Brain cancer

1993-2022

(Including central nervous system)

(ICD10 codes: C70-C72, C75.1-C75.3)

Northern Ireland Cancer Registry

Northern Ireland Cancer Registry, 2025

An official statistics publication

ABOUT THIS REPORT

Contents

This report includes information on incidence of brain cancer (including central nervous system) as recorded by the Northern Ireland Cancer Registry (NICR). Incidence data is available annually from 1993 to 2022, however in order to provide stable and robust figures the majority of information presented in this report is based upon the average number of cases diagnosed in the last five years.

Methodology

The methodology used in producing the statistics presented in this report, including details of data sources, classifications and coding are available in the accompanying methodology report available at: www.qub.ac.uk/research-centres/nicr/CancerInformation/official-statistics.

Official statistics

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. Further information on this code is available at code.statisticsauthority.gov.uk.

Cancer mortality data

The NI Statistics and Research Agency (NISRA) is the official statistics provider of cancer mortality data in Northern Ireland. However, for completeness, data on cancer mortality is also provided in this report. While analysis is conducted by NICR staff, the original data is provided courtesy of the General Register Office (NI) via the Department of Health.

Reuse of information

The information in this report (and any supplementary material) is available for reuse free of charge and without the need to contact NICR. However, we request that NICR is acknowledged as the source of any reused information. The following reference is recommended:
Northern Ireland Cancer Registry 2025. Brain cancer: 1993-2022. Available at: www.qub.ac.uk/research-centres/nicr

Further information

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

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Acknowledgements

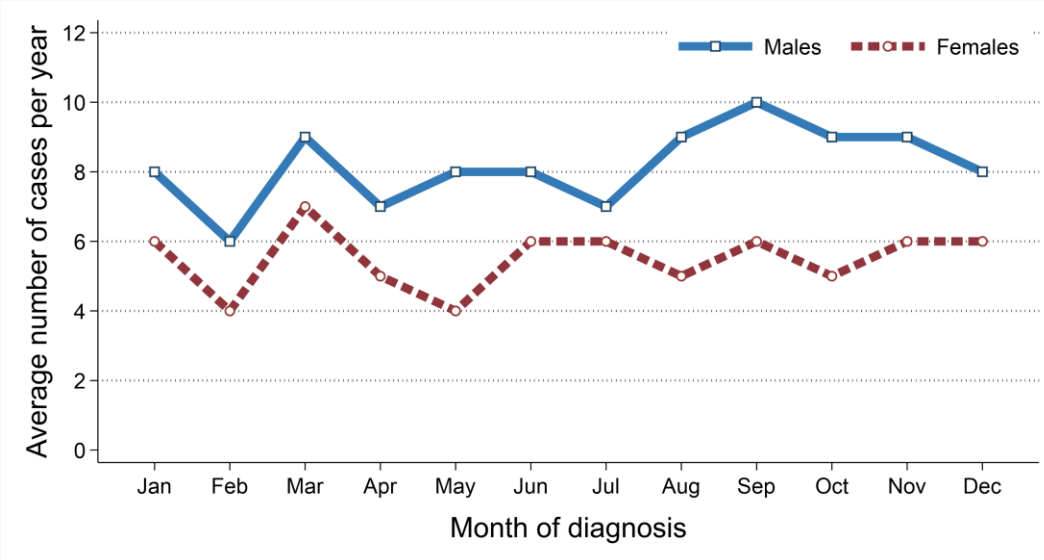
The Northern Ireland Cancer Registry (NICR) uses data provided by patients and collected by the health service as part of their care and support.

NICR is funded by the Public Health Agency and is based in Queen's University, Belfast.

INCIDENCE

- There were 811 cases of brain cancer (including central nervous system) diagnosed during 2018-2022 in Northern Ireland. On average this was 162 cases per year.
- During this period 39.7% of brain cancer cases were among women (Male cases: 489, Female cases: 322). On average there were 98 male and 64 female cases of brain cancer per year.
- The most common diagnosis month during 2018-2022 was September among males with 10 cases per year and March among females with 7 cases per year.

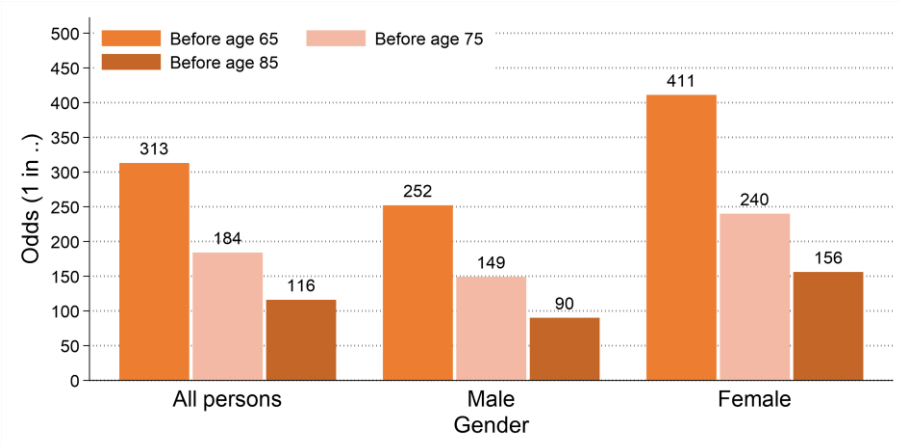
Figure 1: Average number of cases of brain cancer per year in 2018-2022 by month of diagnosis



Month of diagnosis	Average number of cases per year	
	Males	Females
January	8	6
February	6	4
March	9	7
April	7	5
May	8	4
June	8	6
July	7	6
August	9	5
September	10	6
October	9	5
November	9	6
December	8	6

- Brain cancer made up 1.9% of all male and 1.3% of all female cancer cases (excluding non-melanoma skin cancer).
- The brain cancer incidence rates for each gender were 10.5 cases per 100,000 males and 6.7 cases per 100,000 females.
- The odds of developing brain cancer before age 85 was 1 in 90 for men and 1 in 156 for women.

