Brain cancer

(Including other central nervous system)

Patients diagnosed 1993-2020
(ICD10: C70-C72, C75.1-C75.3)

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

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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 2016-2020:

▪ There were 92 male and 61 female cases of brain cancer diagnosed each year.

▪ The risk of developing brain cancer before the age of 75 was 1 in 158 for men and 1 in 241 for women, while before the age of 85 the risk was 1 in 93 for men and 1 in 168 for women.

Incidence by age at diagnosis - *Brain cancer, Cases in 2016-2020*

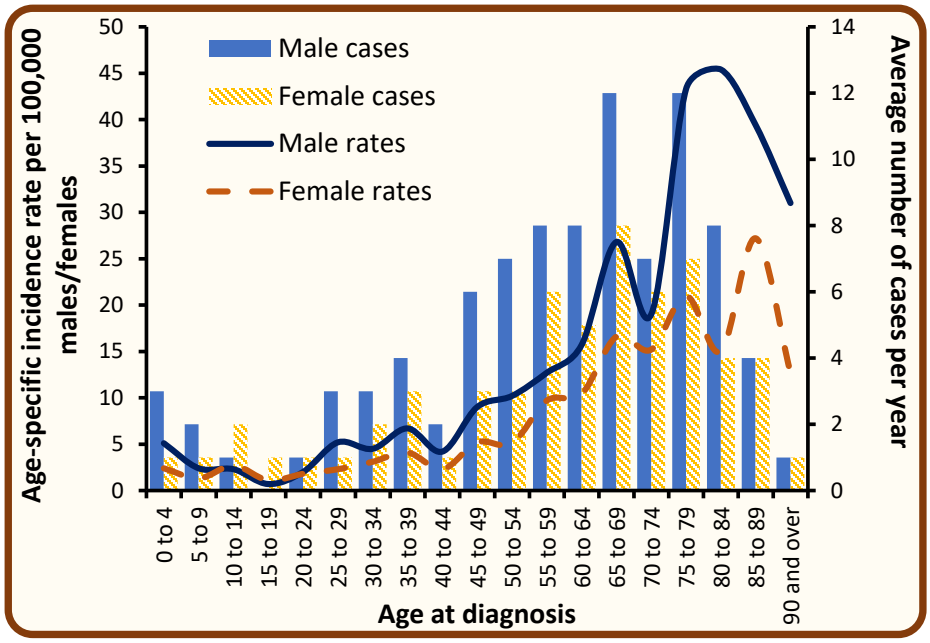
During 2016-2020:

▪ The median age at diagnosis was 63 for men and 64 for women.

▪ Cancer risk varied by age, with 27.2% of men and 26.2% of women aged 75 years or more at diagnosis.

▪ 34.9% of cases were diagnosed among those aged under 55.

Age at diagnosis	Average cases per year		
	Male	Female	Both sexes
0 - 54	32	19	53
54 - 64	16	11	27
65 - 74	19	14	33
75 +	25	16	41
All ages	92	61	152

