

Brain cancer

(Including other central nervous system)

Patients diagnosed 1993-2019
(ICD10: C70-C72, C75.1-C75.3)

Further information

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

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Acknowledgements

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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:

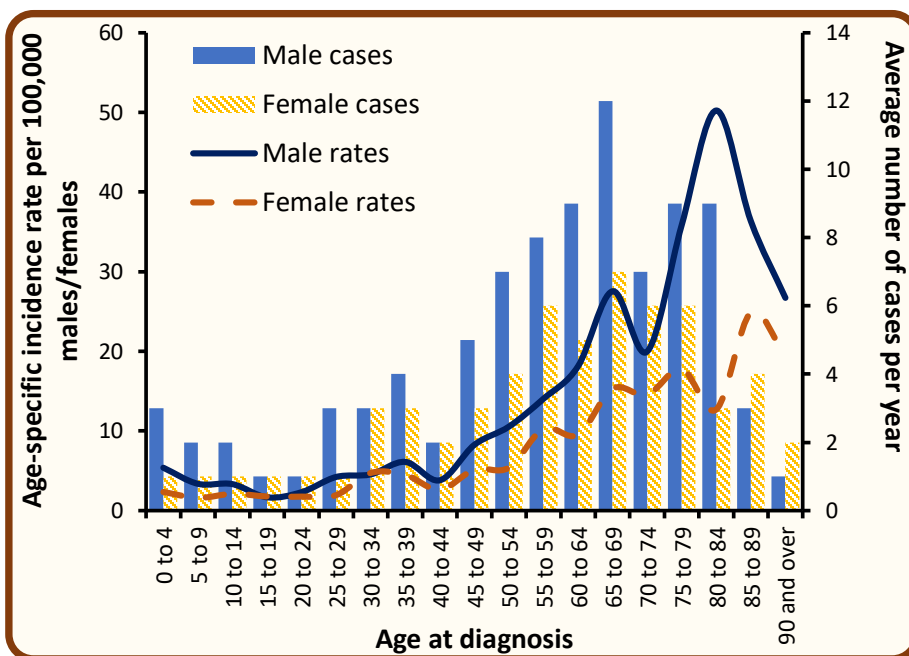
- There were 92 male and 59 female cases of brain cancer diagnosed each year.
- Brain cancer made up 1.8% of all male, and 1.2% of all female cancers (ex NMSC).
- The risk of developing brain cancer before the age of 75 was 1 in 151.3 for men and 1 in 242.8 for women, while before the age of 85 the risk was 1 in 92.0 for men and 1 in 177.4 for women.

Incidence by age at diagnosis - Brain cancer, Cases in 2015-2019

During 2015-2019:

- The median age at diagnosis was 62 for men and 63 for women.
- Cancer risk varied by age, with 23.9% of men and 25.4% of women aged 75 years or more at diagnosis.
- 35.3% of cases were diagnosed among those aged under 55.

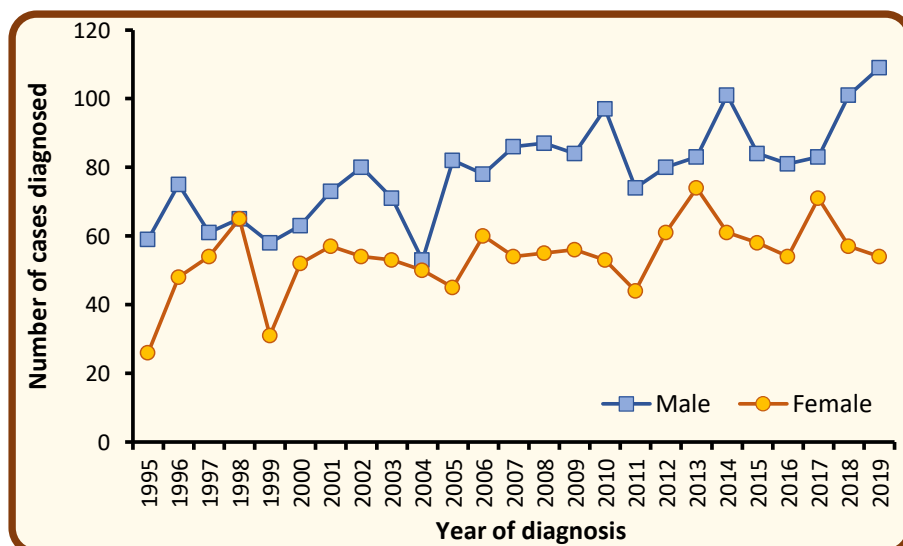
Age at diagnosis	Average cases per year		
	Male	Female	Both sexes
0 - 54	33	21	53
54 - 64	17	11	28
65 - 74	19	13	32
75 +	22	15	37
All ages	92	59	150



