

Brain tumours

(Malignant and non-invasive)

Patients diagnosed 1993-2019

(ICD10: C70-C72, C75.1-C75.3, D32-D33, D35.2-D35.4, D42-D43, D44.3-D44.5)

Further information

Further data is available at: www.qub.ac.uk/research-centres/nicr

Phone: +44 (0)28 9097 6028

e-mail: nicr@qub.ac.uk

Acknowledgements

The Northern Ireland Cancer Registry (NICR) is funded by the Public Health Agency and is based in Queen's University, Belfast. NICR uses data provided by patients and collected by the health service as part of their care and support.

The incidence, prevalence and survival statistics in this publication are designated as official statistics signifying that they comply with the Code of Practice for Official Statistics.



Incidence

During 2015-2019:

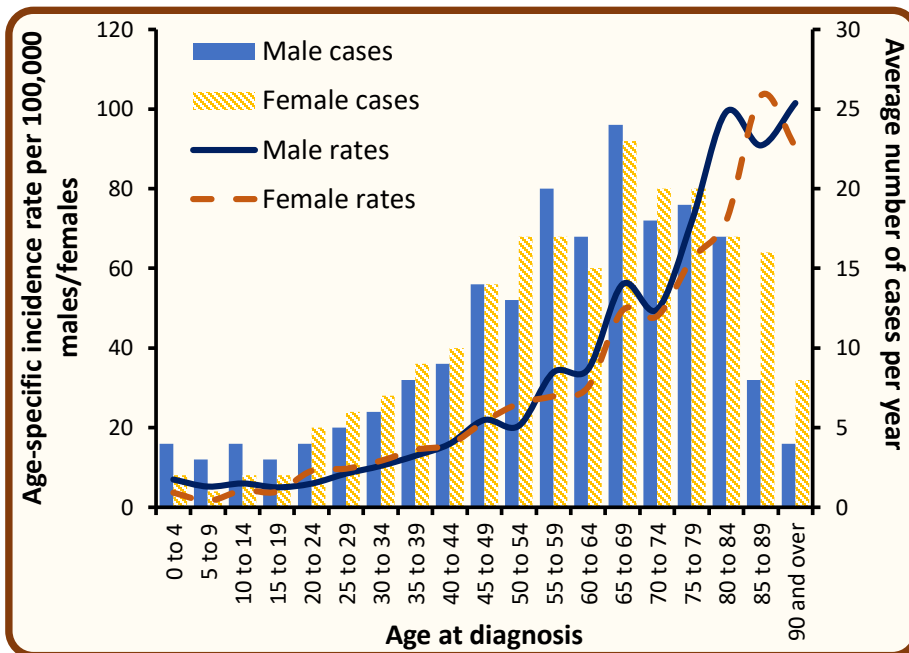
- There were 201 male and 212 female brain tumours (malignant and non-invasive) diagnosed each year.
- The risk of developing a brain tumour before the age of 75 was 1 in 68.7 for men and 1 in 72.7 for women, while before the age of 85 the risk was 1 in 43.6 for men and 1 in 49.1 for women.

Incidence by age at diagnosis - Brain tumours (malignant and non-invasive), Cases in 2015-2019

During 2015-2019:

- The median age at diagnosis was 61 for men and 64 for women.
- Cancer risk increased with age, with 23.9% of men and 28.8% of women aged 75 years or more at diagnosis.
- 29.1% of cases were diagnosed among those aged under 50.

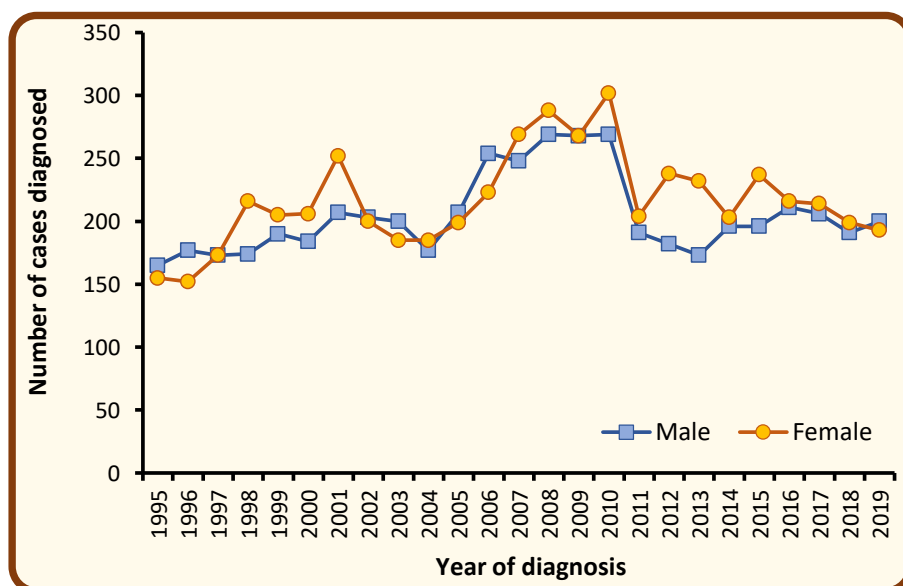
Age at diagnosis	Average cases per year		
	Male	Female	Both sexes
0 - 49	60	58	120
50 - 64	50	49	100
65 - 74	42	43	85
75 +	48	61	108
All ages	201	212	413



