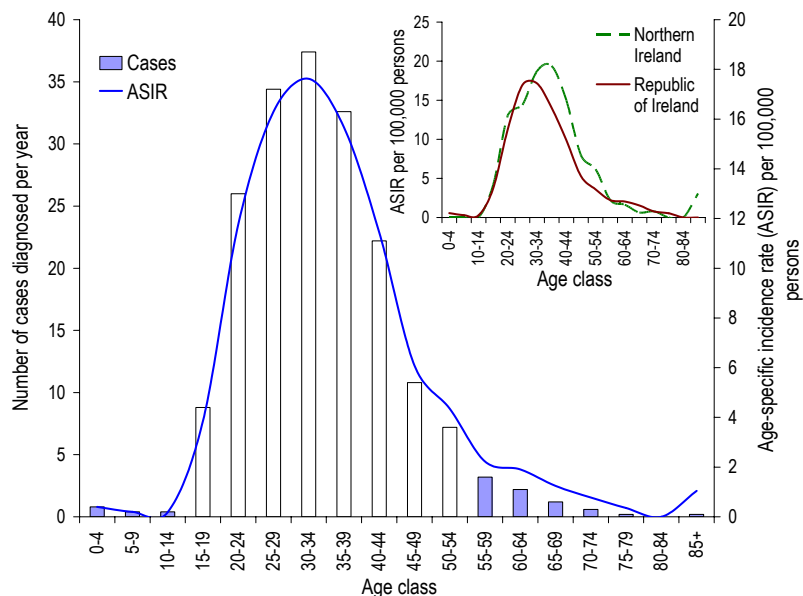
EASIR: European age-standardised incidence rate per 100,000 persons; CI: Confidence interval

### 18.1.1: Age distribution

Unlike most cancers testicular cancer is a disease found mostly in younger males with a median age at diagnosis during 2000-2004 of 32 years. This however varied between Northern Ireland and Republic of Ireland with diagnosis on average four years younger in the later. (Tab. 18.1)

For males incidence of testicular cancer peaked in the 30-34 age class with 37 cases per year (19.8% of male cases). Age-specific incidence rates (ASIR) were also highest in this age class with 17.6 cases per 100,000 males aged 30-34. The age distribution varied by country with male ASIRs highest in Northern Ireland among those aged 35-39. (Fig. 18.1)

**Figure 18.1:** Number of cases of testicular cancer diagnosed per year by age with age-specific incidence rate (ASIR) per 100,000 persons: 2000-2004

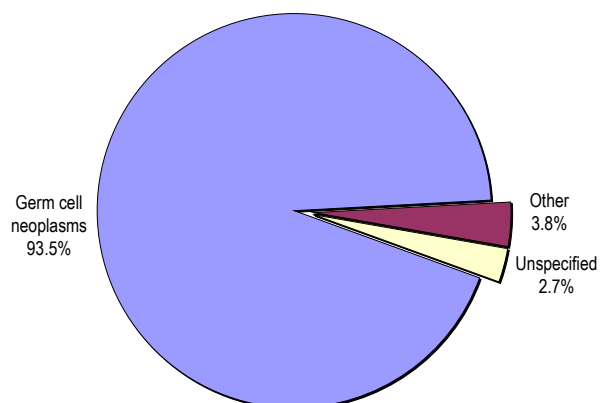


There were on average 2 boys (aged 0-14) diagnosed with testicular cancer each year during 2000-2004. (Fig. 18.1)

### 18.1.2: Cell type

Germ cell neoplasms were the most common form of testicular cancer diagnosed in Ireland during 2000-2004 making up 93.5% of the 189 testicular cancers diagnosed per year with a further 3.8% affecting another cell type (mostly trophoblastic neoplasms) and the remainder unspecified. There was very little variation in the distribution of cell type by country with 3.6% of cases having an unspecified cell type in Northern Ireland compared to 2.2% in Republic of Ireland. (Fig. 18.2)