Incidence by year of diagnosis - Brain cancer, Cases in 1995-2019

- Among males the number of cases of brain cancer increased by 5.7% from an annual average of 87 cases in 2010-2014 to 92 cases in 2015-2019.
- Among females the number of cases of brain cancer did not change between 2010-2014 and 2015-2019 with an annual average of 59 cases in both five-year periods.

Year of diagnosis	Male	Female	Both sexes
2010	97	53	150
2011	74	44	118
2012	80	61	141
2013	83	74	157
2014	101	61	162
2015	84	58	142
2016	81	54	135
2017	83	71	154
2018	101	57	158
2019	109	54	163

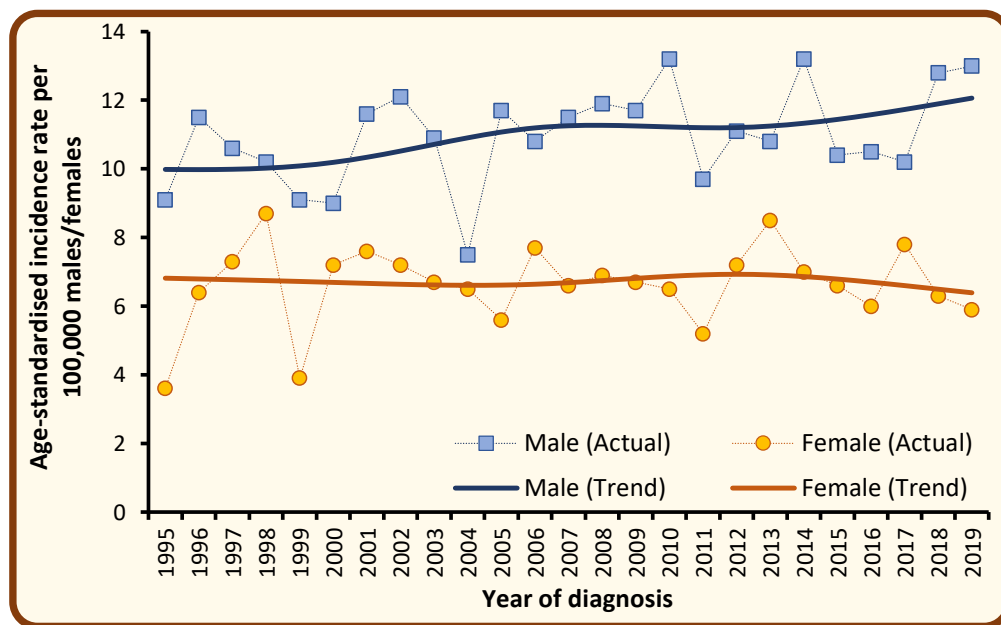


Note: Annual averages have been rounded to the nearest integer. Sums of numbers in table rows or columns may thus differ slightly from the given total.

NMSC: Non-melanoma skin cancer

Trends in age-standardised incidence rates - Brain cancer, Cases in 1995-2019

- Among males age-standardised incidence rates of brain cancer decreased by 1.7% from 11.6 per 100,000 person years in 2010-2014 to 11.4 cases per 100,000 persons years in 2015-2019. This difference was not statistically significant.
- Among females age-standardised incidence rates of brain cancer decreased by 5.8% from 6.9 per 100,000 person years in 2010-2014 to 6.5 cases per 100,000 persons years in 2015-2019. This difference was not 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 in 2019).