Figure 2: Odds of developing brain cancer in 2018-2022



INCIDENCE BY AGE

- The median age of patients diagnosed with brain cancer during 2018-2022 was 65 years (Males: 65, Females: 66).
- The risk of developing brain cancer varied by age, with 27.0% of men and 29.5% of women diagnosed with brain cancer aged 75 and over at diagnosis.
- In contrast, 30.0% of patients diagnosed with brain cancer were aged 0 to 54 at diagnosis.

Figure 3: Average number of cases of brain cancer diagnosed per year in 2018-2022 by age at diagnosis

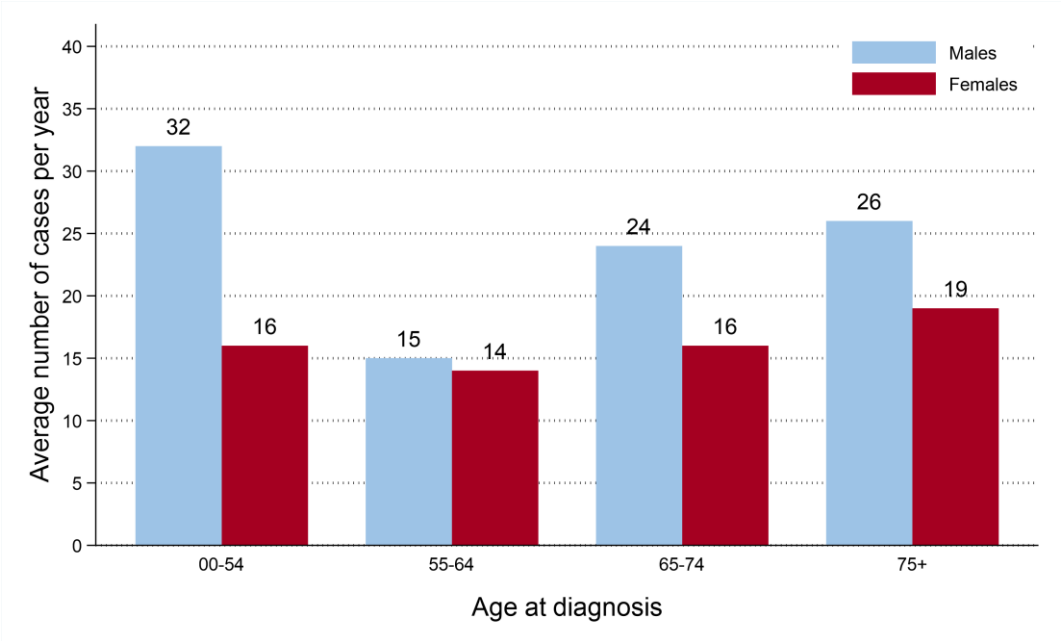
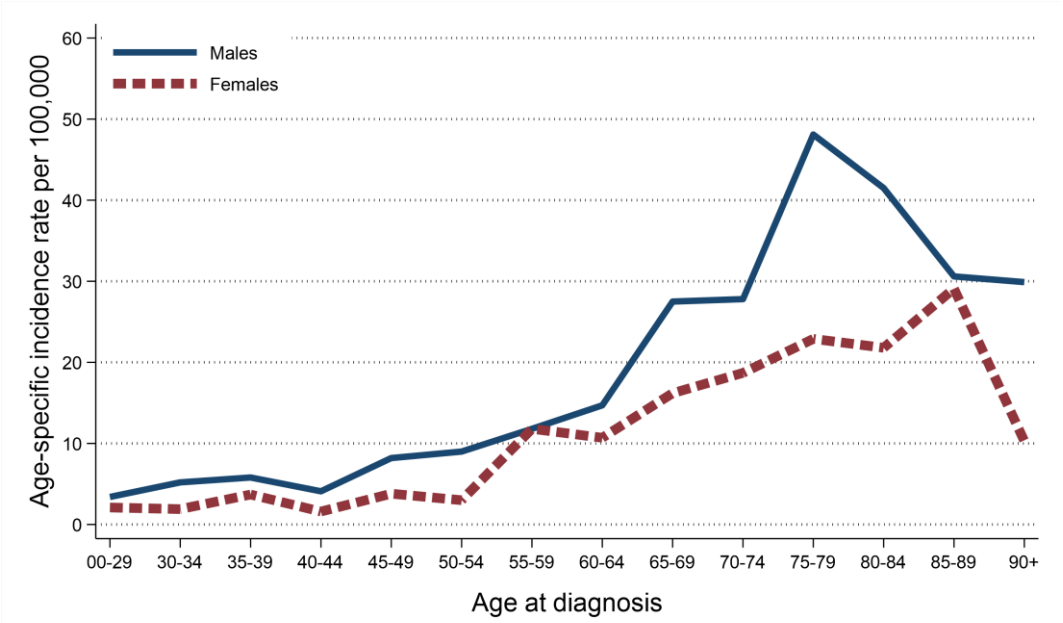


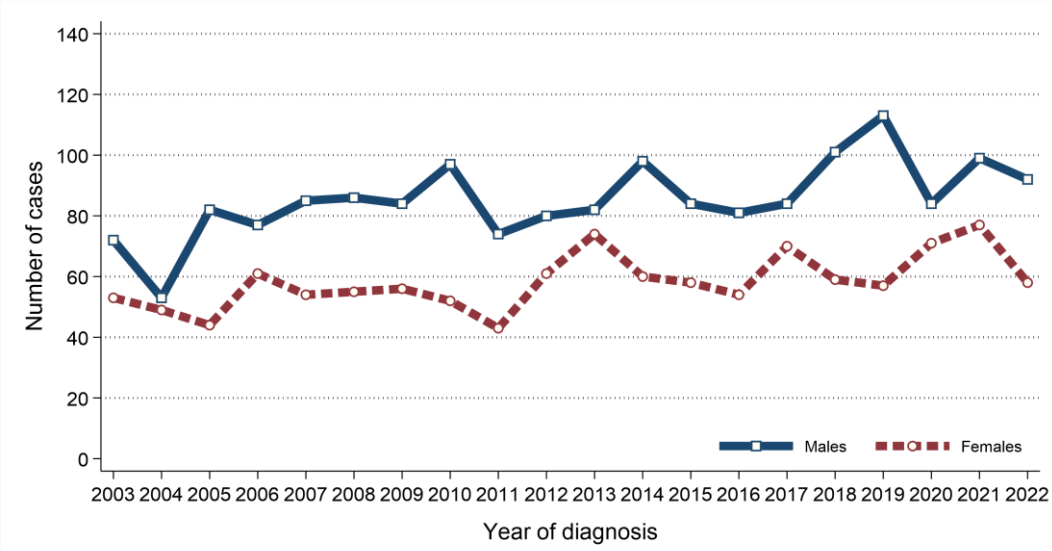
Figure 4: Age-specific incidence rates of brain cancer in 2018-2022



