National Cancer Registry Ireland **Cancer Trends**

Cancer of the pancreas

Case numbers and histological types

Cancer of the pancreas accounts for approximately 2.5% of all invasive cancers and is the 9th most commonly diagnosed cancer in Ireland.[1] Almost 400 cases of pancreatic cancer were diagnosed annually between 1994 and 2010 (Table 1). Equal numbers of male and female patients were diagnosed per year, although incidence rates (cases per 100,000) were higher in men than women. Over half of all pancreatic cancers were sited in the head of the pancreas. However for one-third of cases, the site within the pancreas was unspecified.

Table 1. Annual average numbers and incidence rates of pancreatic cancers and breakdown by site, 1994–2010

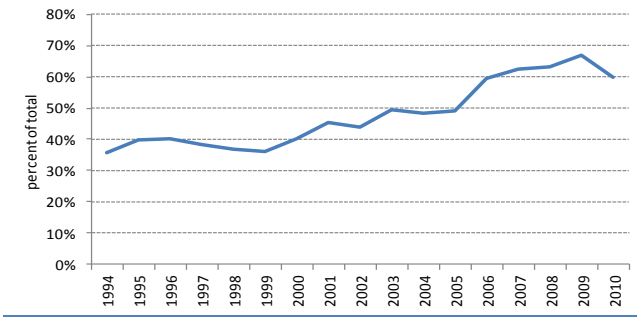
	total	*females*	*males*
annual average numbers	394	*197*	*197*
incidence rate*	9.9	*8.7*	*11.3*

location (ICD-O code)	total	% of all
head (C25.0)	267	52.4%
body (C25.1)	27	6.8%
tail (C25.2)	24	6.2%
pancreatic duct (C25.3)	3	0.7%
islets of Langerhans (C25.4)	<1	0.1%
neck (C25.7)	6	1.4%
unspecified (C25.8-C25.9)	128	33.4%

** cases per 100,000 per year (age standardised)*

During the 1990's, fewer than 40% of all pancreatic cancers were histologically verified (Figure 1). During this period, approximately 45% of cases were diagnosed through radiological methods only (x-ray, ultrasound, CT scans etc) and over 10% were diagnosed clinically only. This has changed over time and from the mid 2000's onwards over 60% of cases have had a histologically based diagnosis. The proportion of cases diagnosed through radiology has fallen to approximately 25% and fewer than 5% of cases are now diagnosed clinically only.

Figure 1. Trends in the proportion of pancreas cancers diagnosed histologically, 1994–2010



Over half of all pancreatic cancers diagnosed between 1994 and 2010 were of unspecified histological type (Table 2) due to the low level of histological verification. However, only 4% of histologically verified cancers were of unknown type. Just over 70% of all histologically confirmed cases were adenocarcinoma (unspecified) and a further 13% were specific exocrine cancer subtypes. Approximately 4% of all cases were neuro-endocrine tumours, a similar proportion to that reported in the literature.[2]

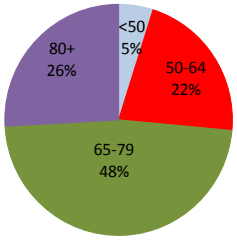
Table 2. Histological subtypes of pancreatic cancers diagnosed 1994-2010

	all cancers	*histologically verified*
neoplasm unspecified	52%	4%
epithelial cancer, unspecified	4%	8%
adenocarcinoma, unspecified (M-8140/3)	34%	70%
adenocarcinoma, specific subtypes	4%	7%
other cancer of specific subtype	3%	6%
undifferentiated cancer	1%	1%
neuroendocrine cancer	2%	4%

Age profile

The majority of all pancreatic cancers were diagnosed in patients aged over 65 (Figure 2). Just 5% of all patients were under age 50 at diagnosis. Although over one quarter of all cases were diagnosed in patients aged 80 or older, during the last 5 years (2006-2010) only 24% of these patients had a histological diagnosis (compared to 61%-70% in younger patients), contributing to a higher proportion of unspecified cancer types in this age group.