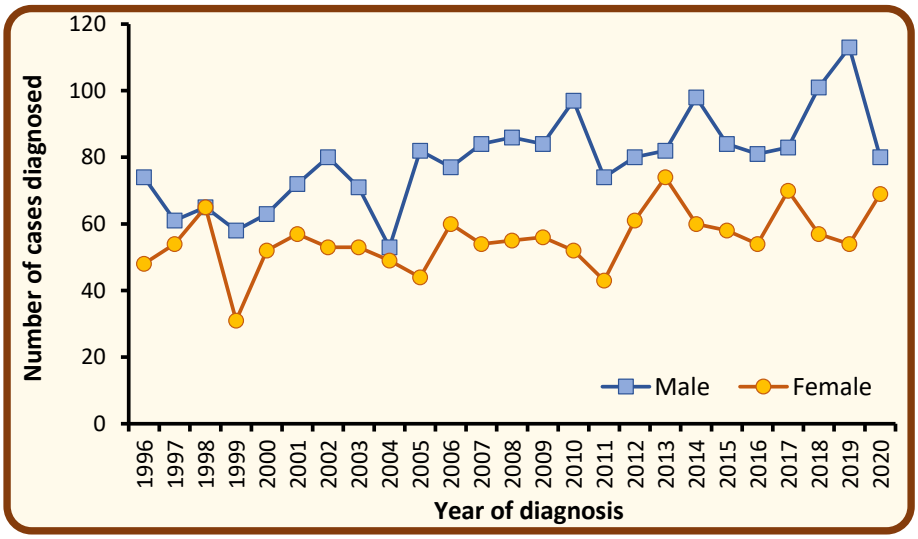


Incidence by year of diagnosis - *Brain cancer, Cases in 1996-2020*

▪ Among males the number of cases of brain cancer increased by 9.5% from an annual average of 84 cases in 2011-2015 to 92 cases in 2016-2020.

▪ Among females the number of cases of brain cancer increased by 3.4% from an annual average of 59 cases in 2011-2015 to 61 cases in 2016-2020.

Year of diagnosis	Male	Female	Both sexes
2011	74	43	117
2012	80	61	141
2013	82	74	156
2014	98	60	158
2015	84	58	142
2016	81	54	135
2017	83	70	153
2018	101	57	158
2019	113	54	167
2020	80	69	149

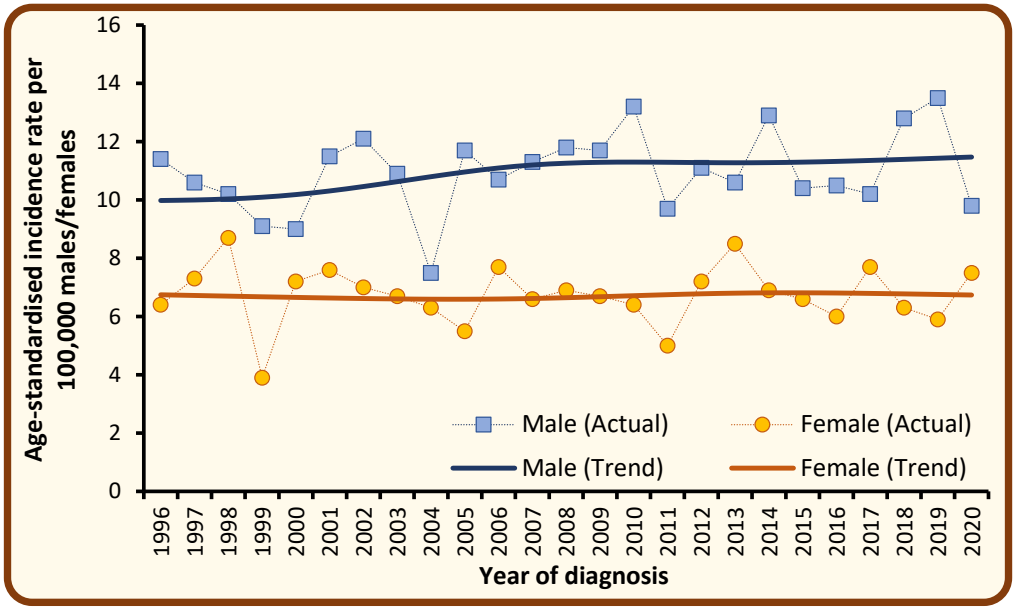


Note: Annual averages have been rounded to the nearest integer. Sums of numbers in table rows or columns may thus differ slightly from the given total.
NMSC: Non-melanoma skin cancer

Trends in age-standardised incidence rates - *Brain cancer, Cases in 1996-2020*

▪ Among males age-standardised incidence rates of brain cancer increased by 3.6% from 11.0 per 100,000 person years in 2011-2015 to 11.4 cases per 100,000 persons years in 2016-2020. This difference was not statistically significant.