INCIDENCE TRENDS

- The number of cases of brain cancer among males increased between 2013-2017 and 2018-2022 by 14.0% from 429 cases (86 cases per year) to 489 cases (98 cases per year).
- The number of cases of brain cancer among females increased between 2013-2017 and 2018-2022 by 1.9% from 316 cases (63 cases per year) to 322 cases (64 cases per year).

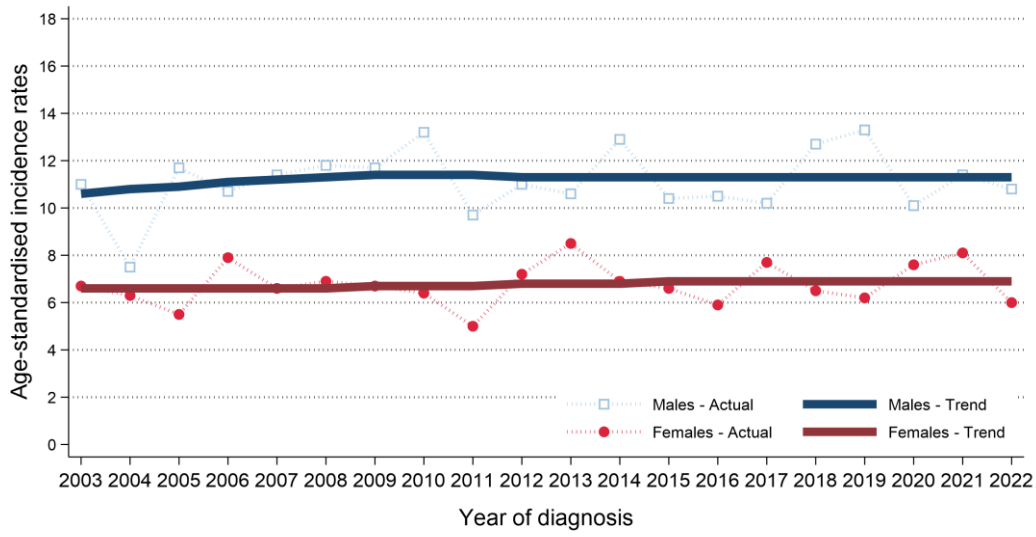
Figure 5: Trends in number of cases of brain cancer diagnosed from 2003 to 2022



Year of diagnosis	Number of cases	
	Males	Females
2013	82	74
2014	98	60
2015	84	58
2016	81	54
2017	84	70
2018	101	59
2019	113	57
2020	84	71
2021	99	77
2022	92	58

- Male age-standardised brain cancer incidence rates increased between 2013-2017 and 2018-2022 by 7.3% from 10.9 to 11.7 cases per 100,000 males. This change was not statistically significant.
- Female age-standardised brain cancer incidence rates decreased between 2013-2017 and 2018-2022 by 2.8% from 7.1 to 6.9 cases per 100,000 females. This change was not statistically significant.

Figure 6: Trends in incidence rates of brain cancer from 2003 to 2022



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).

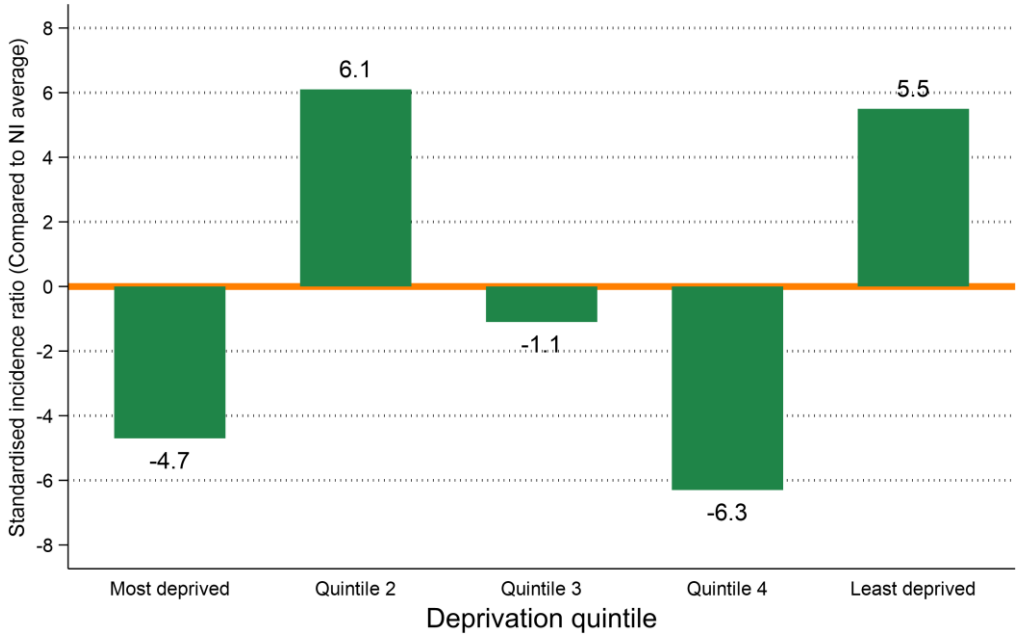
INCIDENCE BY DEPRIVATION

- The number of cases of brain cancer diagnosed during 2018-2022 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.