**Figure 18.2:** Types of testicular cancer diagnosed in Ireland: 2000-2004

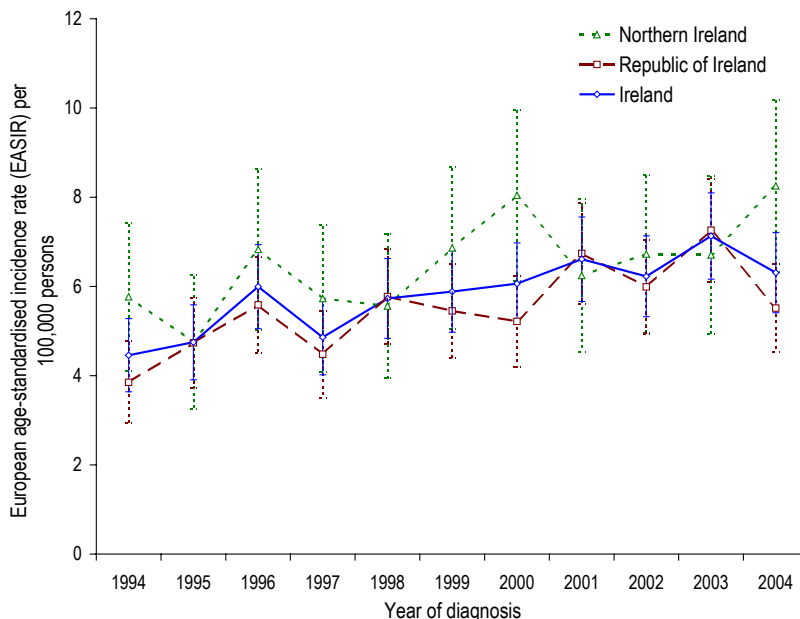


**18.1.3: Trends**

European age-standardised incidence rates (EASIR) for testicular cancer increased between 1994 and 2004 by 3.6% (p=0.001) per year. This corresponded to an annual increase of 8.3 cases per year as a result of demographic change. (Fig. 18.3, Tab. 18.2)

The significant increase in EASIRs was observed in both countries with the increase in rates slightly, but not significantly, higher in Republic of Ireland where EASIRs increased by 3.9% (p=0.013) per year compared to 3.3% (p=0.024) per year in Northern Ireland. (Fig. 18.3, Tab. 18.2)

**Figure 18.3:** Trends in European age-standardised incidence rates (EASIR) for testicular cancer by country: 1994-2004



**Table 18.2:** Number of cases and European age-standardised incidence rates (EASIR) for testicular cancer by year of diagnosis and country: 1994-2004

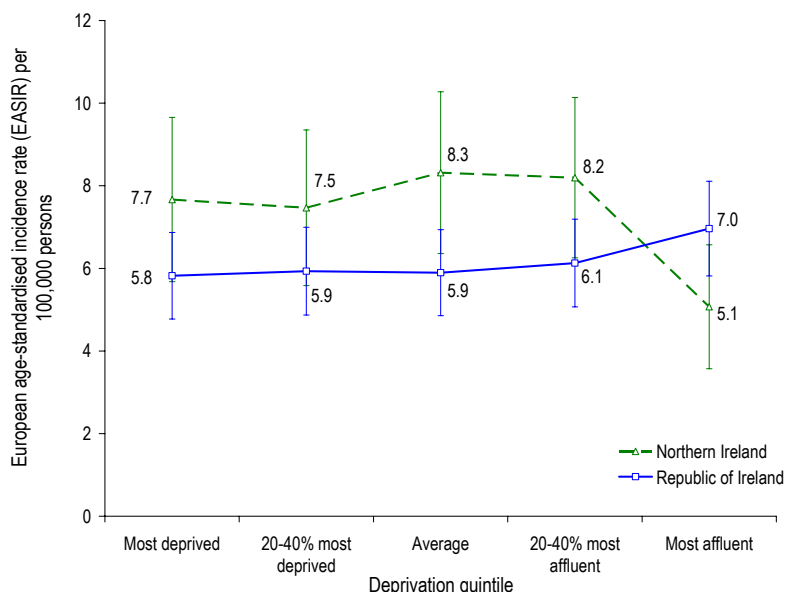
	Northern Ireland		Republic of Ireland		Ireland			Northern Ireland		Republic of Ireland		Ireland	
	Cases	EASIR	Cases	EASIR	Cases	EASIR		Cases	EASIR	Cases	EASIR	Cases	EASIR
1994	47	5.8 ±1.7	69	3.8 ±0.9	116	4.5 ±0.8	2000	68	8.0 ±1.9	103	5.2 ±1.0	171	6.1 ±0.9
1995	39	4.8 ±1.5	86	4.7 ±1.0	125	4.7 ±0.8	2001	52	6.2 ±1.7	137	6.7 ±1.1	189	6.6 ±0.9
1996	56	6.8 ±1.8	103	5.6 ±1.1	159	6.0 ±0.9	2002	56	6.7 ±1.8	127	6.0 ±1.0	183	6.2 ±0.9
1997	47	5.7 ±1.7	82	4.5 ±1.0	129	4.9 ±0.8	2003	56	6.7 ±1.8	154	7.3 ±1.2	210	7.1 ±1.0
1998	46	5.6 ±1.6	113	5.8 ±1.1	159	5.7 ±0.9	2004	70	8.3 ±1.9	120	5.5 ±1.0	190	6.3 ±0.9
1999	56	6.9 ±1.8	106	5.5 ±1.0	162	5.9 ±0.9							