▪ Among females age-standardised incidence rates of brain cancer decreased by 2.9% from 6.9 per 100,000 person years in 2011-2015 to 6.7 cases per 100,000 persons years in 2016-2020. 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 2016-2020*

The annual number of cases during 2016-2020 varied in each deprivation quintile due to variations in population size and age.

After accounting for these factors, incidence rates:

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

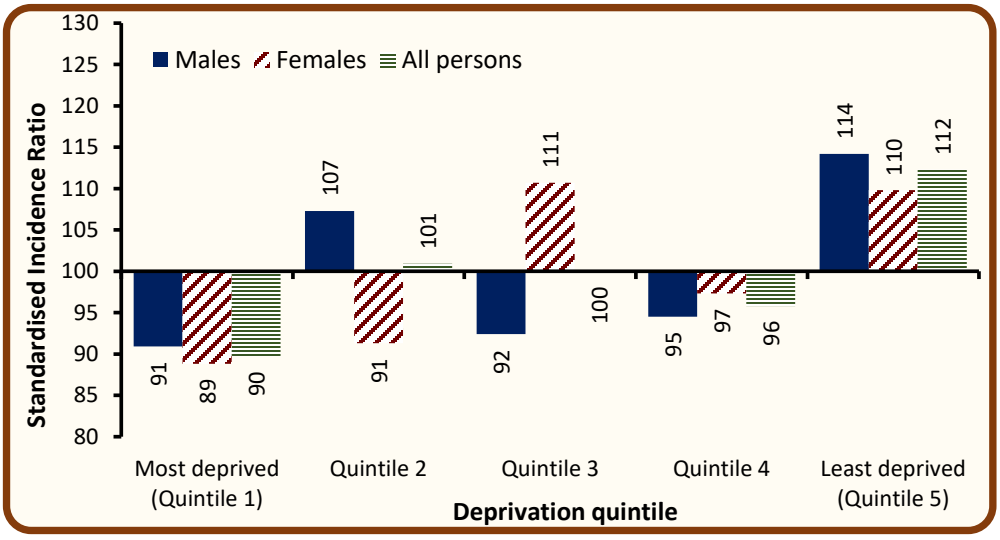
▪ in the most socio-economically deprived areas did not vary significantly from the NI average.

Deprivation quintile	Average cases per year		
	Male	Female	Both sexes
Most deprived (Quintile 1)	14	9	24
Quintile 2	20	11	31
Quintile 3	18	14	32
Quintile 4	18	12	31
Least deprived (Quintile 5)	21	14	35
Northern Ireland	92	61	152

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.



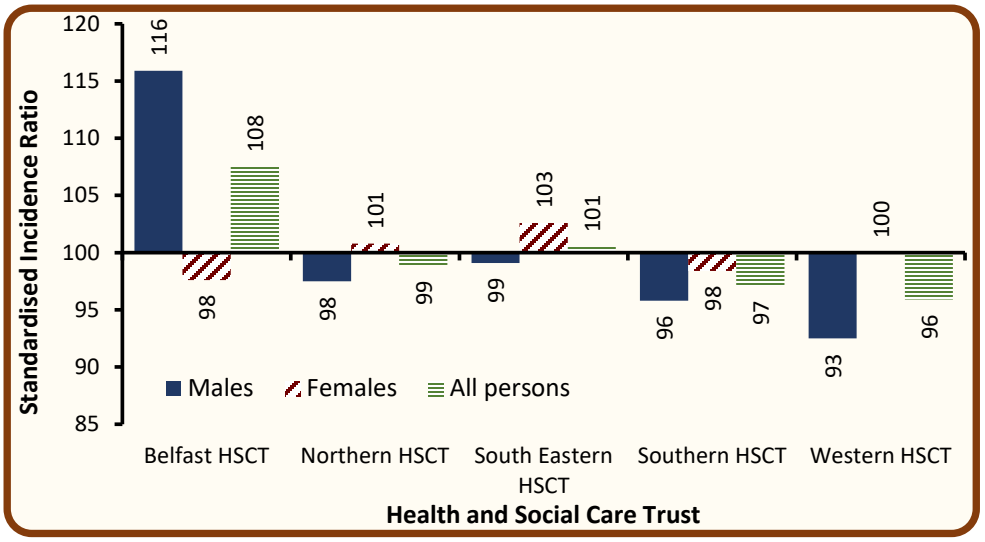
Incidence by Health and Social Care Trust (HSCT) - *Brain cancer, Cases in 2016-2020*