Table 1: Number of cases of brain cancer diagnosed in 2018-2022 by deprivation quintile

Deprivation quintile	All persons		Male		Female	
	Total cases in period	Average cases per year	Total cases in period	Average cases per year	Total cases in period	Average cases per year
Northern Ireland	**811**	**162**	**489**	**98**	**322**	**64**
	.	.	.	.	.	.
Most deprived	132	26	88	18	44	9
Quintile 2	173	35	103	21	70	14
Quintile 3	169	34	103	21	66	13
Quintile 4	161	32	91	18	70	14
Least deprived	176	35	104	21	72	14
Unknown	0	0	0	0	0	0

Figure 7: Standardised incidence ratio comparing deprivation quintile to Northern Ireland for brain cancer diagnosed in 2018-2022



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

A value above 0 means that incidence rates in that deprivation quintile 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.

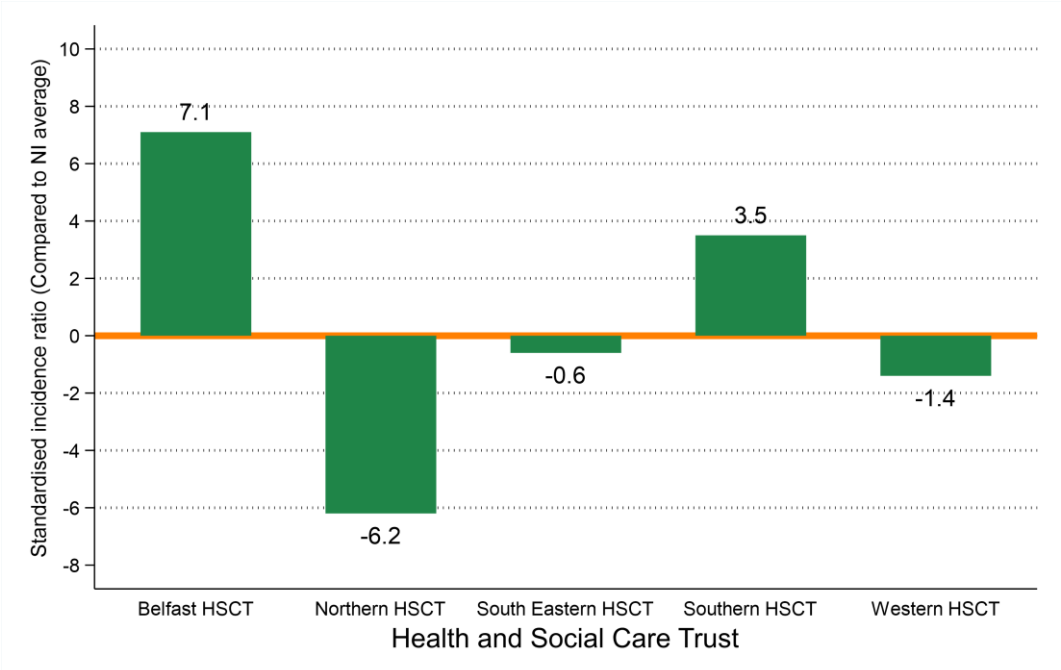
INCIDENCE BY HEALTH AND SOCIAL CARE TRUST

- The number of cases of brain cancer diagnosed during 2018-2022 varied in each Health and Social Care Trust 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.

Table 2: Number of cases of brain cancer diagnosed in 2018-2022 by Health and Social Care Trust

Health and Social Care Trust	All persons		Male		Female	
	Total cases in period	Average cases per year	Total cases in period	Average cases per year	Total cases in period	Average cases per year
Northern Ireland	**811**	**162**	**489**	**98**	**322**	**64**
	.	.	.	.	.	.
Belfast HSCT	157	31	102	20	55	11
Northern HSCT	199	40	115	23	84	17
South Eastern HSCT	166	33	98	20	68	14
Southern HSCT	163	33	96	19	67	13
Western HSCT	126	25	78	16	48	10
Unknown	0	0	0	0	0	0

Figure 8: Standardised incidence ratio comparing Health and Social Care Trust to Northern Ireland for brain cancer diagnosed in 2018-2022