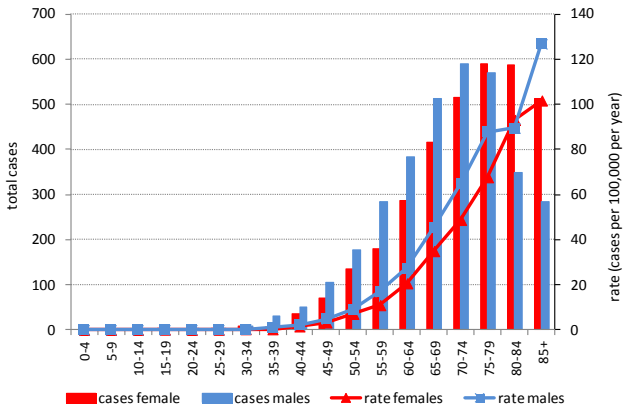
Figure 2. Age distribution of pancreas cancer and variation in proportions of histologically diagnosed cases by age, 2006-2010



	% histologically verified	% unspecified cancers
<65 years	61%	21%
65-79 years	70%	38%
80+ years	24%	80%
Total	63%	44%

Males had a higher incidence rate than females at all ages, although female patients outnumbered males in the older age groups (Figure 3). This reflects a slightly older age profile for females - 33% of female patients were aged 80 or older compared to 19% of males.

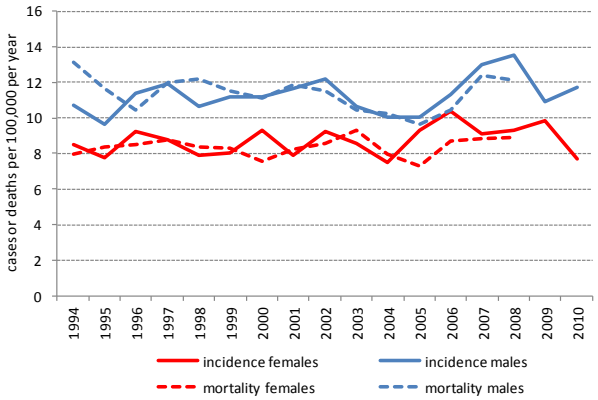
Figure 3. Variation in the number of cases and incidence rates by age, 1994–2010



Time trends

There has been relatively little change in age-standardised incidence or mortality rates for pancreatic cancer over time – no significant trends were seen in either incidence or mortality rates for either sex (Figure 4). Males had consistently higher rates than females and both sexes had high mortality/ incidence ratios (close to 1.0), i.e. as many pancreatic cancer deaths reported as there were new cases diagnosed, an indication of the poor survival from this cancer.

Figure 4. Trends in pancreatic cancer incidence and mortality, 1994–2010



Geographical distribution

Recent analysis has shown a clear gradient in pancreatic cancer incidence from highest in the south and west to lower incidence in the north and east of the island of Ireland.[3] This was also evident to some extent in the overall incidence rates for the four HSE areas (Table 3). Rates for both males and females were highest in the HSE South and West regions, although differences between the regions were not statistically significant.

There was little evidence of any relationship between incidence and deprivation index: socio-economic factors have been previously reported as accounting for only a small proportion of the observed geographic variation in pancreatic cancer on the island of Ireland.[3]

Table 3. Incidence rates (cases per 100,000 per year ± 95% CI*) by HSE region, pancreas cancer, 1994–2010

	females	males
Dublin & Mid Leinster	8.3 ± 0.6	10.9 ± 0.8
Dublin & North East	8.3 ± 0.7	11.0 ± 0.9
South	9.2 ± 0.6	11.6 ± 0.8
West	9.0 ± 0.6	11.7 ± 0.8
Ireland overall	8.7 ± 0.6	11.3 ± 0.6

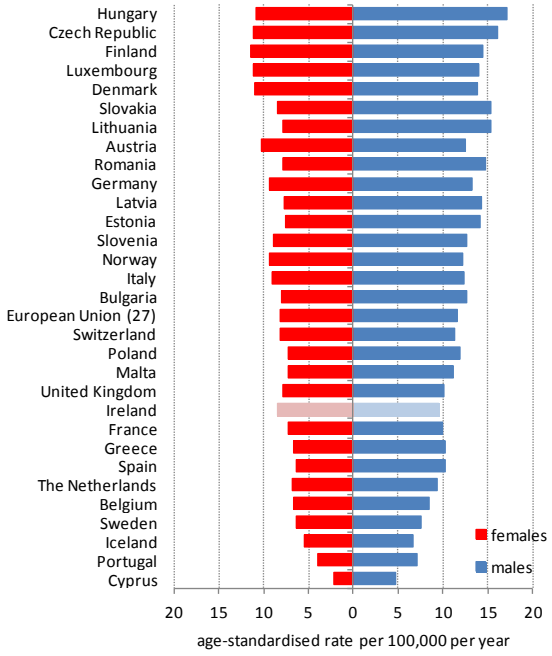
** 95% confidence intervals*

International variation in incidence and mortality[4]

Compared to other European countries, the incidence of pancreatic cancer in Irish males was relatively low, ranking 24th of 30 countries (Figure 5). Rates for males ranged from over 16 per 100,000 in Hungary and the Czech Republic to less than 5 cases per 100,000 in Cyprus. Irish females ranked 11th highest overall and the highest rates were found, as for males, in Hungary and the Czech Republic but also in Finland, Denmark and Luxembourg - all with incidence rates of 11 cases per 100,000 or higher. The lowest incidence rates for females were found in Cyprus and Portugal (less than 4 cases per 100,000).