The annual number of cases during 2016-2020 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	19	11	30
Northern HSCT	23	16	39
South Eastern HSCT	18	13	31
Southern HSCT	17	11	29
Western HSCT	14	9	23
Northern Ireland	92	61	152



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.

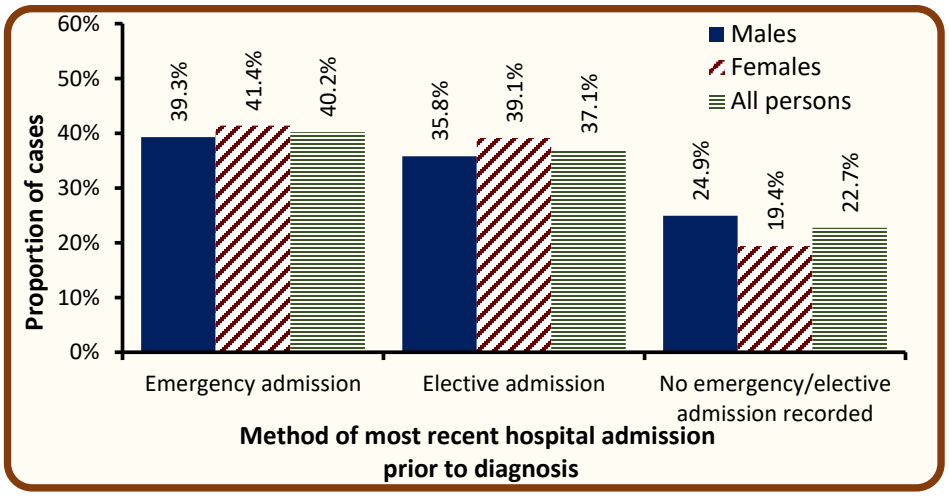
Data for Local Government Districts and Parliamentary Constituencies are available at www.qub.ac.uk/research-centres/nicr

Incidence by method of most recent admission to hospital - *Brain cancer, Cases in 2016-2020*

During 2016-2020:

- 40.2% 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 41.4% of female cases.
- In 22.7% 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	25	61
Elective admission	33	24	57
No emergency/elective admission recorded	23	12	35
Total	92	61	152



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

▪ 40.9% of patients were alive one year and 19.7% were alive five years from a brain cancer diagnosis in 2011-2015. (observed survival)

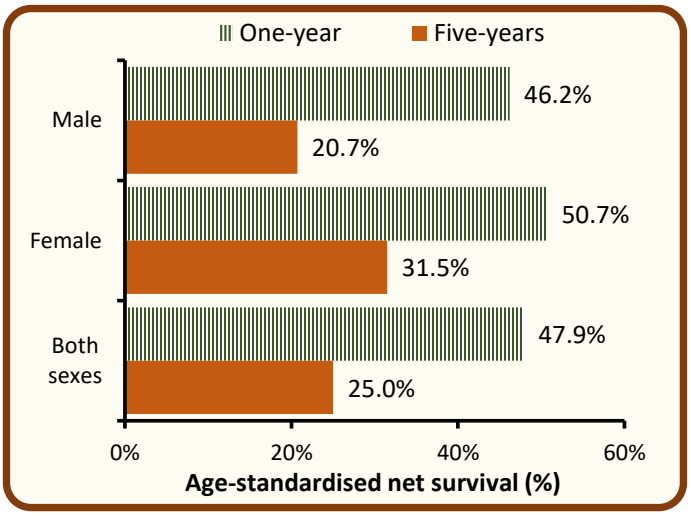
▪ Age-standardised net survival (ASNS), which removes the effect of deaths from causes unrelated to cancer, was 47.9% one year and 25.0% five years from a brain cancer diagnosis in 2011-2015.

