

BRAIN AND NERVOUS SYSTEM CANCER



This document provides statistical information about non-malignant (blue table) and malignant (red table) brain and central nervous system (CNS) cancers in Northern Ireland.

NUMBER OF CASES PER YEAR (2012-2016) ¹			NUMBER OF DEATHS PER YEAR (2012-2016)		
Male	Female	Both sexes	Male	Female	Both sexes
96	146	242	11	12	23
FIVE-YEAR SURVIVAL (2006-2010)			24-YEAR PREVALENCE (2016)		
Male	Female	Both sexes	Male	Female	Both sexes
90.7%	92.8%	92.0%	2,094	2,671	4,765

NUMBER OF CASES PER YEAR (2012-2016) ¹			NUMBER OF DEATHS PER YEAR (2012-2016)		
Male	Female	Both sexes	Male	Female	Both sexes
86	61	147	70	44	113
FIVE-YEAR SURVIVAL (2006-2010)			24-YEAR PREVALENCE (2016)		
Male	Female	Both sexes	Male	Female	Both sexes
24.0%	24.8%	24.5%	340	288	628

¹ Mean yearly incidence data for period 2012-2016 has been rounded to nearest integer, and thus some numbers in tables will not add to give the exact total.

INCIDENCE

A total of 1,278 males and 1,767 females were diagnosed with non-malignant brain tumours between 2007 and 2016. This compares with a total of 850 males and 566 females who were diagnosed with malignant brain tumours in a similar time period. The probability of developing a non-malignant brain tumour before the age of 75 are 1 in 136 for a male and 1 in 102 for a female whilst the probability of developing a malignant brain tumour before the age of 75 are 1 in 141 for a male and 1 in 212 for a female. Brain cancer of any variety is therefore *rare* in the general population.

Incidence trends

Table 1: Incidence of non-malignant brain and CNS cancer by sex and year of diagnosis: 2007-2016

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Male	158	179	183	168	108	98	82	88	100	114
Female	211	230	207	238	152	168	141	125	160	135
Both sexes	369	409	390	406	260	266	223	213	260	249

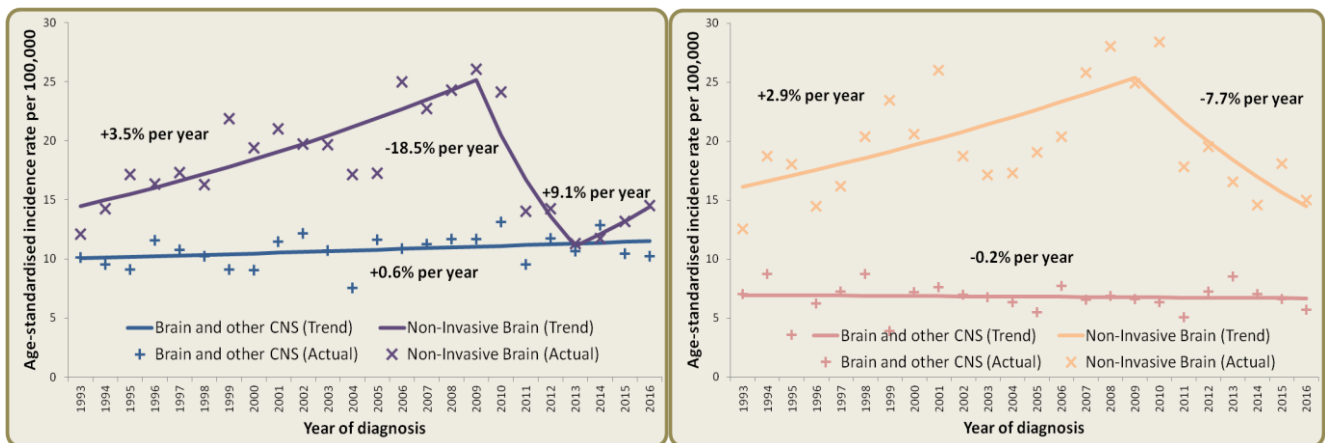
Table 2: Incidence of malignant brain and CNS cancer by sex and year of diagnosis: 2007-2016

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Male	83	85	84	96	73	85	82	98	84	80
Female	54	55	55	52	43	62	74	61	58	52
Both sexes	137	140	139	148	116	147	156	159	142	132

Non-malignant cancer of the brain and nervous system is more common in females than males but the trend is reversed for malignant brain tumours with males more commonly affected. The reasons for such differences are complex and still poorly understood but it is possible that variations in hormone levels account for the higher rate of non-malignant brain tumours such as meningioma in women. Non-malignant cancers of the brain are more common than malignant ones in both genders.