EASIR: European age-standardised incidence rate with 95% CI

**18.1.4: Socio-economic variations**

During 2000-2004 there was no apparent relationship between incidence of testicular cancer and deprivation in either Northern Ireland or Republic of Ireland, despite European age-standardised incidence rates (EASIR) 51.2% (p=0.145) higher among the 20% most deprived population compared to the 20% most affluent population in Northern Ireland. EASIRs among the 20% most affluent were significantly higher in Northern Ireland than the equivalent population in Republic of Ireland. (Fig. 18.4)

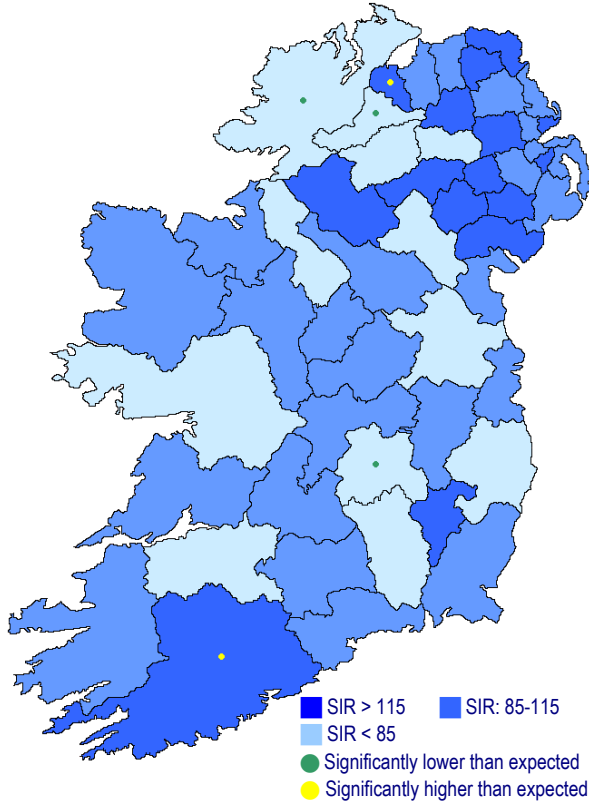
**Figure 18.4:** European age-standardised incidence rates (EASIR) for testicular cancer by country specific deprivation quintile: 2000-2004