▪ Five-year survival (ASNS) for brain cancer patients diagnosed in 2011-2015 was 20.7% among men and 31.5% among women.

Gender	Observed survival		Age-standardised net survival	
	One-year	Five-years	One-year	Five-years
Male	40.6%	16.7%	46.2%	20.7%
Female	41.3%	24.0%	50.7%	31.5%
Both sexes	40.9%	19.7%	47.9%	25.0%

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.

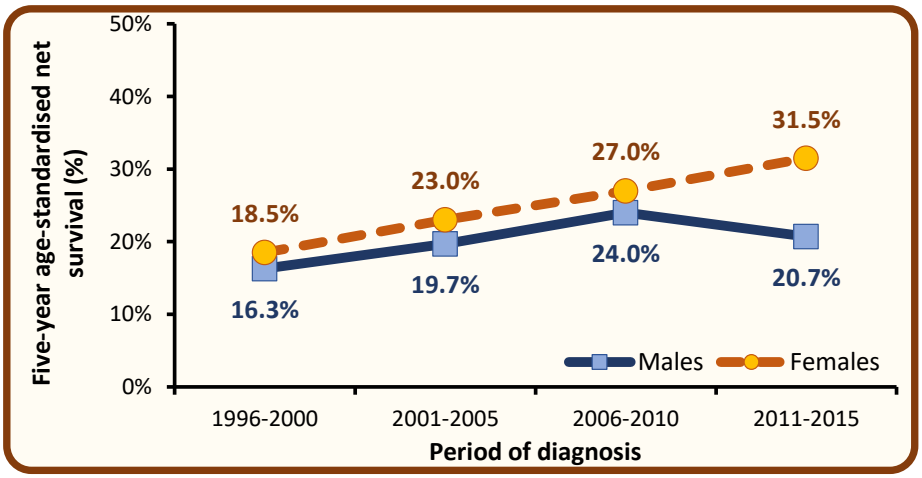
Age-standardised net survival is the proportion of patients who would survive if the patient could not die from causes unrelated to their cancer. This measure is more typically used in studies of cancer survival.



Trends in survival - *Brain cancer, Patients diagnosed in 1996-2015*

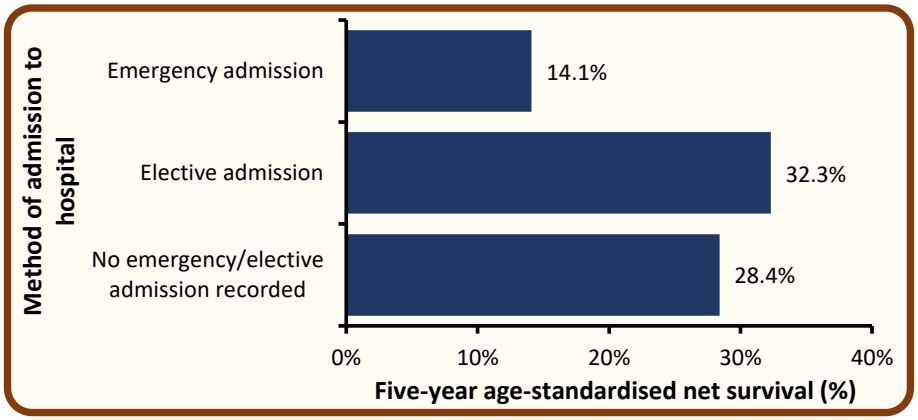
▪ Among men five-year survival (ASNS) from brain cancer decreased from 24.0% in 2006-2010 to 20.7% in 2011-2015. This difference was not statistically significant.