Incidence by year of diagnosis - Brain tumours (malignant and non-invasive), Cases in 1995-2019

- Among males the number of brain tumours decreased by 0.5% from an annual average of 202 cases in 2010-2014 to 201 cases in 2015-2019.
- Among females the number of cases of brain tumours decreased by 10.2% from an annual average of 236 cases in 2010-2014 to 212 cases in 2015-2019.

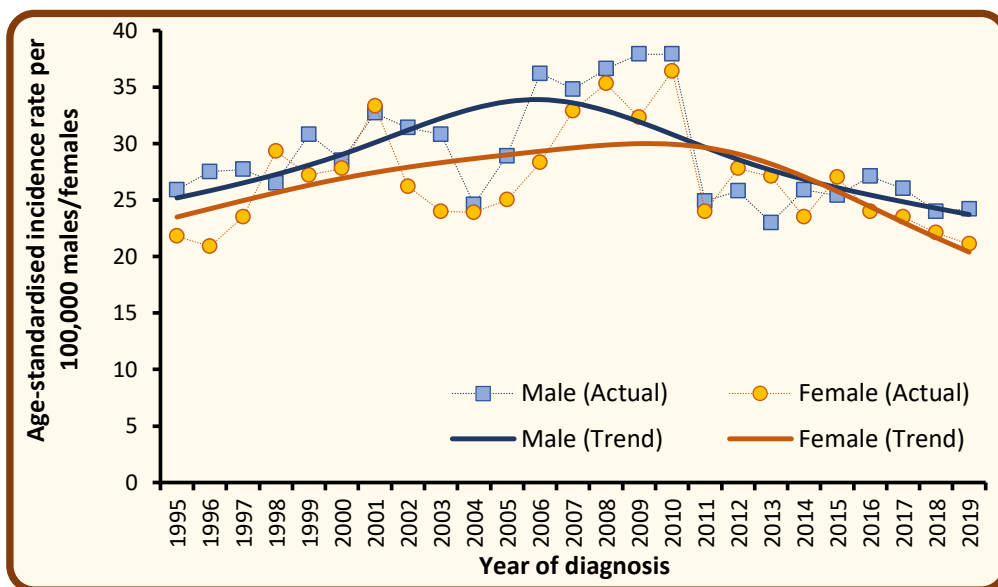
Year of diagnosis	Male	Female	Both sexes
2010	269	302	571
2011	191	204	395
2012	182	238	420
2013	173	232	405
2014	196	203	399
2015	196	237	433
2016	211	216	427
2017	206	214	420
2018	191	199	390
2019	200	193	393



Note: Annual averages based upon several years have been rounded to the nearest integer. Sums of numbers in table rows or columns may thus differ slightly from the given total.

Trends in age-standardised incidence rates - Brain tumours (malignant and non-invasive), Cases in 1995-2019

- Among males age-standardised incidence rates of brain tumours decreased by 7.7% from 27.4 per 100,000 person years in 2010-2014 to 25.3 cases per 100,000 persons years in 2015-2019. This difference was not statistically significant.
- Among females age-standardised incidence rates of brain tumours decreased by 15.2% from 27.7 per 100,000 person years in 2010-2014 to 23.5 cases per 100,000 persons years in 2015-2019. This difference was statistically significant.



Age-standardised incidence rates illustrate the change in the number of cases within a population of a fixed size and age structure (2013 European Standard).

They thus represent changes other than those caused by population growth and/or ageing.

