



Cancers of the testis

Case numbers and histological types

An average of 132 cases of testicular cancer was diagnosed per year in Ireland between 1994 and 2010 (Table 1). Almost all cases were microscopically verified (98%) and were germ-cell tumours—57% of which were seminomatous and 40% non-seminomatous subtypes. Non germ-cell subtypes, of which less than 2 cases were diagnosed per year, included sarcomas and sex cord tumours.

Table 1. Annual average number of testicular cancers diagnosed in Ireland and percentage of histological types, 1994–2010

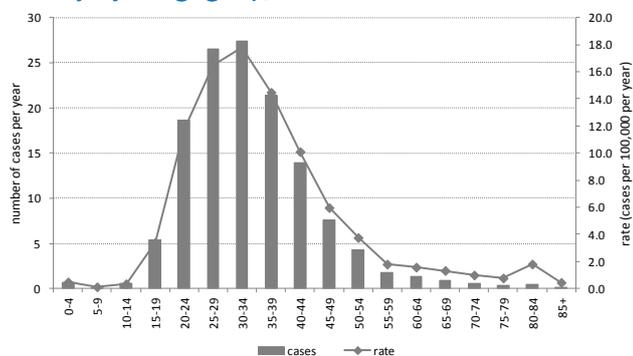
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|---|-------|
| cases per year | 132 |
| incidence rate (cases per 100,000 per year) | 6.2 |
| histological subtype | |
| non-seminomatous germ cell | 40.4% |
| seminoma | 57.0% |
| spermatocytic seminoma | 0.6% |
| sarcoma | 0.9% |
| sex-cord tumours | 0.4% |
| other/unspecified | 0.7% |

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Age profile

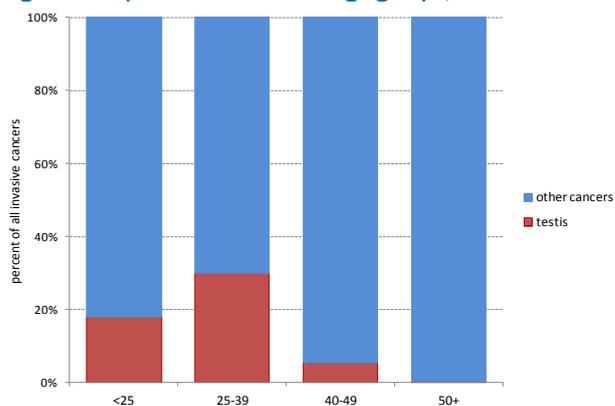
Testicular cancers are more common in young men; three-quarters of all patients in Ireland were under 40 years at diagnosis (Figure 1). The highest incidence rates were in patients aged between 25 and 34.

Figure 1. Number of cases and age specific rate of testicular cancer by 5 year age group, 1994–2010



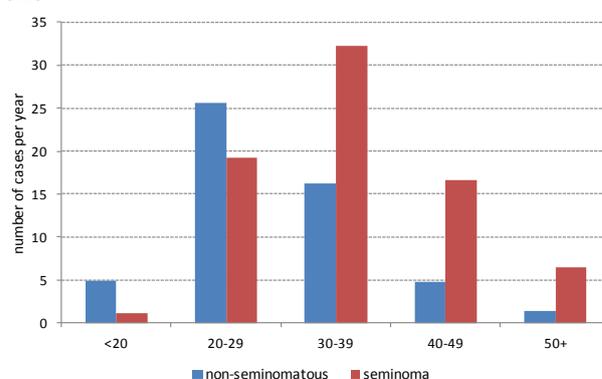
Testicular cancer is relatively rare compared to other cancer sites and overall makes up less than 2% of all invasive cancers diagnosed in men.¹ However in young patients, it is one of the most common cancers, representing 30% of all cancers in 25-39 year olds (Figure 2). Very few men aged over 50 are diagnosed with testicular cancer (less than 10 per year).

Figure 2. Testicular cancer as a percentage of all cancers diagnosed in patients of different age groups, 1994–2010



The sub-type of testicular cancer also varies with age (Figure 3). Non-seminomatous tumours were most common in younger patients and made up 80% of testicular tumours in patients under 20 years of age. A decline in the proportion of non-seminomatous tumours, with an accompanying increase in the proportion of seminomas, was apparent with increasing age. Over 80% of tumours diagnosed in patients aged 40 or over were seminomatous cell types.