▪ Among women five-year survival (ASNS) from brain cancer increased from 27.0% in 2006-2010 to 31.5% in 2011-2015. This difference was not statistically significant.



Survival by method of most recent admission to hospital - *Brain cancer, Patients diagnosed in 2011-2015*

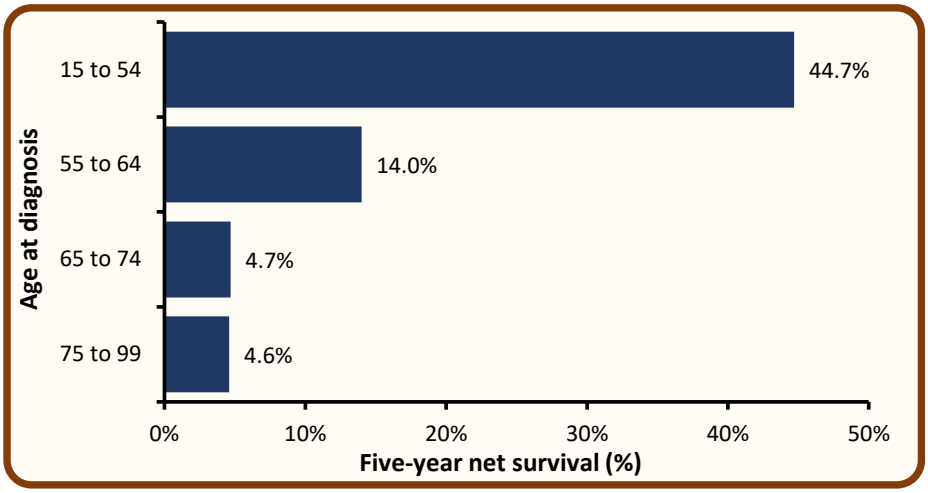
▪ Five-year survival (ASNS) among brain cancer patients who had an emergency admission to hospital up to 30 days prior to their cancer diagnosis was 14.1% compared to 32.3% among those with elective admissions and 28.4% among those who had no hospital admissions recorded up to 30 days prior to diagnosis.



Survival by age at diagnosis - *Brain cancer, Patients diagnosed in 2011-2015*

▪ Survival from brain cancer among patients diagnosed in 2011-2015 was strongly related to age with better five-year survival among younger age groups. In particular:

▪ Five-year net survival was 44.7% among patients aged 15 to 54 at diagnosis, compared to to 4.6% among those aged 75 and over.



Prevalence

▪ At the end of 2020, there were 669 people (Males: 371; Females: 298) living with brain cancer who had been diagnosed with the disease during 1996-2020.

▪ Of these, 55.5% were male, 29.4% were aged 55 and over, and 14.1% had been diagnosed in the previous year.

25-year prevalence refers to the number of cancer survivors who were alive at the end of 2020, and had been diagnosed with their cancer in the previous 25 years (i.e. 1996-2020).

Time since diagnosis	25-year prevalence								
	Aged 0-54			Aged 55+			All ages		
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
0-1 year	26	12	38	23	33	56	49	45	94
1-5 years	75	47	122	23	22	45	98	69	167
5-10 years	59	50	109	17	21	38	76	71	147
10-25 years	116	87	203	32	26	58	148	113	261
0-25 years	276	196	472	95	102	197	371	298	669

Trends in 10-year prevalence - *Brain cancer, Patients alive at end of each year from 2011-2020*

▪ Among males the number of survivors from brain cancer who had been diagnosed within the previous ten years decreased by 3.5% from 231 survivors in 2015 to 223 survivors in 2020.

▪ Among females the number of survivors from brain cancer who had been diagnosed within the previous ten years increased by 6.3% from 174 survivors in 2015 to 185 survivors in 2020.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Male	221	218	219	238	231	230	222	220	238	223
Female	150	153	162	166	174	167	172	166	173	185
Both sexes	371	371	381	404	405	397	394	386	411	408

Mortality

- During 2016-2020 there were 73 male and 49 female deaths from brain cancer each year.
- Brain cancer made up 3.1% of all male, and 2.3% of all female cancer deaths (ex NMSC).