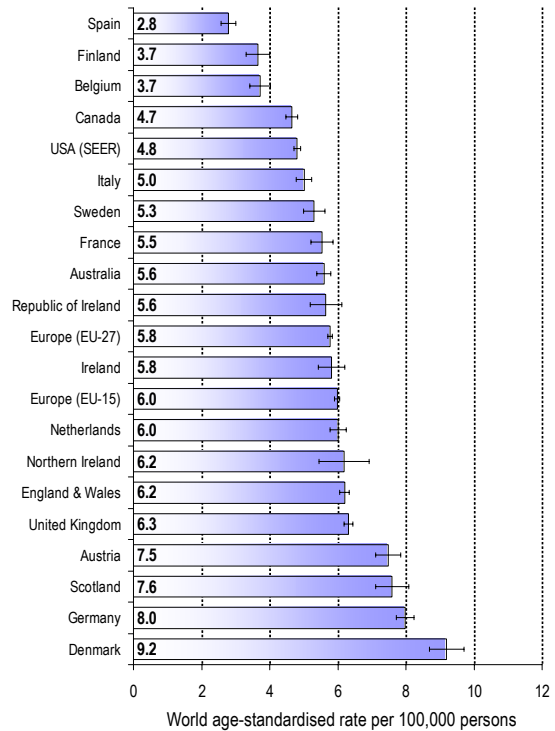
**18.1.5: Geographic variations**

Cork and Derry had significantly higher incidence rates of testicular cancer diagnosed in 1994-2004 than Ireland as a whole. Lower incidence rates than expected were however apparent in counties Donegal and Laois along with Strabane district council. Both Belfast and Dublin had incidence rates within the expected range with 7 cases in Belfast and 33 cases in Dublin diagnosed each year during the eleven year period. (Fig. 18.5)

**Figure 18.5:** Significant differences in county/council standardised incidence ratios for testicular cancer compared to Ireland as a whole: 1994-2004



**Figure 18.6:** International comparisons of world age-standardised incidence rates for testicular cancer: 1998-2000



Source: IARC<sup>143</sup>

### 18.1.6: International comparisons

Incidence rates for testicular cancer in Ireland were average compared to other developed countries with no significant difference compared to the European Union during 1998-2000. However world age-standardised rates in Ireland were higher than those in USA and Canada while those in Republic of Ireland were lower than in UK. (Fig. 18.6)

## 18.2: Survival

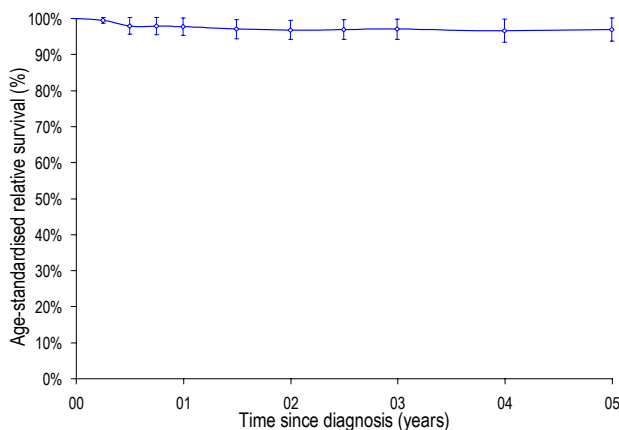
Relative survival (age-standardised) from testicular cancer was excellent with an estimated 97.7% of patients diagnosed in 2000-2004 surviving one-year and 96.9% surviving five years. (Fig. 18.7, Tab. 18.3)

**Table 18.3:** Age-standardised relative survival for testicular cancer patients by country: 2000-2004 period analysis five-year estimates

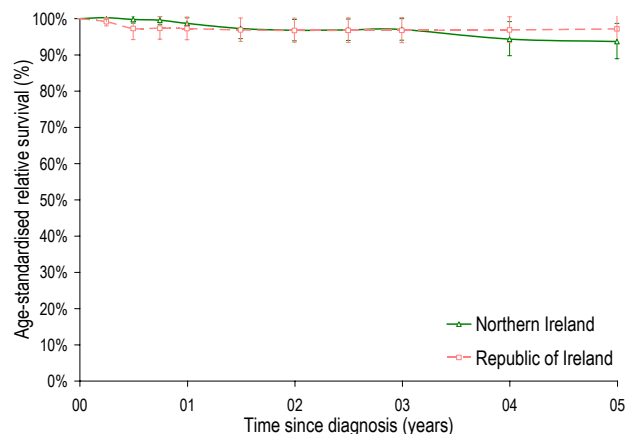
	Age-standardised relative survival (95% CI)		
	Northern Ireland	Republic of Ireland	Ireland
<b>1-year</b>	98.7% (97.2%, 100.2%)	97.3% (94.2%, 100.4%)	97.7% (95.3%, 100.2%)
<b>5-year</b>	93.7% (88.9%, 98.7%)	97.2% (93.6%, 100.9%)	96.9% (93.7%, 100.2%)