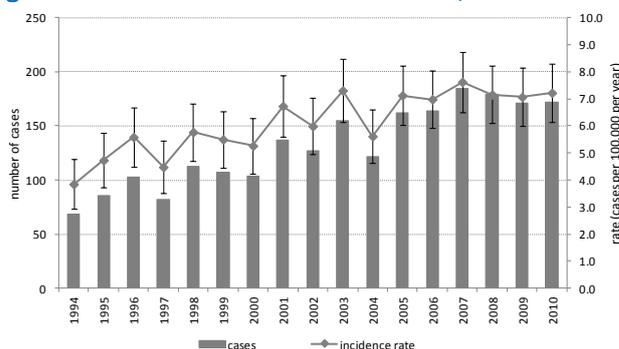
Figure 3. Variation in the proportion of seminomatous and non-seminomatous testicular cancer subtypes by age group, 1994–2010



Time trends in incidence and mortality

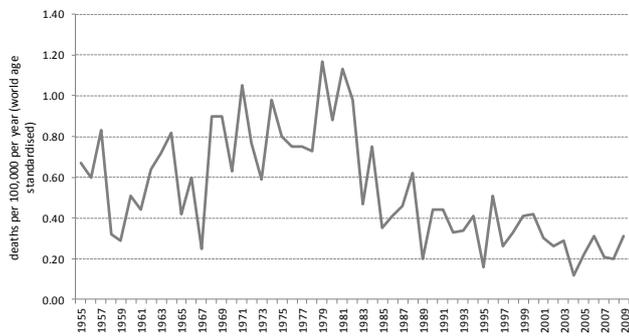
There has been a clear increase in case numbers and incidence rates per year for testicular cancer in Ireland since 1994. The overall annual percentage increase in age-standardised rate was 2.1% (±1.5%) between 1994 and 2010 (Figure 4). Similar trends have been reported internationally, and worldwide incidence rates have more than doubled in the past 40 years.^{2,3}

Figure 4. Trends in testicular cancer incidence, 1994–2010



Despite the increase in incidence, mortality rates for testicular cancer have fallen substantially in Ireland since the 1950s (Figure 5). Although mortality rates have been variable between years, a clear decline is evident, from the maximum rates during the 1970s, when up to 20 deaths per year were registered, to recent years when fewer than 10 people per year have died from this cancer. Most of this decline in mortality occurred over a relatively short period between 1981 and 1985.

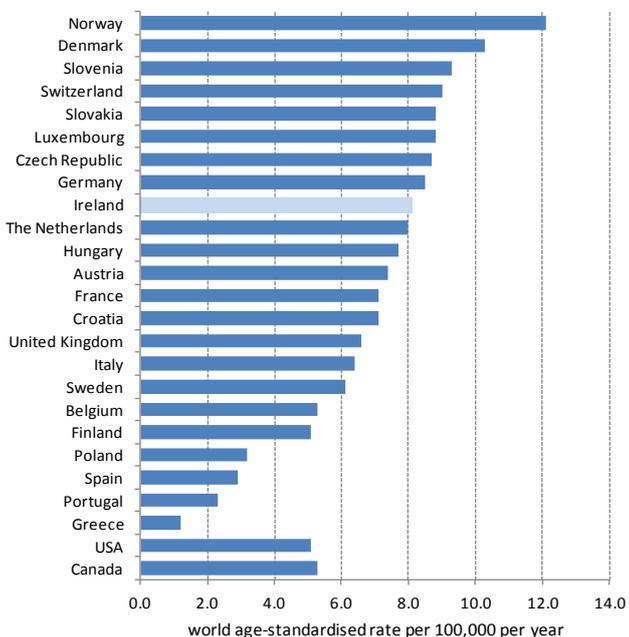
Figure 5. Trends in testicular cancer mortality, 1955–2009⁴



International variation in incidence and mortality

The highest incidence rates of testicular cancer were recorded in Norway and Denmark (>10 cases per 100,000 per year, world age standardised rate) while the lowest incidence in Europe was recorded in Spain, Portugal and Greece (<3 cases per 100,000 per year) (Figure 6). Spatial and temporal variation in testicular cancer incidence rates in Europe has been the subject of some debate, with exposure to environmental pollutants and genetic predisposition cited as possible risk factors. Differences in disease awareness have also been proposed as an explanatory factor.² Incidence in Ireland was approximately 20% higher than the average for the 25 countries examined but was similar to that in the Netherlands and Germany. Mortality rates varied less between countries, and averaged 0.3 deaths per 100,000 per year with Ireland ranking close to the average.