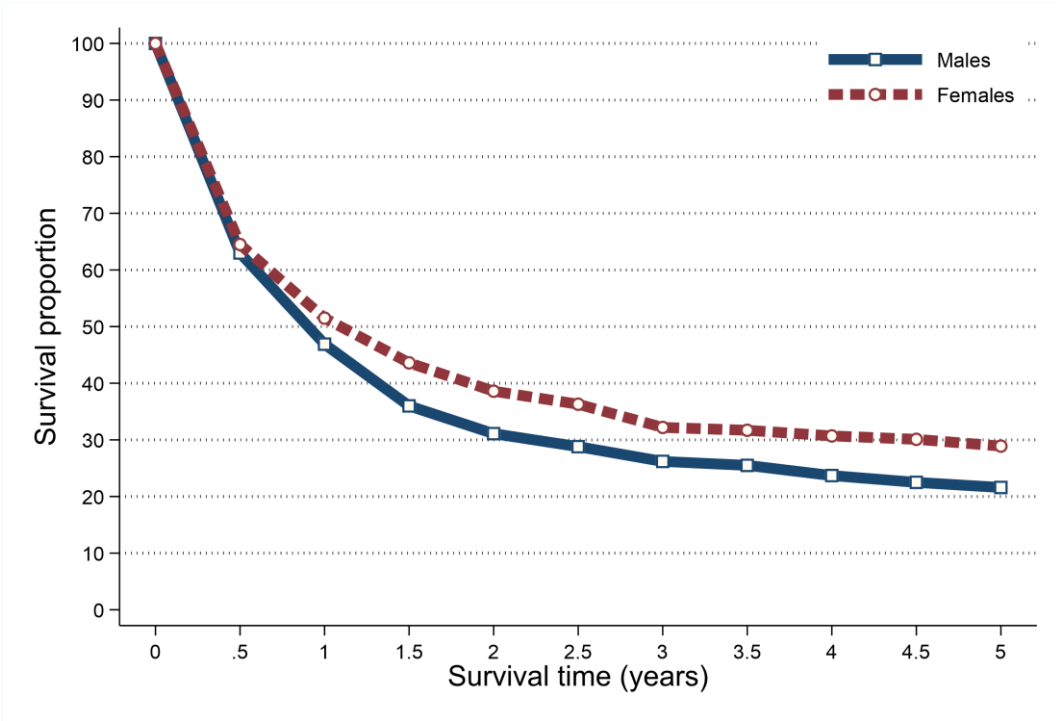
SURVIVAL

- 41.5% of patients were alive one year and 19.0% were alive five years from a brain cancer diagnosis in 2013-2017. (observed survival)
- Age-standardised net survival (ASNS), which removes the effect of deaths from causes unrelated to cancer, was 48.9% one year and 24.8% five years from a brain cancer diagnosis in 2013-2017.
- Five-year survival (ASNS) for brain cancer patients diagnosed in 2013-2017 was 21.6% among men and 28.9% among women.

Table 3: Survival from brain cancer for patients diagnosed in 2013-2017

Time since diagnosis	All persons		Male		Female	
	Observed survival	Age-standardised net survival	Observed survival	Age-standardised net survival	Observed survival	Age-standardised net survival
6 months	57.3%	63.6%	57.2%	63.0%	57.3%	64.5%
One year	41.5%	48.9%	40.1%	46.9%	43.4%	51.5%
Two years	27.8%	34.3%	25.3%	31.1%	31.2%	38.6%
Five years	19.0%	24.8%	16.6%	21.6%	22.3%	28.9%

Figure 9: Age-standardised net survival from brain cancer for patients diagnosed in 2013-2017



Observed survival examines the time between diagnosis and death from any cause, however, due to the inclusion of non-cancer deaths it may not fully reflect how changes in cancer care impact survival from cancer.

Age-standardised net survival provides an estimate of patient survival which has been adjusted to take account of deaths unrelated to cancer. It is more widely used to assess the impact of changes in cancer care on patient survival.

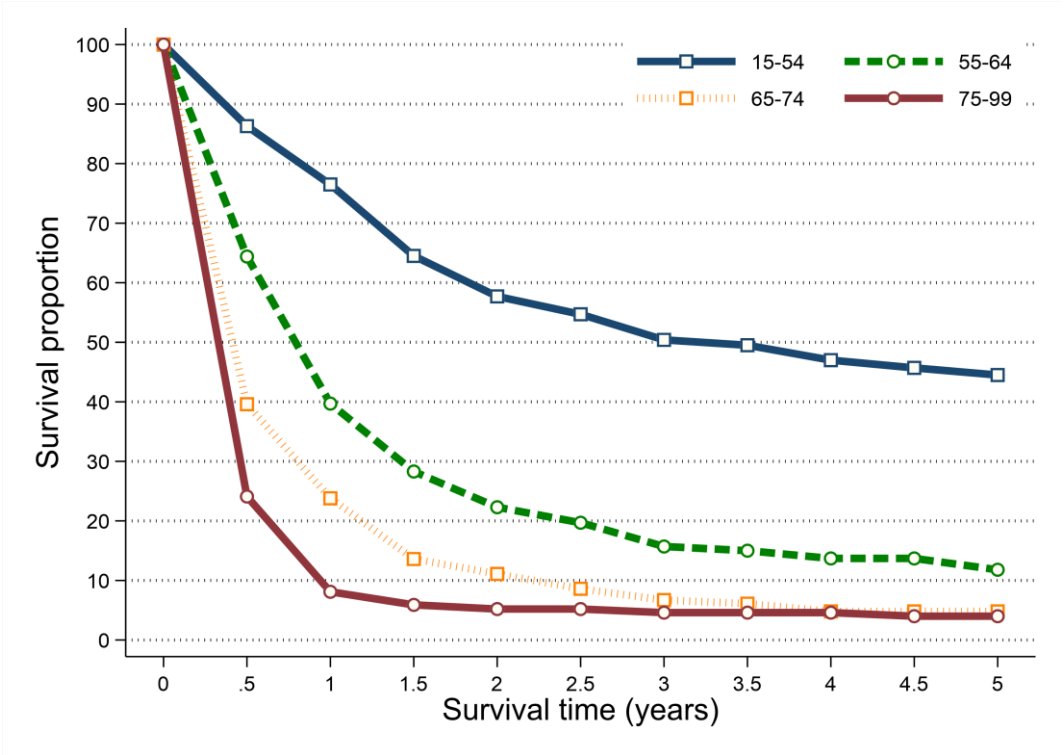
SURVIVAL BY AGE

- Survival from brain cancer among patients diagnosed during 2013-2017 was related to age with better five-year survival among younger age groups.
- Five-year net survival ranged from 44.5% among patients aged 15 to 54 at diagnosis to 4.0% among those aged 75 to 99.