**Figure 18.7:** Age-standardised relative survival for testicular cancer patients: 2000-2004 period analysis estimates

(a) All Ireland



(b) Northern Ireland and Republic of Ireland



Survival did not vary significantly by country with five-year (age-standardised) relative survival estimated to be 97.2% in Republic of Ireland and 93.7% in Northern Ireland for patients diagnosed in 2000-2004, a 3.5% difference that was not statistically significant due to the small number of cases diagnosed annually. (Fig. 18.7, Tab. 18.3)

### 18.2.1: Changes in survival over time

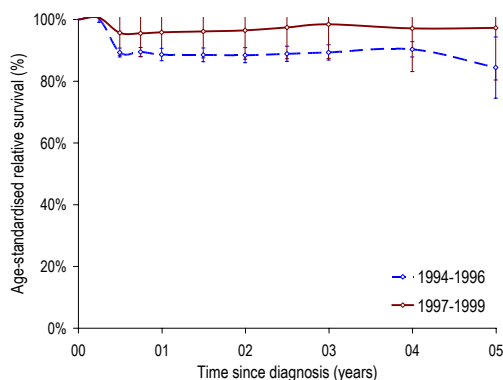
There was no significant change in survival for testicular cancer patients over time although five-year (age-standardised) relative survival for those diagnosed in 1997-1999 was 96.2% compared to 82.3% in 1994-1996. Differences of this magnitude were also observed in Northern Ireland and Republic of Ireland separately but as with all of Ireland differences did not reach statistical significance due to the small number of cases involved. (Fig. 18.8, Tab. 18.4)

**Table 18.4:** Age-standardised relative survival for testicular cancer patients by country and period of diagnosis: 1994-1999

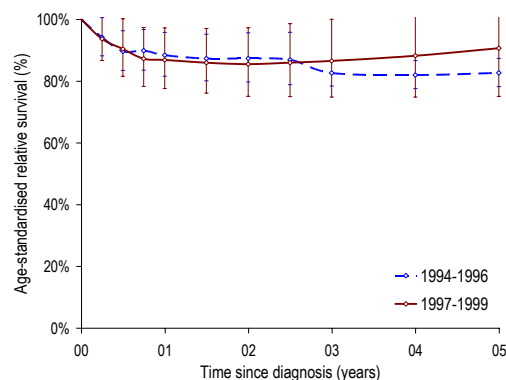
	Age-standardised relative survival (95% CI)			
	1-year		5-year	
	1994-1996	1997-1999	1994-1996	1997-1999
Northern Ireland	88.7% (86.7%, 90.7%)	95.9% (88.0%, 104.4%)	84.4% (75.6%, 94.4%)	97.3% (80.4%, 117.7%)
Republic of Ireland	88.5% (81.6%, 95.8%)	86.9% (77.6%, 97.3%)	82.7% (78.3%, 87.4%)	90.7% (75.1%, 109.6%)
Ireland	88.1% (83.2%, 93.2%)	91.9% (85.6%, 98.8%)	82.3% (76.2%, 88.9%)	96.2% (84.3%, 109.8%)

**Figure 18.8:** Age-standardised relative survival for testicular cancer patients by country and period of diagnosis: 1994-1999

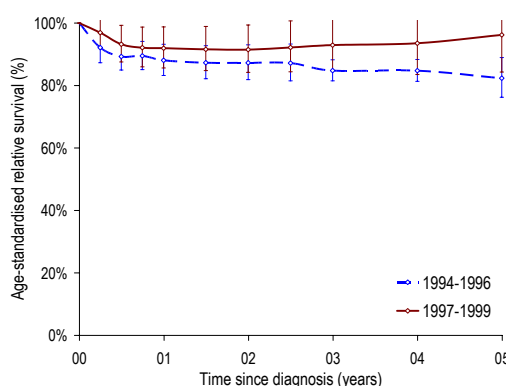
(a) Northern Ireland



(b) Republic of Ireland



(c) Ireland



### 18.2.2: Observed survival

Observed survival includes causes of death other than cancer and represents survival actually experienced by cancer patients. For those diagnosed in 1997-1999 in Ireland, observed survival from testicular cancer for those diagnosed in was 96.6% after one-year and 92.5% after five-years. This value did not vary significantly by country, nor was it significantly different from five-year observed survival for those diagnosed in 1994-1996. (Tab. 18.5)