Incidence by deprivation quintile - Brain cancer, 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:

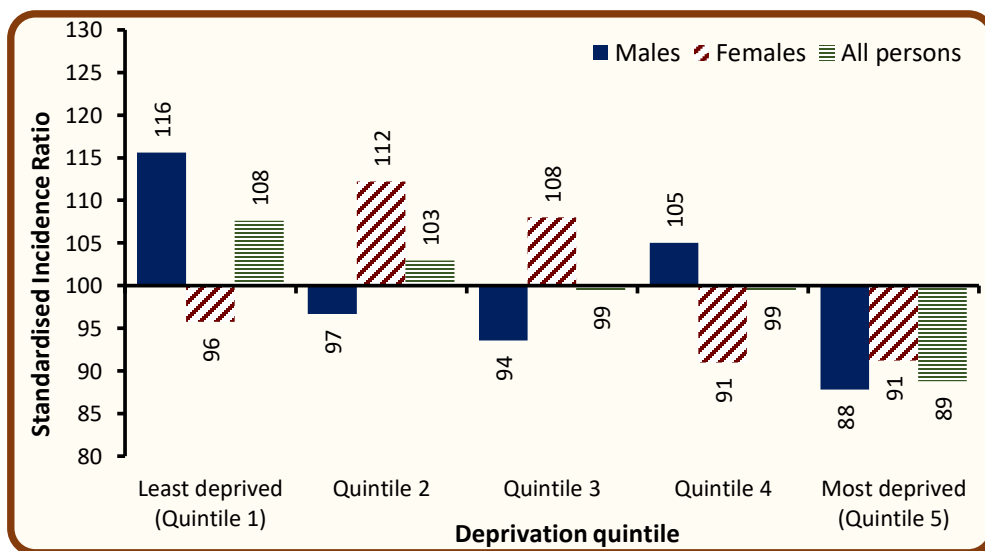
- in the most socio-economically deprived areas did not vary significantly from the NI average.
- in the least socio-economically deprived areas did not vary significantly from the NI average.

Deprivation quintile	Average cases per year		
	Male	Female	Both sexes
Least deprived (Quintile 1)	21	12	33
Quintile 2	19	14	33
Quintile 3	18	13	31
Quintile 4	19	11	30
Most deprived (Quintile 5)	14	9	23
Northern Ireland	92	59	150

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.



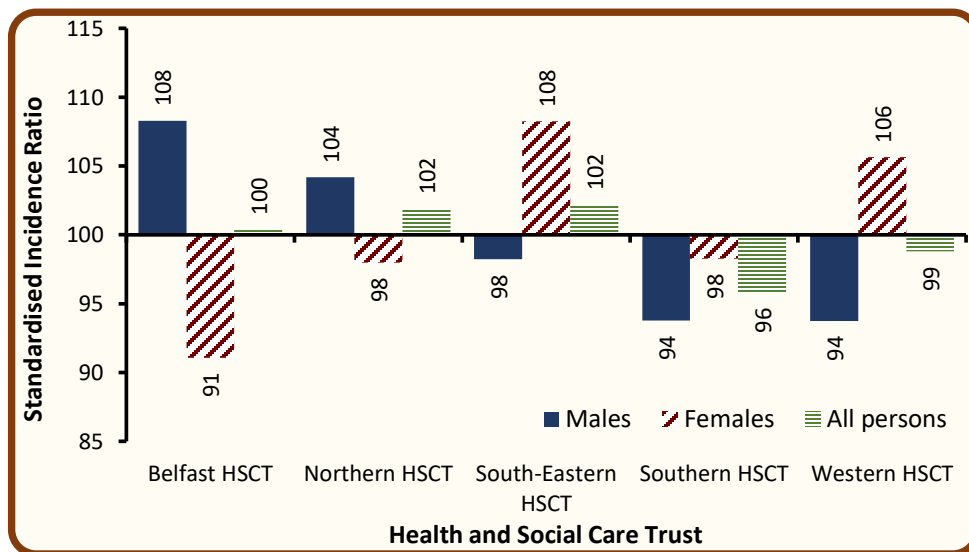
Incidence by Health and Social Care Trust (HSCT) - Brain cancer, Cases in 2015-2019

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	18	10	28
Northern HSCT	25	15	40
South-Eastern HSCT	18	13	31
Southern HSCT	17	11	28
Western HSCT	14	10	23
Northern Ireland	92	59	150



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.