After accounting for the increasing number of older people in the NI population, incidence of invasive brain cancer has remained stable in men and women; however, there have been changes in the incidence of non-invasive brain cancer in both genders during the previous twenty four-year period (Figure 1).

Figure 1: Male (left) and female (right) 24-year trend in both types of brain cancer incidence rates: 1993-2016

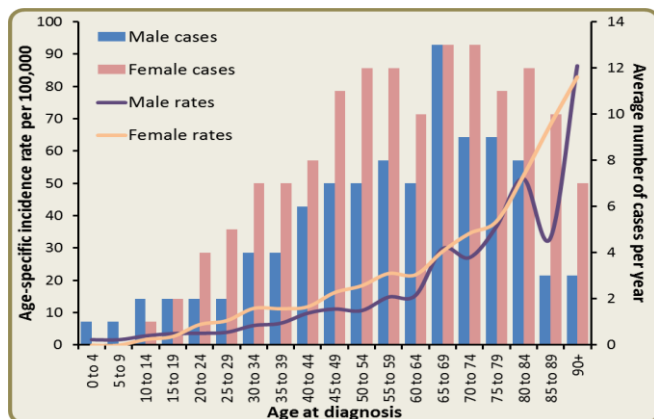


Incidence and age

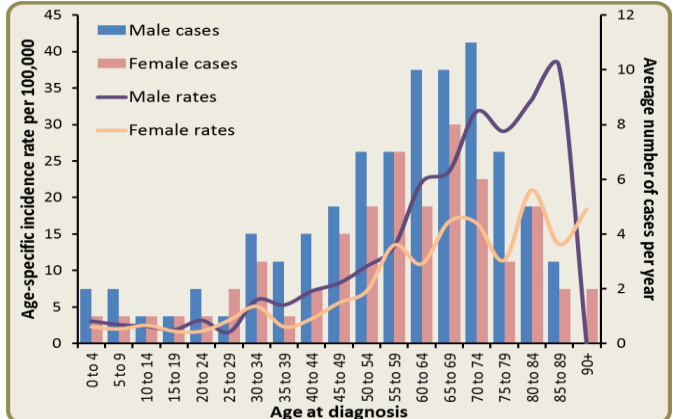
Incidence of both types of brain cancer increases with age. Female incidence rates are consistently higher than males incidence rates for non-malignant brain and central nervous system cancer at all ages with peak incidence rates for both genders seen in the later years of life. Male incidence rates are consistently higher than female incidence rates for malignant cancer of the brain and nervous system between the ages of 35 and 89. Thereafter, a greater number of women are diagnosed due to differences in life expectancy between genders. Data is visually represented below (non-malignant incidence by age and sex on left and malignant incidence by age and sex on right).

Figure 2: Incidence of brain and CNS cancer by age, sex, and type: 2012-2016:

Non-malignant brain cancer graph



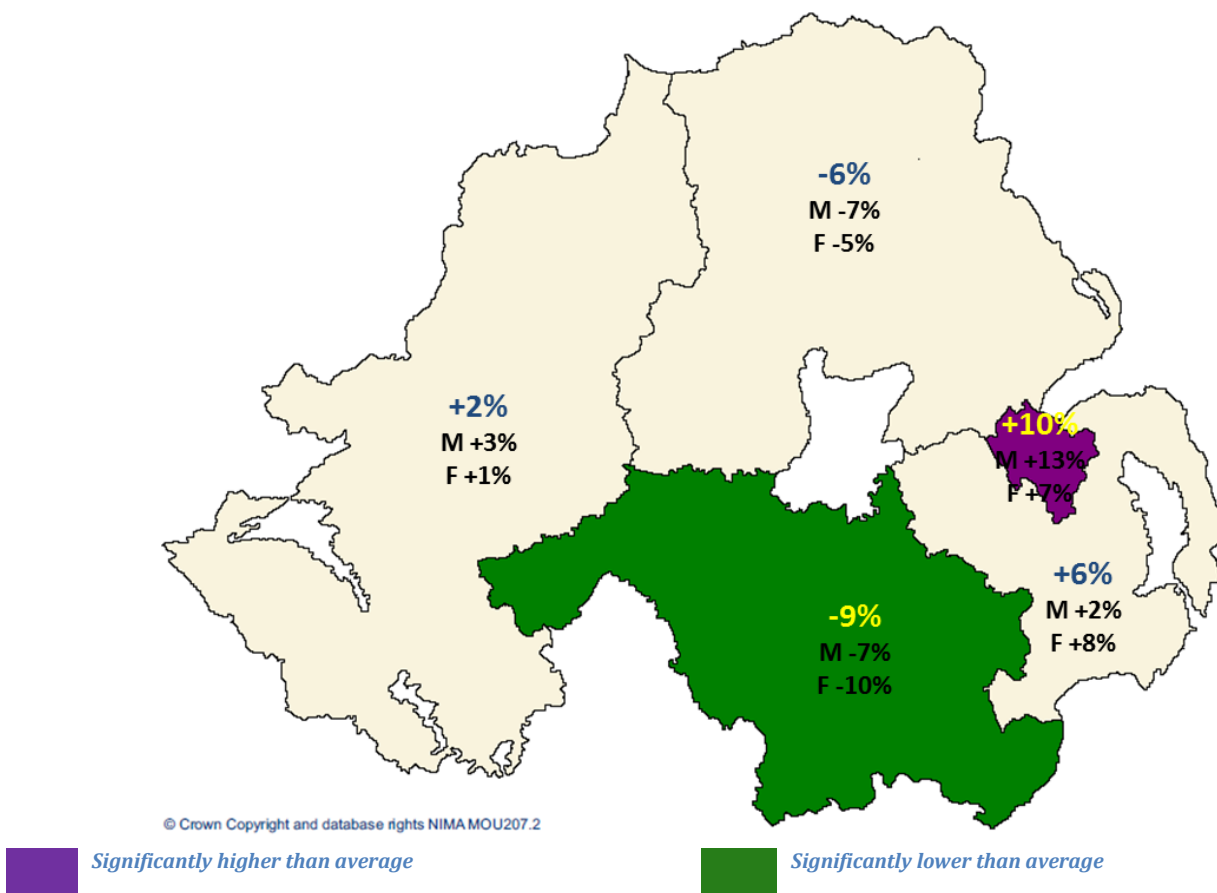
Malignant brain cancer graph



Incidence by Trust area

Non-malignant brain and central nervous system cancer incidence rates in 2007-2016 among people living within the Belfast health and social care trust (HSCT) area were 10% higher than the NI average. In the same period the incidence rates for people living within the Southern health and social trust (HSCT) area were 9% lower than the NI average. There were no statistically different differences in the incidence rate of malignant brain and central nervous system cancers in any trust area when compared with the NI average.

Figure 3: Non-malignant brain and nervous system cancer incidence rates compared to the NI average by health and social care trust of residence: 2007-2016



Incidence by deprivation

Incidences of both types of brain and central nervous system cancer were not strongly associated with social deprivation although some inter-quintile differences do exist. Patients in quintile 4 have a lower than average incidence of non-malignant brain and nervous system cancer whilst patients in quintile 2 (particularly males) have a higher than average incidence of non-malignant brain and nervous system cancer when compared to the NI average.

- Patients in quintile 4 are 5% less likely to develop non-malignant brain cancer
- Patients in quintile 2 are 7% more likely to develop non-malignant brain cancer

SURVIVAL

Patients diagnosed with a non-malignant cancer of the brain or nervous system are more likely to survive longer than patients diagnosed with a malignant cancer of the brain or nervous system. Females are likely to survive longer than males regardless of which type of brain or nervous system cancer they have been diagnosed with.

Table 3: Five-year non-malignant brain and CNS cancer survival by time and sex

Time since diagnosis	Diagnosed 2006-2010		
	Male	Female	Both sexes
6 months	94.6%	96.0%	95.5%
1 year	93.6%	95.0%	94.4%
5 years	90.7%	92.8%	92.0%

Table 4: Five-year malignant brain and CNS cancer survival by time and sex

Time since diagnosis	Diagnosed 2006-2010		
	Male	Female	Both sexes
6 months	61.4%	62.4%	62.1%
1 year	43.1%	45.5%	44.2%
5 years	24.0%	24.8%	24.5%

Survival Trends

Five-year survival for non-malignant brain and nervous system cancer has improved from the 1993-2000 diagnosis period to the 2006-2010 diagnosis period; increasing for men from 87.2% to 90.7%, and for women from 85.9% to 92.8%. Similar improvements in five-year survival rates are seen in malignant cancers of the brain and nervous system. In 1993-2000 a mere 16.3% of men diagnosed with malignant brain cancer survived to five years after diagnosis. This increased to 24.0% of men in 2006-2010. Female survival rates from malignant cancer followed a similar trend but to a lesser extent than men. In 2006-2010 about 1 in 4 patients diagnosed with malignant brain cancer survived for five years after diagnosis.