**Table 18.5:** Observed survival for testicular cancer patients by country and period of diagnosis: 1994-1999

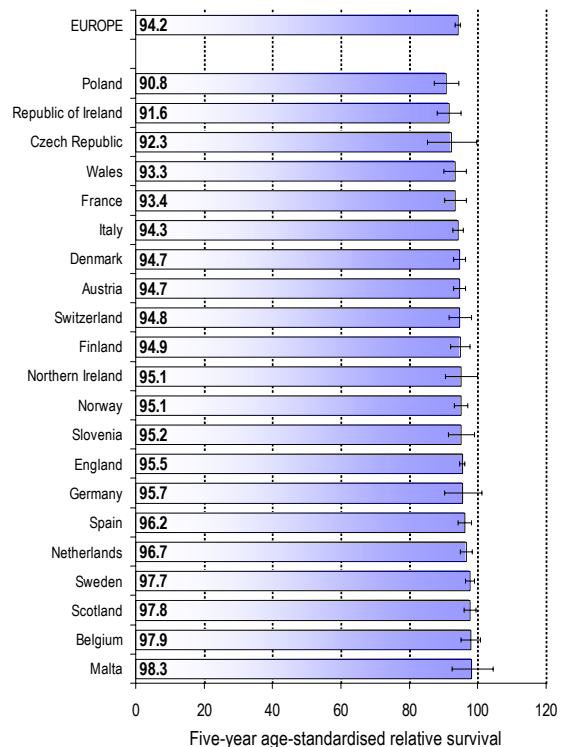
	Observed survival (95% CI)			
	1-year		5-year	
	1994-1996	1997-1999	1994-1996	1997-1999
Northern Ireland	95.7% (92.3%, 99.1%)	98.7% (96.8%, 100.0%)	92.8% (88.5%, 97.2%)	94.6% (91.1%, 98.3%)
Republic of Ireland	94.6% (91.8%, 97.4%)	95.5% (93.2%, 97.9%)	88.3% (84.5%, 92.3%)	91.4% (88.3%, 94.7%)
Ireland	94.9% (92.8%, 97.1%)	96.6% (94.9%, 98.3%)	89.9% (86.9%, 92.9%)	92.5% (90.1%, 95.0%)

### 18.2.3: European comparisons

Five-year (age-standardised) relative survival from testicular cancer for patients diagnosed in 1995-1999 was greater than 90% for all European countries included in the EUROCORE-IV study conducted in 2007. In particular the average value for all of Europe was 94.2%.

Republic of Ireland however had one of the lowest values in Europe for five-year (age-standardised) relative survival from testicular cancer at 91.6%. Although this value was not significantly different from the European average, it was significantly lower than the equivalent survival rates in Scotland and Sweden. There was no significant variation between five-year (age-standardised) relative survival in Northern Ireland and the European average, or with survival in any European country included in the study. (Fig. 18.9)

Figure 18.9: European comparisons of five-year age-standardised relative survival for testicular cancer patients: 1995-1999



Source: EUROCORE-IV<sup>144</sup>

### 18.3: Mortality

Testicular cancer was a rare cause of cancer death in Ireland making up 0.2% of all male cancer deaths (excluding NMSC) between 2000 and 2004. There were 9 deaths per year from the disease with one third of these occurring in Northern Ireland. There was no variation in European age standardised mortality rates (EASMR) between Northern Ireland and Republic of Ireland. (Tab. 18.6)

Table 18.6: Summary statistics for deaths from testicular cancer: 2000-2004

	Northern Ireland	Republic of Ireland	Ireland
Number of deaths per year	3	6	9
% of all cancer deaths (ex. NMSC)	0.2%	0.2%	0.2%
Median age at death	28	33	33
Cumulative risk (Aged 0 to 74)	0.03%	0.02%	0.02%
Crude rate per 100,000 persons	0.4	0.3	0.3
EASMR ± 95% CI	0.4 ± 0.2	0.3 ± 0.1	0.3 ± 0.1
% difference (NI vs ROI) ± 95% CI (+ NI higher, - NI lower)			18.9% ± 77.9