Trends can also be influenced by changes in how cancer is classified and coded. (e.g. the move from ICD-0-2 to ICD-0-3

Incidence by deprivation quintile - Brain tumours (malignant and non-invasive), Cases in 2015-2019

The annual number of cases during 2015-2019 varied in each deprivation quintile due to variations in population size and age.

After accounting for these factors, incidence rates:

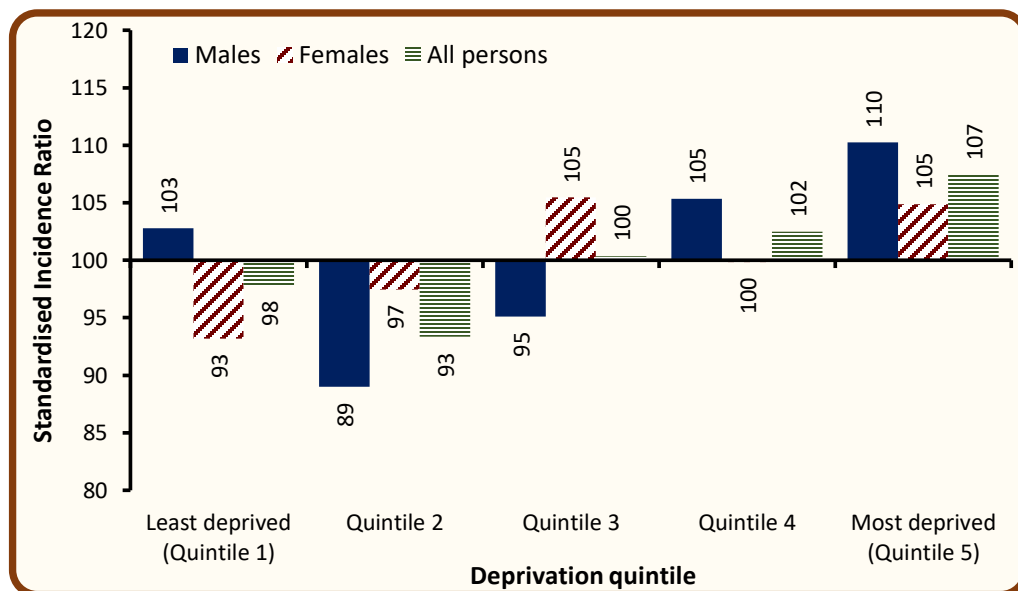
- in the most socio-economically deprived areas did not vary significantly from the NI average.
- in the least socio-economically deprived areas did not vary significantly from the NI average.

Deprivation quintile	Average cases per year		
	Male	Female	Both sexes
Least deprived (Quintile 1)	42	41	83
Quintile 2	38	43	81
Quintile 3	41	46	87
Quintile 4	43	43	85
Most deprived (Quintile 5)	38	39	76
Northern Ireland	201	212	413

Standardised incidence ratios compare incidence rates in each deprivation quintile with the Northern Ireland incidence rate.

A value above 100 means that incidence rates in that deprivation quintile are greater than the Northern Ireland average.

This measure takes account of population size and age structure. Differences are thus not a result of these factors.



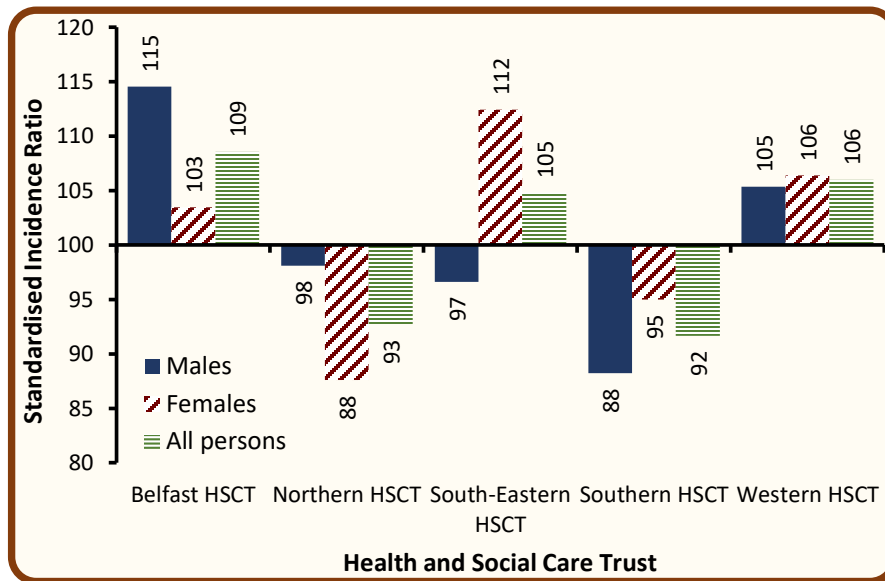
Incidence by Health and Social Care Trust (HSCT) - Brain tumours (malignant and non-invasive), Cases in 2015-2019

The annual number of cases during 2015-2019 varied in each HSCT due to variations in population size and age.