Figure 6. Incidence for testicular cancer in 25 countries, 2008⁵

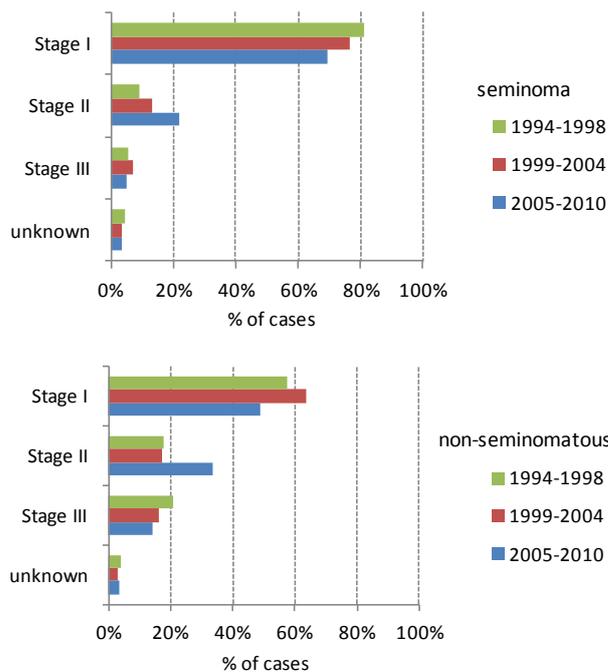


*Note: the rates shown are world age standardised (so Irish rates appear somewhat higher than in Figure 4 (European age standardised rates))

Stage at diagnosis

The majority of testicular cancers are diagnosed at an early stage (stage I) - particularly seminomas, which tend to be slower growing than non-seminomatous tumours³ (Figure 7). Overall, more than 60% of all testicular cancers were diagnosed at stage I. A slight decline over time was observed in the proportion of stage I tumours, with a corresponding increase in stage II tumours, where cancer is present in the lymph nodes. However, this may be influenced by improvements in imaging techniques over time, allowing for more accurate staging. Although a greater proportion of non-seminomatous cancers were late stage (stage III) compared to seminomas, their numbers overall were small (<150 cases in the 17 year period) and the proportion has declined over time, from 20% in 1994-1998 to 14% in 2005-2010.

Figure 7. Percentage of testicular cancers by stage for seminoma and non-seminomatous subtypes, 1994-2010



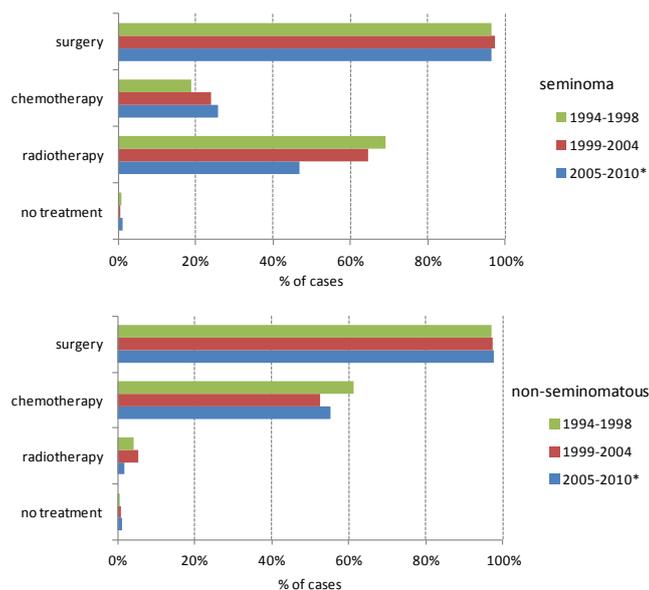
Treatment

Almost all patients diagnosed with testicular cancer undergo surgery as their main treatment (Figure 8). Surgery normally involves the removal of the entire testis, as recommended by international guidelines⁶ and very few patients (<3% in Ireland) have a local excision only.

The decision to administer chemotherapy or radiotherapy is determined by both the type of tumour and the stage of the disease.⁶ Between 50% and 60% of all patients with seminoma received radiotherapy in addition to surgery (Figure 8). In contrast, few patients (<5%) with non-seminomatous tumours had radiotherapy, but were more likely to have chemotherapy.

Overall, there has been little change over time in the proportion of patients having surgery and chemotherapy. However, there has been a recent decline in the proportion of seminoma patients undergoing radiotherapy.