Table 4: Net survival from brain cancer for patients diagnosed in 2013-2017 by age at diagnosis

Age group	All persons	
	One-year	Five-years
15 to 54	76.5%	44.5%
55 to 64	39.7%	11.8%
65 to 74	23.8%	4.8%
75 to 99	8.1%	4.0%

Figure 10: Net survival from brain cancer for patients diagnosed in 2013-2017 by age at diagnosis

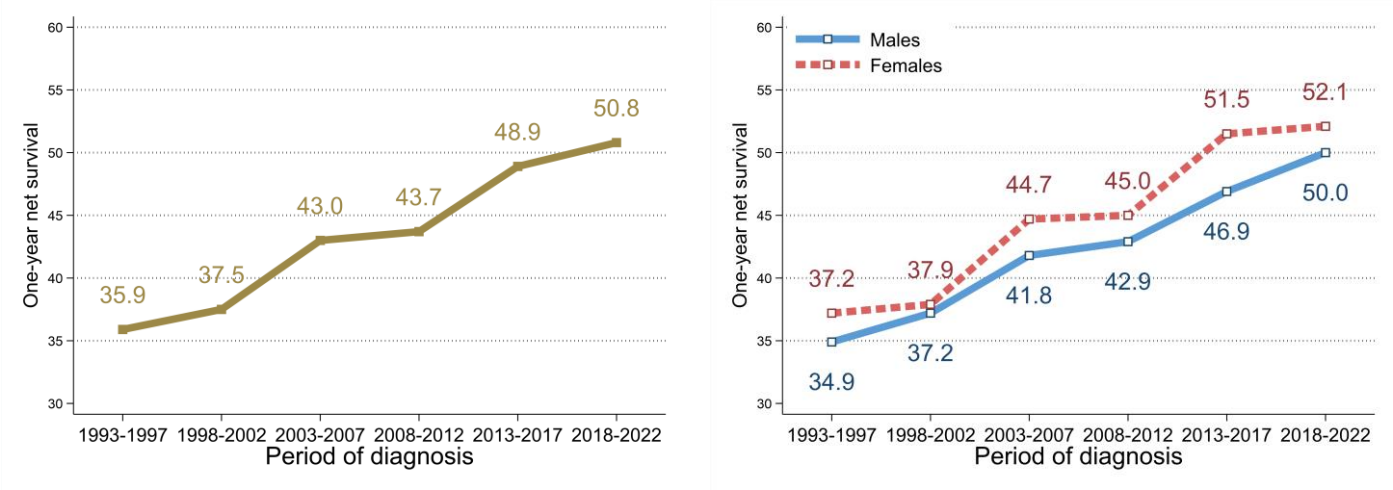


SURVIVAL TRENDS

ONE-YEAR NET SURVIVAL

- Between 2013-2017 and 2018-2022 there was no significant change in one-year survival (ASNS) from brain cancer.
- Compared to 1993-1997 one-year survival (ASNS) from brain cancer in 2018-2022 increased significantly from 35.9% to 50.8%. This change was not significant for either males or females when considered separately.

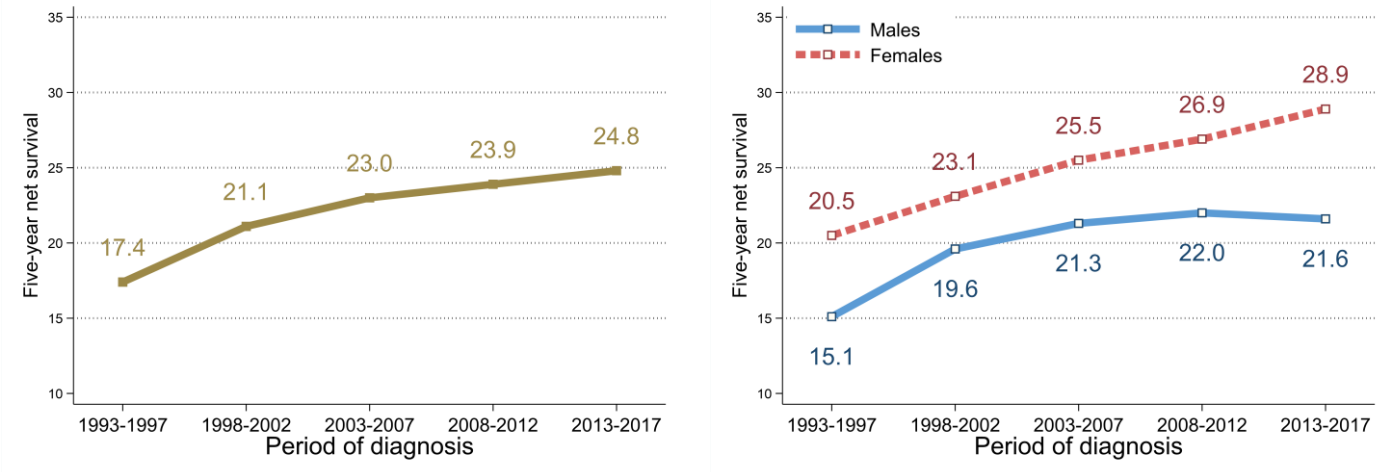
Figure 11: Trends in one-year age-standardised net survival from brain cancer in 1993-2022



FIVE-YEAR NET SURVIVAL

- Between 2008-2012 and 2013-2017 there was no significant change in five-year survival (ASNS) from brain cancer.
- Compared to 1993-1997 five-year survival (ASNS) from brain cancer in 2013-2017 did not change significantly.

Figure 12: Trends in five-year age-standardised net survival from brain cancer in 1993-2017



PREVALENCE

- At the end of 2022, there were 670 people (Males: 381; Females: 289) living with brain cancer who had been diagnosed with the disease during 1998-2022.
- Of these 12.1% had been diagnosed in the previous year (one-year prevalence) and 59.4% in the previous 10 years (ten-year prevalence).
- 4.5% of brain cancer survivors were aged 75 and over at the end of 2022.