After accounting for these factors, incidence rates:

- in Belfast HSCT did not vary significantly from the NI average.
- in Northern HSCT did not vary significantly from the NI average.
- in South-Eastern HSCT did not vary significantly from the NI average.
- in Southern HSCT did not vary significantly from the NI average.
- in Western HSCT did not vary significantly from the NI average.

Health and Social Care Trust	Average cases per year		
	Male	Female	Both sexes
Belfast HSCT	41	42	84
Northern HSCT	52	48	100
South-Eastern HSCT	39	49	88
Southern HSCT	35	38	73
Western HSCT	34	35	69
Northern Ireland	201	212	413



Standardised incidence ratios compare incidence rates in each HSC Trust with the Northern Ireland incidence rate. A value above 100 means that incidence rates in that HSC Trust are greater than the NI average.

This measure takes account of population size and age structure. Differences are thus not a result of these factors.

Data for Local Government Districts and Parliamentary Constituencies are available at www.qub.ac.uk/research-centres/nicr

Survival

▪ 38.0% of brain cancer patients were alive one year and 19.8% were alive five years from a diagnosis in 2010-2014, while 91.7% of non-invasive brain tumour patients survived one year and 78.5% survived five years. (observed survival)

▪ Age-standardised net survival (ASNS), which removes the effect of deaths from causes unrelated to cancer, was 44.9% one year and 24.7% five years from a brain cancer diagnosis in 2010-2014 compared to 94.8% one year and 89.4% five years from a non-invasive brain tumour diagnosis in the same period.

Gender	Brain cancer				Non-invasive brain tumours			
	Observed survival		Age-standardised net survival		Observed survival		Age-standardised net survival	
	One-year	Five-years	One-year	Five-years	One-year	Five-years	One-year	Five-years
Male	38.3%	17.6%	42.9%	20.8%	91.8%	79.5%	94.7%	90.0%
Female	37.7%	23.1%	47.8%	31.4%	91.6%	77.9%	94.8%	89.0%
Both sexes	38.0%	19.8%	44.9%	24.7%	91.7%	78.5%	94.8%	89.4%

Observed survival is the proportion of patients still alive one/five years after diagnosis. However, in this measure patients may have died from causes unrelated to their cancer.

Age-standardised net survival is the proportion of patients who would survive if the patient could not die from causes unrelated to their cancer. This measure is more typically used in studies of cancer survival.

Prevalence

- At the end of 2019, there were 5,575 people (Males: 2,501; Females: 3,074) living with brain tumours who had been diagnosed with the disease during 1995-2019.
- Of these, 44.9% were male, 21.8% were aged 75 and over, and 5.7% had been diagnosed in the previous year.

25-year prevalence refers to the number of cancer survivors who were alive at the end of 2019, and had been diagnosed with their cancer in the previous 25 years (i.e. 1995-2019).

Time since diagnosis	25-year prevalence								
	Aged 0-74			Aged 75+			All ages		
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
0-1 year	122	129	251	28	38	66	150	167	317
1-5 years	384	435	819	87	133	220	471	568	1,039
5-10 years	380	529	909	109	153	262	489	682	1,171
10-25 years	1,089	1,293	2,382	302	364	666	1,391	1,657	3,048
0-25 years	1,975	2,386	4,361	526	688	1,214	2,501	3,074	5,575

Trends in 10-year prevalence - Brain tumours (malignant and non-invasive), Patients alive at end of each year from 2010-2019

- Among males the number of survivors from brain tumours who had been diagnosed within the previous ten years decreased by 19.6% from 1,380 survivors in 2014 to 1,110 survivors in 2019.
- Among females the number of survivors from brain tumours who had been diagnosed within the previous ten years decreased by 16.9% from 1,706 survivors in 2014 to 1,417 survivors in 2019.