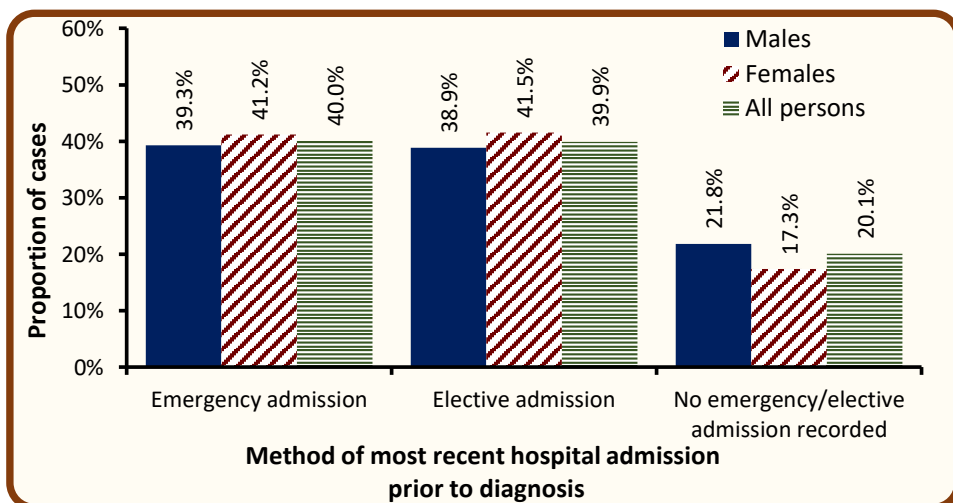
Data for Local Government Districts and Parliamentary Constituencies are available at www.qub.ac.uk/research-centres/nicr

Incidence by method of most recent admission to hospital - Brain cancer, Cases in 2015-2019

During 2015-2019:

- 40.0% of cases had an emergency admission to hospital recorded up to 30 days prior to their cancer diagnosis.
- 39.3% of male cases had an emergency admission up to 30 days prior to diagnosis, compared to 41.2% of female cases.
- In 20.1% of diagnosed cases there was no record of a hospital inpatient admission up to 30 days prior to diagnosis.

Method of admission	Average cases per year		
	Male	Female	Both sexes
Emergency admission	36	24	60
Elective admission	36	24	60
No emergency/elective admission recorded	20	10	30
Total	92	59	150



Admission method refers to the most recent hospital inpatient admission that a patient had prior to cancer diagnosis, regardless of reason for the admission.

Admissions are considered up to a maximum of 30 days prior to diagnosis. Admissions up to two days post diagnosis are also considered to allow for a reasonable margin or error in data recording.

The majority of patients with no inpatient admission recorded prior to diagnosis are likely to have been diagnosed via an outpatient route.