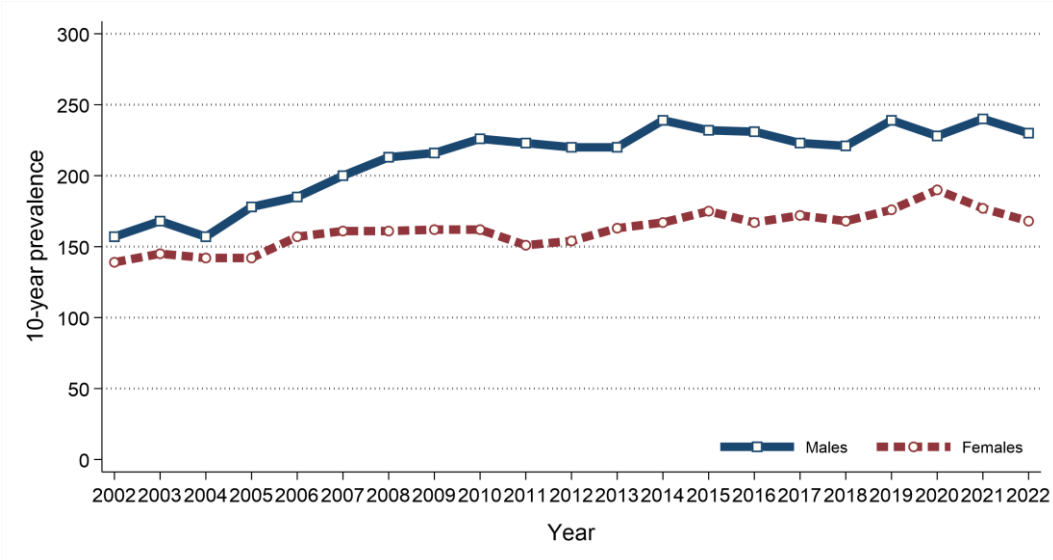
Table 5: 25-year prevalence of brain cancer by age at end of 2022

Gender	Age at end of 2022	25-year prevalence	Time since diagnosis			
			0 to 1 year	1 to 5 years	5 to 10 years	10 to 25 years
All persons	All ages	670	81	168	149	272
	0 to 74	640	72	163	144	261
	75 and over	30	9	5	5	11
Male	All ages	381	52	100	78	151
Female	All ages	289	29	68	71	121

PREVALENCE TRENDS

- 10-year prevalence of brain cancer among males increased between 2017 and 2022 by 3.1% from 223 survivors to 230 survivors.
- 10-year prevalence of brain cancer among females decreased between 2017 and 2022 by 2.3% from 172 survivors to 168 survivors.

Figure 13: Trends in 10-year prevalence of brain cancer in 2002-2022



Year	10-year prevalence	
	Males	Females
2013	220	163
2014	239	167
2015	232	175
2016	231	167
2017	223	172
2018	221	168
2019	239	176
2020	228	190
2021	240	177
2022	230	168

MORTALITY

- There were 656 deaths from brain cancer (including central nervous system) during 2018-2022 in Northern Ireland. On average this was 131 deaths per year.
- During this period 41.3% of brain cancer deaths were among women (Male deaths: 385, Female deaths: 271). On average there were 77 male and 54 female deaths from brain cancer per year.
- Brain cancer deaths made up 3.2% of all male and 2.5% of all female cancer deaths.
- The median age of patients who died from brain cancer during 2018-2022 was 69 years (Males: 68, Females: 70).
- The risk of dying from brain cancer varied by age, with 32.7% of men and 35.8% of women who died from brain cancer aged 75 and over at death.
- In contrast, 19.1% of patients who died from brain cancer were aged 0 to 54 at death.

Figure 14: Average number of deaths from brain cancer per year in 2018-2022 by age at death

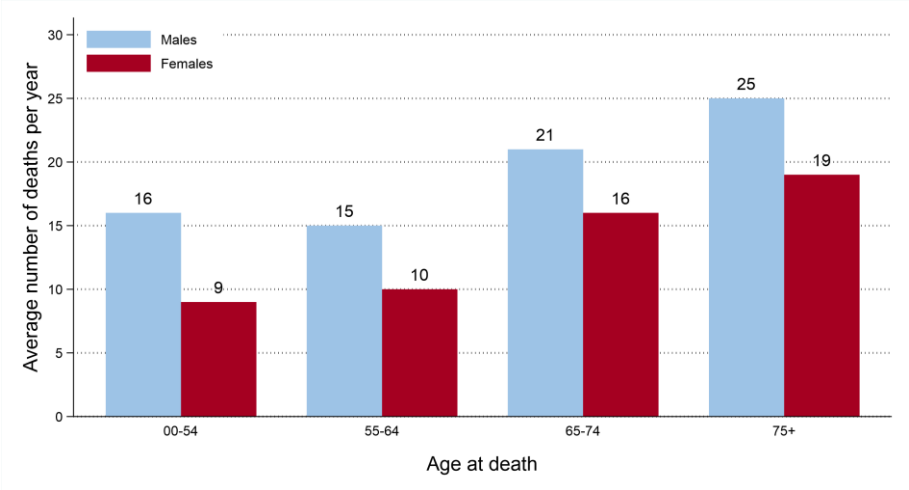
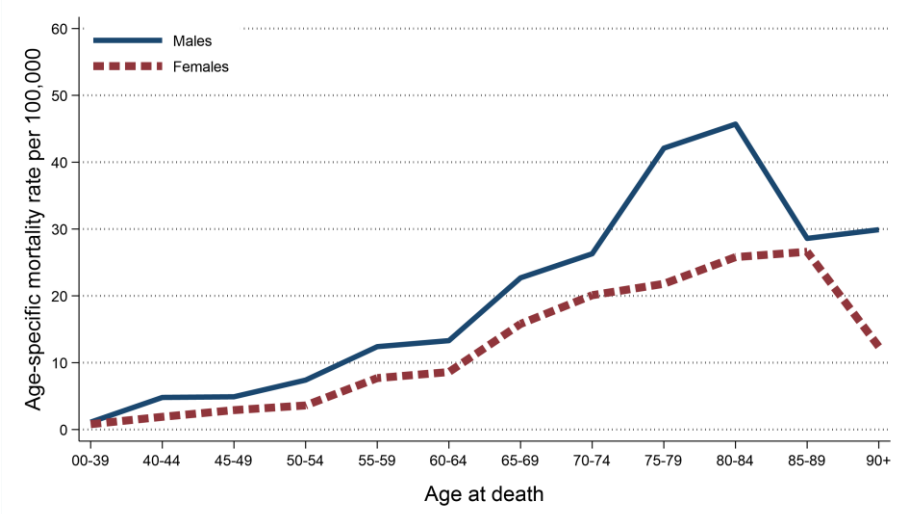