The ranking of countries by pancreatic cancer mortality rates was very similar to that observed for incidence - Irish males ranked 26th and females ranked 14th of 30 countries.[4]

Figure 5. Estimated incidence for pancreatic cancer, 2008[4]



Stage at diagnosis

The proportion of staged cancers has increased over time, more or less in parallel with the proportion of cases diagnosed histologically (Figure 7). However despite this, there has been little change in the distribution of tumour stages over time, with the majority of cases already at an advanced stage (Stage IV) when first diagnosed (Figure 8). This is because there are usually none or few signs or symptoms of the cancer at an early stage which can lead to some delay in its diagnosis. Some of these symptoms (such as abdominal pain, weight loss and fatigue) also tend to be similar to those for many other illnesses. The proportion of patients with Stage IV tumours at diagnosis has increased from 60% in 1994-97 to 67% in 2002-05 with a corresponding decline in Stage I cancers (21% in 1994-97 to 11% in 2006-09).

Figure 6. Percentage of pancreas cancers that were staged and diagnosed histologically, 1994–2009[5]

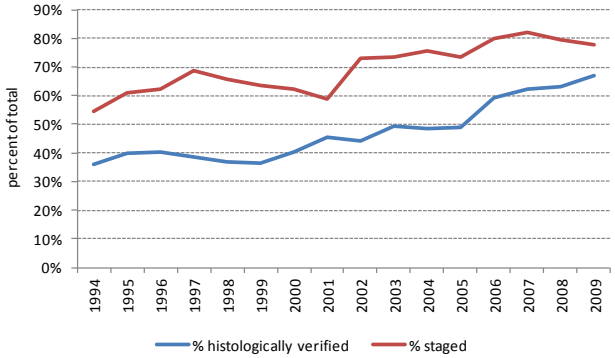
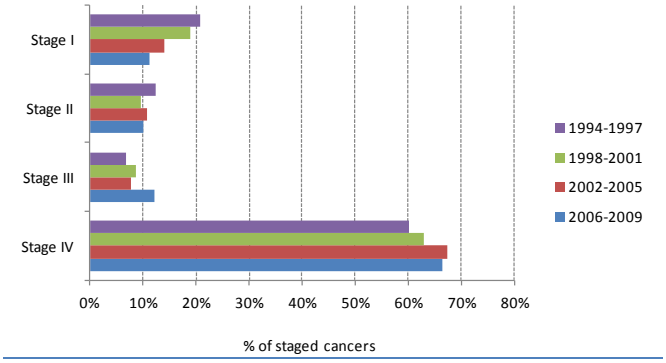


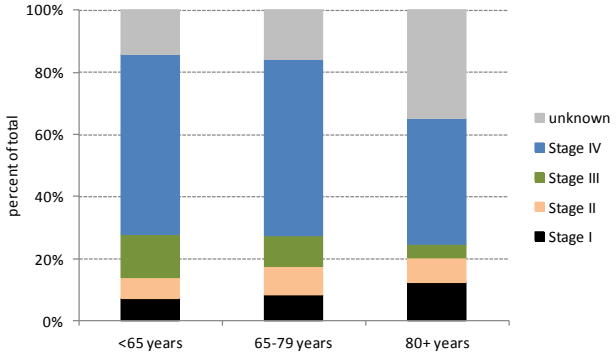
Figure 7. Percentage of pancreas cancers by stage and variation in the distribution of staged tumours over time, 1994–2009[5]



The proportion of cancers diagnosed at an early stage (Stage I or II) comprised less than 20% of all cancers in the 3 major age groups diagnosed between 2006 and 2009 (Figure 9). Patients aged 80 and over had the highest proportion of unstaged tumours and the proportion of Stage IV tumours was high in all 3 major age groups.

Little difference was observed in the distribution of stage between male and female patients.