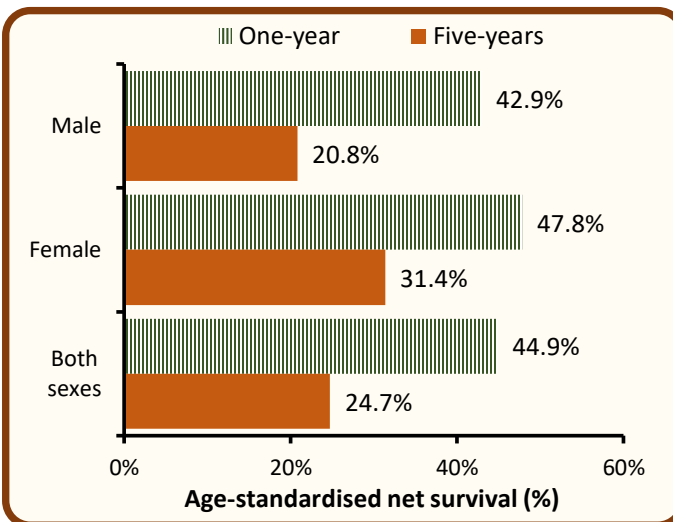
Survival

- 38.0% of patients were alive one year and 19.8% were alive five years from a brain cancer diagnosis in 2010-2014. (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.
- Five-year survival (ASNS) for brain cancer patients diagnosed in 2010-2014 was 20.8% among men and 31.4% among women.

Gender	Observed survival		Age-standardised net survival	
	One-year	Five-years	One-year	Five-years
Male	38.3%	17.6%	42.9%	20.8%
Female	37.7%	23.1%	47.8%	31.4%
Both sexes	38.0%	19.8%	44.9%	24.7%

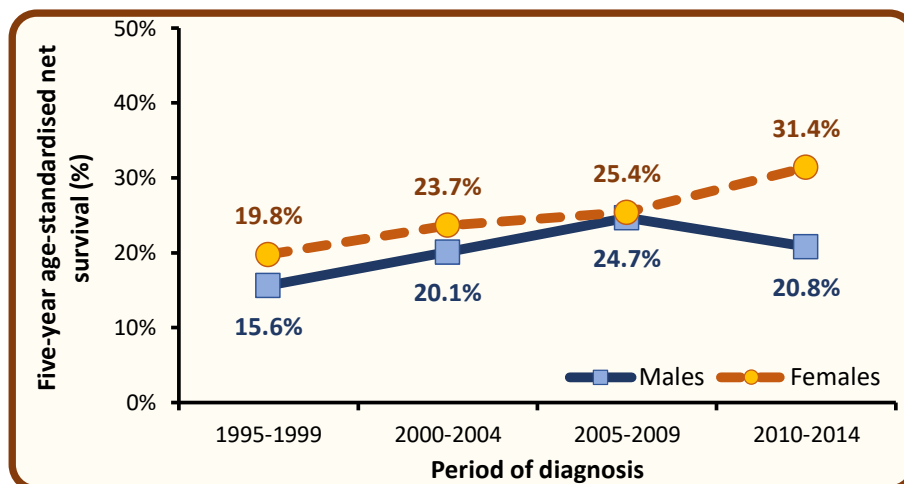
Observed survival is the proportion of patients still alive one/five years after diagnosis. However, in this measure patients may have died from causes unrelated to their cancer.

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.



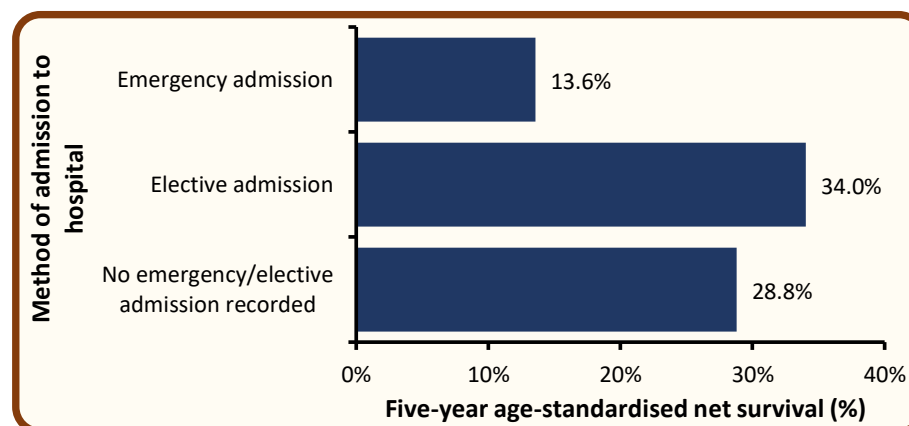
Trends in survival - Brain cancer, Patients diagnosed in 1995-2014

- Among men five-year survival (ASNS) from brain cancer decreased from 24.7% in 2005-2009 to 20.8% in 2010-2014. This difference was not statistically significant.
- Among women five-year survival (ASNS) from brain cancer increased from 25.4% in 2005-2009 to 31.4% in 2010-2014. This difference was not statistically significant.