Deaths by age at death *- Brain cancer, Deaths in 2016-2020*

- The median age at death during 2016-2020 was 67 for men and 68 for women.
- Risk of death from brain cancer was strongly related to patient age, with 31.5% of men and 30.6% of women aged 75 years or more at time of death.
- 22.1% of brain cancer deaths occurred among those aged under 55.

Age at death	Average deaths per year		
	Male	Female	Both sexes
0 - 54	17	9	27
55 - 64	14	10	25
65 - 74	17	14	31
75 +	23	15	40
All ages	73	49	122

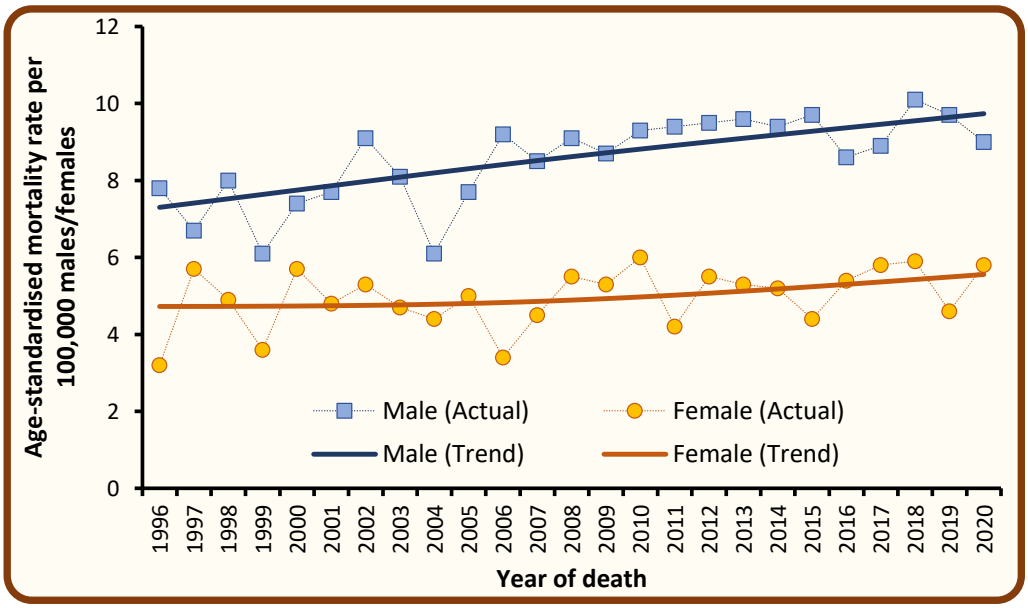
Deaths by year of death *- Brain cancer, Deaths in 2011-2020*

- Among males the number of deaths from brain cancer increased by 4.3% from an annual average of 70 deaths in 2011-2015 to 73 deaths in 2016-2020.
- Among females the number of deaths from brain cancer increased by 19.5% from an annual average of 41 deaths in 2011-2015 to 49 deaths in 2016-2020.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Male	67	69	70	70	74	67	69	78	76	74
Female	34	46	44	45	37	47	52	52	42	53
Both sexes	101	115	114	115	111	114	121	130	118	127

Trends in age-standardised mortality rates *- Brain cancer, Deaths in 1996-2020*

- Among males age-standardised mortality rates from brain cancer decreased by 2.1% between 2011-2015 and 2016-2020 from 9.5 to 9.3 deaths per 100,000 persons years. This difference was not statistically significant.
- Among females age-standardised mortality rates from brain cancer increased by 12.2% between 2011-2015 and 2016-2020 from 4.9 to 5.5 deaths per 100,000 persons years. This difference was not statistically significant.



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 2020 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.