Year	10-year prevalence		
	Male	Female	Both sexes
2010	1,506	1,735	3,241
2011	1,483	1,679	3,162
2012	1,448	1,698	3,146
2013	1,413	1,720	3,133
2014	1,380	1,706	3,086
2015	1,346	1,699	3,045
2016	1,312	1,667	2,979
2017	1,262	1,594	2,856
2018	1,175	1,500	2,675
2019	1,110	1,417	2,527

Mortality

- During 2015-2019 there were 84 male and 60 female deaths from brain tumours each year.
- The median age at death during 2015-2019 was 67 for men and 70 for women.

Deaths by year of death - Brain tumours (malignant and non-invasive), Deaths in 2010-2019

- The number of deaths from brain tumours increased by 3.6% from an annual average of 138 deaths in 2010-2014 to 143 deaths in 2015-2019.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
All persons	143	134	138	136	138	142	132	153	152	138

Background notes

Cancer classification: Classification of tumour sites is carried out using ICD10 codes. For a listing and explanation of ICD10 codes see: World Health Organisation at <http://apps.who.int/classifications/icd10/browse/2010/en#/II>

Population data for Northern Ireland, and smaller geographic areas, are extracted from the NI mid-year population estimates available from the NI Statistics and Research Agency (available at www.nisra.gov.uk).

Geographic areas are assigned based on a patient's postcode of usual residence at diagnosis using the Jan 2021 Central Postcode Directory (CPD) produced by the NI Statistics and Research Agency (available at www.nisra.gov.uk).

Deprivation quintiles: Super output areas (SOA) are assigned to each patient based on their postcode of usual residence at diagnosis. Using the SOA each patient is assigned a socio-economic deprivation quintile based on the 2017 Multiple Deprivation Measure. The 2017 Multiple Deprivation Measure is available from the NI Statistics and Research Agency (available at www.nisra.gov.uk).

A **crude incidence/mortality rate** is the number of cases/deaths per 100,000 person years in the population. Person years are the sum of the population over the number of years included.

An **age-standardised incidence/mortality rate** per 100,000 person years is an estimate of the incidence/mortality rate if that population had a standard age structure. Throughout this report the 2013 European Standard Population has been used. Standardising to a common Standard Population allows comparisons of incidence/mortality rates to be made between different time periods and geographic areas while removing the effects of population change and ageing.

A **Standardised Incidence/Mortality Ratio (SIR/SMR)** is the ratio of the number of cases/deaths observed in a population to the expected number of cases/deaths, based upon the age-specific rates in a reference population. This statistic is often used to compare incidence/mortality rates for geographic areas (e.g. Trusts) to the national incidence/mortality rates (i.e. Northern Ireland). An SIR/SMR of 100 indicates there is no difference between the geographic area and the national average.

Confidence intervals are a measure of the precision of a statistic (e.g. brain tumours incidence rate). Typically, when numbers are low, precision is poorer and confidence intervals will be wider. As a general rule, when comparing statistics (e.g. cervical cancer incidence rate in year 2012 vs year 2013), if the confidence interval around one statistic overlaps with the interval around another, it is unlikely that there is any real difference between the two. If there is no overlap, the difference is considered to be **statistically significant**.

Lifetime risk is estimated as the cumulative risk of getting cancer up to age 75/85, calculated directly from the age-specific incidence rates. The odds of developing the disease before age 75/85 is the inverse of the cumulative risk.

Prevalence is the number of cancer patients who are alive in the population on a specific date (31st December 2019 in this report). Since data from the NI Cancer Registry are only available since 1993, prevalence only refers to a fixed term (10 and 25 years in this report). There may be members of the population living with a diagnosis of cancer for more than 25 years.

Observed survival refers to the proportion of patients who survive a specified amount of time from their date of diagnosis. Observed survival considers death from any cause and is not adjusted for the age of the patient. Cause of death may be unrelated to the cancer the patient has been diagnosed with.

Net Survival is an estimate of survival where the effect on survival of background population mortality rates has been removed. It represents the [theoretical] survival of cancer patients if they could only die from cancer-related causes. Age-standardised net survival estimates are the estimates that would occur if that population of cancer patients had a standard population age structure. The age groups and weights used here are those used by international studies such as EUROCARE, an international study group that compares cancer survival among European countries. However, due to the small number of patients in NI, the last two age categories in the standard population are combined.

Mortality: Information relating to cancer mortality is sourced from the General Registrar Office (GRONI) via the Department of Health (NI). Results are based upon the date on which death occurs, and may thus differ slightly than those produced by the Northern Ireland Statistics and Research Agency (NISRA), which produces deaths data based upon the date on which the death is registered with GRONI.