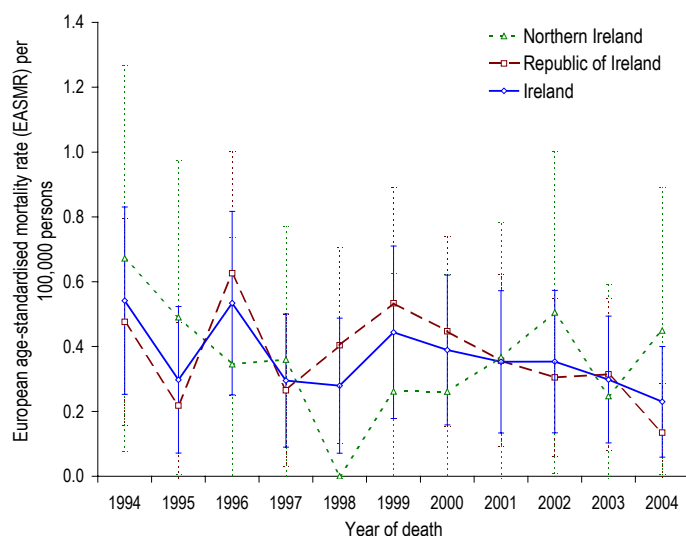
EASMR: European age-standardised mortality rate per 100,000 persons; CI: Confidence interval

#### 18.3.1: Trends

Between 1994 and 2004 European age-standardised mortality rates (EASMR) for testicular cancer in Ireland decreased by 5.1% per year (p=0.038) with the actual number of deaths falling by an average of one death every three years. (Fig. 18.10)

EASMRs however did not change significantly in either Northern Ireland or Republic of Ireland with only very small changes in the annual number of deaths observed – a decrease of one death every ten years in Northern Ireland and a decrease of one death every five years in Republic of Ireland. (Fig. 18.10)

Figure 18.10: Trends in European age-standardised mortality rates (EASMR) for testicular cancer by country: 1994-2004



## 18.4: Prevalence

Between 1994 and 2004 there were 1,793 people diagnosed with testicular cancer. Of these 93.5% (1,676 people) were still alive at the end of 2004. The majority of these (910 people) were diagnosed in the 2000-2004 period, which was 96.5%

**Table 18.7:** Prevalence of testicular cancer in Ireland at the end of 2004 by country and period of diagnosis

	Diagnosed 1994-2004		Diagnosed 2000-2004	
	Prevalence	% of cases diagnosed during period	Prevalence	% of cases diagnosed during period
Northern Ireland	558	94.1%	289	95.7%
Republic of Ireland	1,118	93.2%	621	96.9%
Ireland	1,676	93.5%	910	96.5%

of all those diagnosed within these five years. 289 survivors were resident in Northern Ireland while 621 were resident in Republic of Ireland. At the end of 2004 the number of people living with testicular cancer diagnosed within the previous five years per 100,000 persons was 10.0% greater in Northern Ireland than Republic of Ireland. (Tab. 18.7)

## 18.5: Discussion

The testicles are part of the male reproductive system that produces sperm for the purposes of fertilization. A lump is the most common symptom associated with testicular cancer although most lumps on the testicles are not cancer. A further symptom is usually a dull ache in either the affected testicle or in the abdomen.<sup>145</sup>

Most cases of testicular cancer have no detectable risk factor. However a history of undescended testes can increase risk by up to ten times.<sup>146</sup> The use of an operation to lower the testes reduces this risk, but the risk of developing cancer of the testes is still higher than average.<sup>146</sup> Infertility and fertility problems can increase risk<sup>147</sup> as can the inheritance of a faulty gene, TGCT1, which can increase risk up to five times and can result in family clusters of testicular cancer.<sup>148</sup> The probability of developing testicular cancer linked with infertility problems or genetic factors remains small.

Worldwide there are approximately 50,000 cases of testicular cancer diagnosed each year with incidence in developed countries, including Ireland, increasing. The reasons for this are not completely understood although improvements in diagnostic procedures are believed to be partly responsible.

Survival from the disease is very high due to the effectiveness of chemotherapy using cisplatin to combat the disease, which can show positive results even in some cases where testicular cancer has begun to metastasise. Since the development of this drug in the 1970s mortality from the disease has fallen dramatically and continues to fall in Ireland despite the already low number of deaths per year. Full control of this disease is thus possible given the effectiveness of treatment although early diagnosis maximises survival prospects. With no reliable screening processes in existence diagnosis must first start with the general population recognising symptoms although self-checking remains a controversial recommendation.