Survival by method of most recent admission to hospital - Brain cancer, Patients diagnosed in 2010-2014

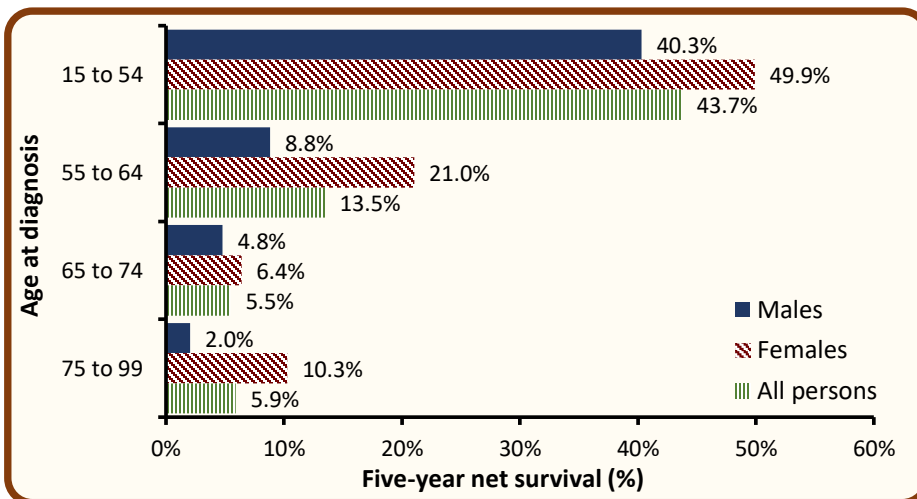
- Five-year survival (ASNS) among brain cancer patients who had an emergency admission to hospital up to 30 days prior to their cancer diagnosis was 13.6% compared to 34.0% among those with elective admissions and 28.8% among those who had no hospital admissions recorded up to 30 days prior to diagnosis.



Survival by age at diagnosis - Brain cancer, Patients diagnosed in 2010-2014

Survival from brain cancer among patients diagnosed in 2010-2014 was strongly related to age with better five-year survival among younger age groups. In particular:

- Five-year net survival was 43.7% among patients aged 15 to 54 at diagnosis, compared to 5.9% among those aged 75 and over.
- Five-year net survival among patients aged 75 and over was 2.0% for men and 10.3% for women.



Prevalence

- At the end of 2019, there were 678 people (Males: 382; Females: 296) living with brain cancer who had been diagnosed with the disease during 1995-2019.
- Of these, 56.3% were male, 16.2% were aged 65 and over, and 15.3% 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 0-64			Aged 65+			All ages		
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
0-1 year	46	22	68	20	16	36	66	38	104
1-5 years	84	62	146	11	9	20	95	71	166
5-10 years	70	52	122	6	15	21	76	67	143
10-25 years	127	105	232	18	15	33	145	120	265
0-25 years	327	241	568	55	55	110	382	296	678

Trends in 10-year prevalence - Brain cancer, Patients alive at end of each year from 2010-2019

- Among males the number of survivors from brain cancer who had been diagnosed within the previous ten years decreased by 3.3% from 245 survivors in 2014 to 237 survivors in 2019.
- Among females the number of survivors from brain cancer who had been diagnosed within the previous ten years increased by 4.1% from 169 survivors in 2014 to 176 survivors in 2019.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Male	229	225	221	223	245	237	235	226	223	237
Female	163	153	156	165	169	176	169	175	169	176
Both sexes	392	378	377	388	414	413	404	401	392	413

Mortality

- During 2015-2019 there were 73 male and 46 female deaths from brain cancer each year.
- Brain cancer made up 3.1% of all male, and 2.2% of all female cancer deaths (ex NMSC).