Table 5: Five-year non-malignant brain and CNS cancer survival by period of diagnosis and sex

Period of diagnosis	Male	Female	Both sexes
1993-2000	87.2%	85.9%	86.6%
2001-2005	93.3%	90.5%	91.8%
2006-2010	90.7%	92.8%	92.0%

Table 6: Five-year malignant brain and CNS cancer survival by period of diagnosis and sex

Period of diagnosis	Male	Female	Both sexes
1993-2000	16.3%	22.0%	18.9%
2001-2005	22.2%	24.2%	23.1%
2006-2010	24.0%	24.8%	24.5%

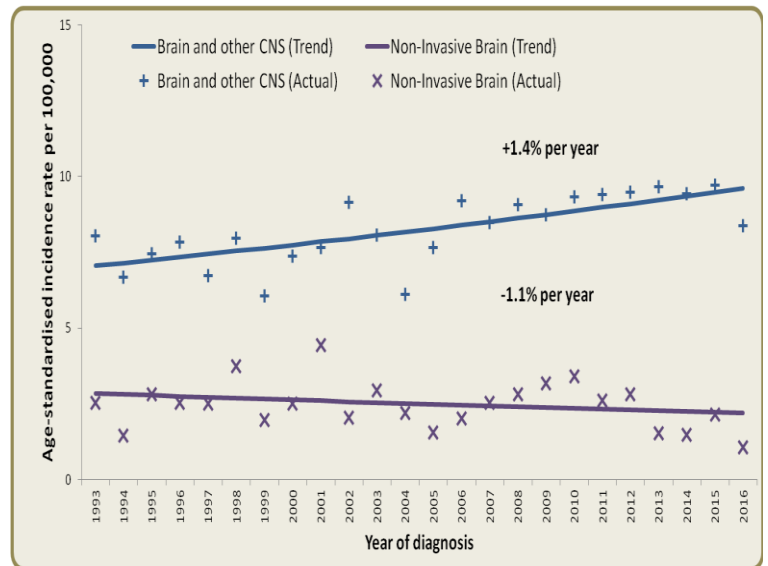
MORTALITY

In 2012-2016 there were an average of 11 male and 12 female deaths from non-malignant brain and nervous system cancer each year. This contrasts with malignant brain cancer deaths during the same period where an average of 70 males and 44 females died each year.

Mortality trends

The number of non-malignant brain cancer deaths has decreased from a total of 34 (15 in men and 19 in women) in 2007 to 17 (7 in men and 10 in women) in 2016. Numbers of malignant brain cancer deaths has increased from a total of 94 in 2007 (59 in men and 35 in women) to 111 (65 in men and 46 in women) in 2016. When adjusted for age and population change, mortality rates have remained stable in women whilst for men invasive brain mortality rates have increased by +1.4% each year since 1993 (figure 4).

Figure 4: Trends in male brain cancer mortality rates



PREVALENCE

At the end of 2016 there were 5,393 people living in Northern Ireland who had been diagnosed with a form of brain or nervous system cancer. Of these people, 4,765 were living with non-malignant cancer whilst 628 were living with malignant cancer. Almost one third of all adults living with a diagnosis of brain cancer in Northern Ireland are under the age of 50 and 5.8% had been diagnosed the previous year.

Table 7: Number of people of both genders living with brain and CNS cancer at the end of 2016 who were diagnosed from 1993-2016 divided into non-malignant and malignant subtypes

Type	Age	Time since diagnosis				24-year Prevalence
		0-1 year	1-5 years	5-10 years	10-21 years	
Non-malignant	0-69	166	514	1,017	1,590	3,287
	70+	62	249	378	789	1,478
	All ages	228	763	1,395	2,379	4,765
Malignant	0-69	65	157	130	212	564
	70+	18	15	9	22	64
	All ages	83	172	139	234	628

FURTHER INFORMATION

Further data is available from the Northern Ireland Cancer Registry web site: www.qub.ac.uk/nicr

NI Cancer Registry

Phone: +44 (0)28 9097 6028
e-mail: nicr@qub.ac.uk



ACKNOWLEDGEMENTS

NICR is funded by the Public Health Agency and is hosted by Queen's University, Belfast. This work uses data provided by patients and collected by the NHS as part of their care and support.