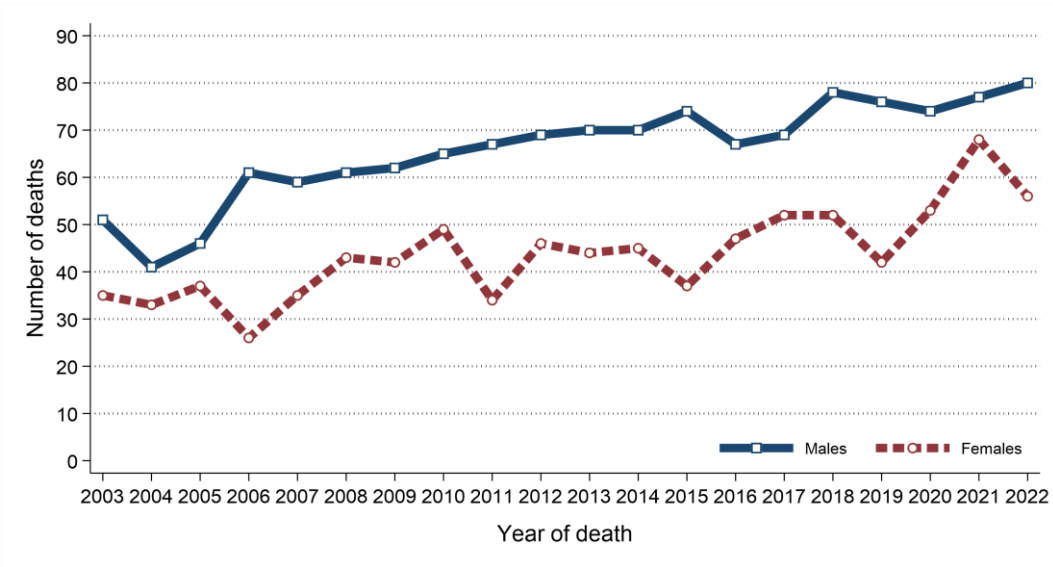
Figure 15: Age-specific mortality rates of brain cancer in 2018-2022



MORTALITY TRENDS

- The number of deaths from brain cancer among males increased between 2013-2017 and 2018-2022 by 10.0% from 350 deaths (70 deaths per year) to 385 deaths (77 deaths per year).
- The number of deaths from brain cancer among females increased between 2013-2017 and 2018-2022 by 20.4% from 225 deaths (45 deaths per year) to 271 deaths (54 deaths per year).

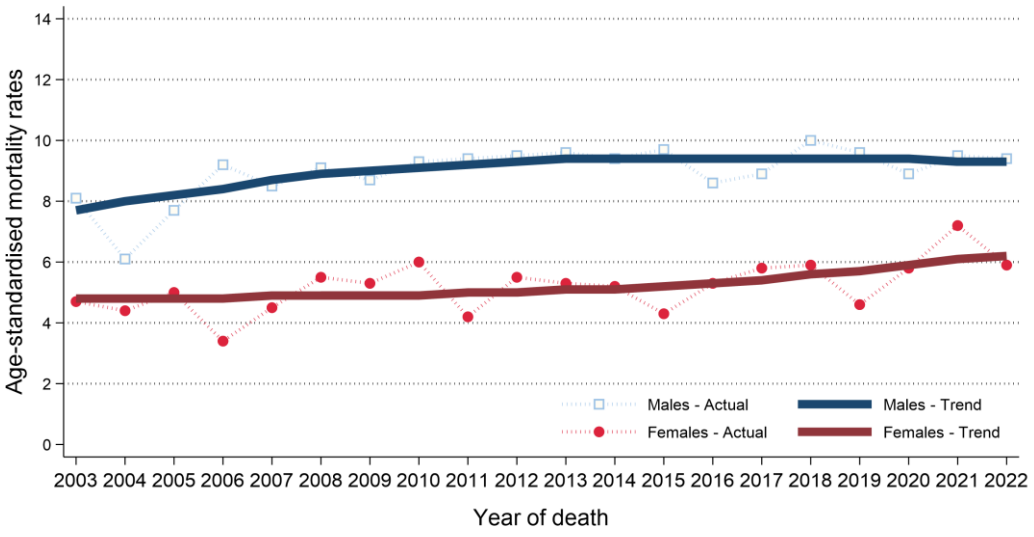
Figure 16: Trends in the number of deaths from brain cancer from 2003 to 2022



Year of death	Number of deaths	
	Males	Females
2013	70	44
2014	70	45
2015	74	37
2016	67	47
2017	69	52
2018	78	52
2019	76	42
2020	74	53
2021	77	68
2022	80	56

- Male age-standardised brain cancer mortality rates increased between 2013-2017 and 2018-2022 by 3.3% from 9.2 to 9.5 deaths per 100,000 males. This change was not statistically significant.
- Female age-standardised brain cancer mortality rates increased between 2013-2017 and 2018-2022 by 13.5% from 5.2 to 5.9 deaths per 100,000 females. This change was not statistically significant.

Figure 17: Trends in mortality rates of brain cancer from 2003 to 2022



Age-standardised mortality rates illustrate the change in the number of deaths 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.

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: 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: Geographic areas are assigned based on a patient's postcode of usual residence at diagnosis using the Jul 2024 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).

Crude incidence/mortality rate: 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.

Age-standardised incidence/mortality rates per 100,000 person years are estimates 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.

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 measure the precision of a statistic (e.g. brain 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. brain 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 2022 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.

Patient survival is evaluated using two measures. Observed survival examines the time between diagnosis and death from any cause. It thus represents what cancer patients experience, however, due to the inclusion of non-cancer deaths (e.g. heart disease), it may not reflect how changes in cancer care impact survival from cancer. Thus age-standardised net survival is also examined. This measure provides an estimate of patient survival which has been adjusted to take account of deaths unrelated to cancer. It also assumes a standard age distribution thereby removing the impact of changes in the age distribution of cancer patients on changes in survival over time. While this measure is hypothetical, as it assumes patients can only die from cancer related factors, it is a better indicator of the impact of changes in cancer care on patient survival.