Figure 8. Percentage of pancreas cancers by stage (including unknown stage) and age group, 2006–2009[6]



Treatment

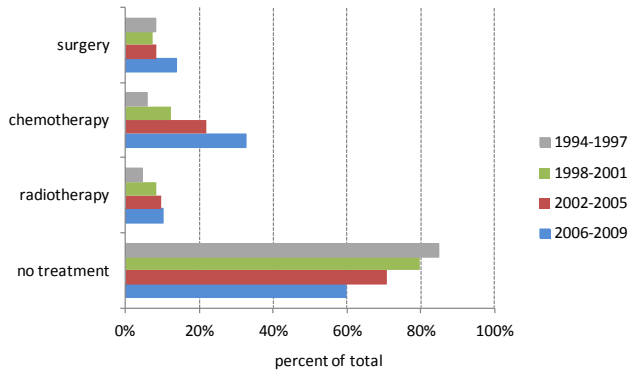
The majority of pancreatic cancer patients do not have any tumour-directed treatment (Figure 7) and although in recent years, more patients are having some form of tumour-directed treatment (i.e. tumour-directed surgery, chemotherapy or radiotherapy), over 60% of all patients still remained untreated during 2006-2009.

Less than 15% of all patients had tumour-directed surgery. Largely due to the fact that the majority of patients are diagnosed at a late stage when surgery for tumour removal or reduction may be unsuitable, many of these patients have other procedures to relieve symptoms. Over 40% of patients not having tumour-directed surgery had some other procedure, such as the insertion of a stent in blocked bile ducts to relieve jaundice.

Radiotherapy, like tumour-directed surgery, is also relatively rarely administered for pancreatic cancer, with fewer than 10% of patients having this form of treatment.

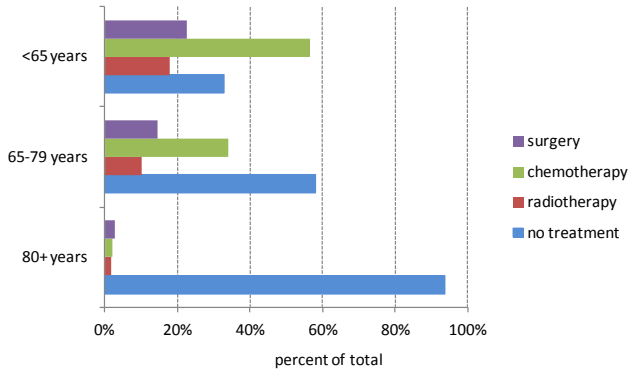
Although there has been a slight increase in the proportion of patients undergoing tumour-directed surgery and radiotherapy in recent years, the most noticeable change in treatment has been in the increase in chemotherapy, from less than 10% in the 1990's to a third of all patients in 2006-2009.

Figure 9. Variation in treatment of pancreatic cancer by time period: 1994–2009[5]



Treatment varies considerably with age and almost 95% of all patients aged 80 or over had no tumour-directed treatment for their cancer (Figure 11). Patients aged under 65 had the highest rates of all 3 treatment categories with almost 60% having chemotherapy. Despite this, 33% of these patients still remained untreated.

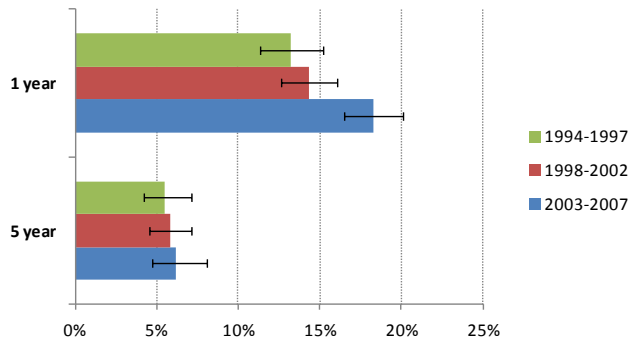
Figure 10. Variation in treatment of pancreatic cancer by age group: 2006–2009[6]



Survival[7]

Survival rates for pancreatic cancer are poor relative to many other cancers with 5 year relative survival rates of only 5% - 6% (Figure 12). Female patients had somewhat better survival than males (8.6% compared to 3.8% for patients diagnosed in 2003-07).

Figure 11. One and five year relative survival by time period (with 95% confidence intervals) for pancreatic cancer (both sexes)



For all patients diagnosed since 1994, less than 2% survived longer than 3 years and 87% of all patients died within 12 months of their diagnosis (Table 5). Some improvement in one-year relative survival has been observed, particularly in recent years, although this still remains under 20% (Figure 12). This improvement may be related to increases in the use of chemotherapy, and to a lesser extent, surgery in recent years.