Figure 8. Treatment by time period: seminomatous and non-seminomatous testicular cancer, 1994–2010

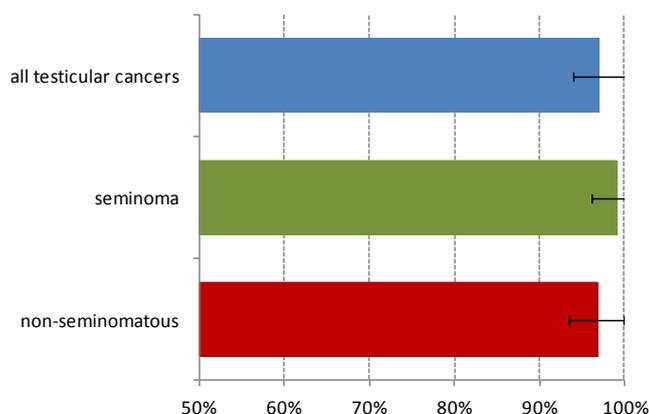


*for radiotherapy, figures represent 2005-2009 inclusive

Survival⁷

Testicular cancer has one of the highest cure rates of all cancers, with a 5 year relative survival overall of over 96% (Figure 8). Patients diagnosed with seminoma had five-year survival rates of close to 99%, which may reflect the fact that the majority of patients are diagnosed at an early stage (stage I). Long term prognosis for testicular cancer is very good - for those patients diagnosed in Ireland in 1994 and 1995, the earliest years for which national data are available, 86% are known to have survived at least 15 years after their diagnosis.

Figure 8. Five year relative survival (with 95% confidence intervals) for testicular cancer patients⁷

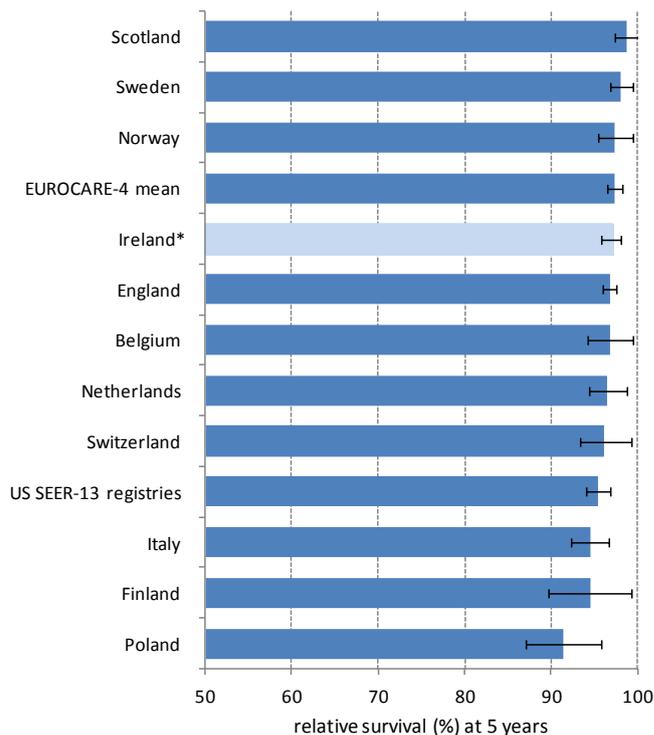


International variation in survival⁸

Five year relative survival of testicular cancer patients is generally high in all developed countries and the most recent estimate for Europe overall was 97% (Figure 9). Variation between countries

(where comparable data is available) is fairly low and Ireland is ranked close to the European average.

Figure 9. Five year relative survival testicular (period analysis 2000-2002⁸)



*for Ireland, cases diagnosed 2000-2010 inclusive

References and notes

1. Cancer in Ireland, 2011. Annual report of the National Cancer Registry. NCRI.
2. Huyghe, E. et al, 2007. Testicular cancer variations in space and time in Europe. *Eur Urol* 51 (3): 621-628.
3. National Cancer Institute, USA. Testicular cancer screening PDQ. www.cancer.gov/cancertopics/pdq/screening/testicular
4. Source: WHO mortality database. www-dep.iarc.fr/WHOdb/WHOdb.htm
5. Source: Globocan database. <http://globocan.iarc.fr/>
6. Albers, P et al, 2012. European Association of Urology - Guidelines on testicular cancer. *Actas Urol Esp.* 36(3):127-45
7. Cases diagnosed 2000-2009, followed up to 31/12/2010.
8. Recent cancer survival in Europe: a 2000–02 period analysis of EURO-CARE-4 data. Verdecchia A, et al; EURO-CARE-4 Working Group. *Lancet Oncol.* 2007, 8:784–96.