Deaths by age at death - Brain cancer, Deaths in 2015-2019

- The median age at death during 2015-2019 was 66 for men and 67 for women.
- Risk of death from brain cancer was strongly related to patient age, with 28.8% of men and 30.4% of women aged 75 years or more at time of death.
- 23.5% of brain cancer deaths occurred among those aged under 55.

Age at death	Average deaths per year		
	Male	Female	Both sexes
0 - 54	20	10	28
55 - 64	15	11	26
65 - 74	17	13	29
75 +	21	14	35
All ages	73	46	119

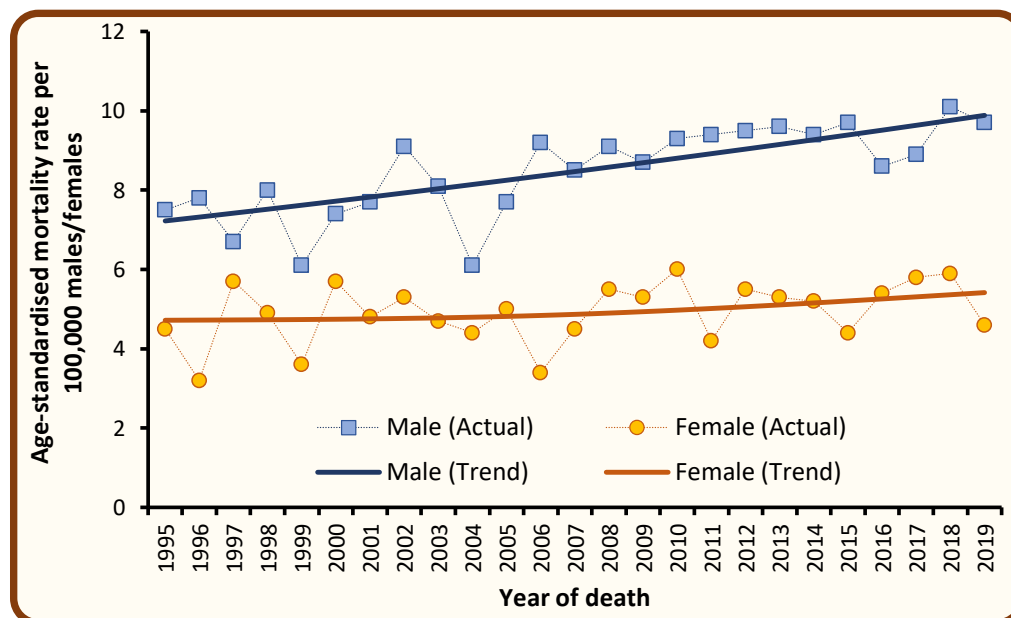
Deaths by year of death - Brain cancer, Deaths in 2010-2019

- Among males the number of deaths from brain cancer increased by 7.4% from an annual average of 68 deaths in 2010-2014 to 73 deaths in 2015-2019.
- Among females the number of deaths from brain cancer increased by 4.5% from an annual average of 44 deaths in 2010-2014 to 46 deaths in 2015-2019.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Male	65	67	69	70	70	74	67	69	78	76
Female	49	34	46	44	45	37	47	52	52	42
Both sexes	114	101	115	114	115	111	114	121	130	118

Trends in age-standardised mortality rates - Brain cancer, Deaths in 1995-2019

- Among males age-standardised mortality rates from brain cancer decreased by 1.1% between 2010-2014 and 2015-2019 from 9.5 to 9.4 deaths per 100,000 persons years. This difference was not statistically significant.
- Among females age-standardised mortality rates from brain cancer did not change between 2010-2014 and 2015-2019 with 5.2 deaths per 100,000 persons years in both five-year periods.



Mortality data are provided by the Northern Ireland General Registrar Office via the Department of Health.

Counts of the number of deaths are based upon the year that death occurred, and upon the primary cause of death only.

Age-standardised mortality rates remove changes over time caused by population growth and/or ageing.

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. colorectal cancer 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.