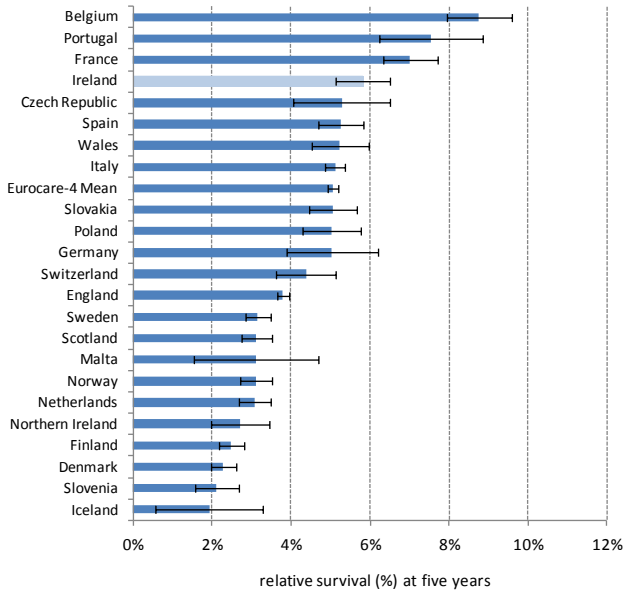
Table 4. Proportion of patients (diagnosed 1994-2006) surviving up to 3 years post diagnosis[7]

	Percent of all patients
died within 12 months	87%
survived 1 - 2 years	7%
survived 2 - 3 years	4%
survived ≥ 3 years	2%

International variation in survival[8]

Five year relative survival estimates for pancreatic cancer were poor throughout all European countries (Figure 13). Survival rates for patients diagnosed between 1995 and 1999 ranged from 9% in Belgium to less than 2% in Iceland, and Ireland ranked 4th highest of over 20 countries analysed. Although more up to date information on survival rates across Europe is not yet available, more recent figures from the US show similarly poor survival rates – 5 year relative survival for patients diagnosed between 2001 and 2007 were calculated at 5.5% (5.2% for men, 5.7% for women).[9]

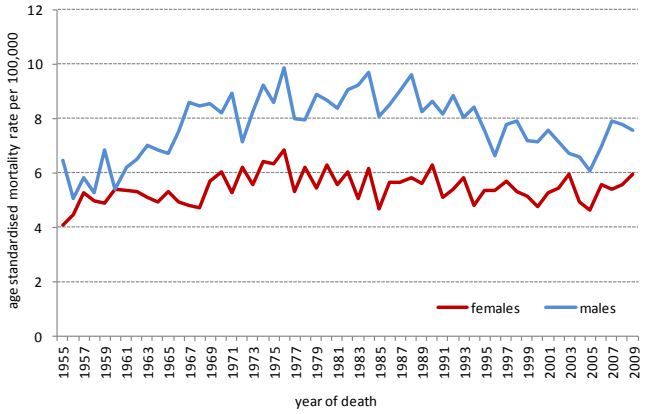
Figure 12. Five year relative survival for pancreatic cancers diagnosed 1995-1999



Long Term Trends in Irish Mortality Rates

Mortality rates from pancreatic cancer increased in men and women during the 1960's and 70's, reaching maximum rates in both sexes during the mid/late 1970s and 80's (Figure 14). Mortality rates tended to vary more in males than in females but both sexes have shown a decline and somewhat levelling off of mortality rates in recent years. This pattern has also been observed in other European countries and recent drop offs in mortality rates have been attributed to a decline in smoking, a major risk factor for pancreatic cancer[10]

Figure 13. Age-standardised mortality rate (world standard population) for cancer of the pancreas 1955–2009[11]



References and notes

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3. All Ireland Cancer Atlas, 1995-2007. NCRI Cork/NICR Belfast 2011.
4. Source: European Cancer Observatory (ECO) http://eu-cancer.iarc.fr/
5. Information on cancer stage and treatment is complete to the end of 2009 only.
6. 2006-2009 corresponds to period where maximum proportion of cases were histologically verified and staged.
7. Cases followed up to 31/12/2009.
8. EUROCARE-4, Five year relative survival for pancreatic cancers diagnosed 1995-1999: results available online, EUROCARE working group, www.eurocare.it/Portals/0/CDEU4/Forms/SA9599.aspx
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