Recent trends in incidence, survival and mortality of brain cancer in Northern Ireland

(A comparison between April-December of 2021, 2020 and 2018-2019)

Further information

Further information 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) 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

During the April-December period the number of cases of brain cancer diagnosed increased between 2018-2019 and 2021 by 10.7% from 122 cases per year to 135 cases.

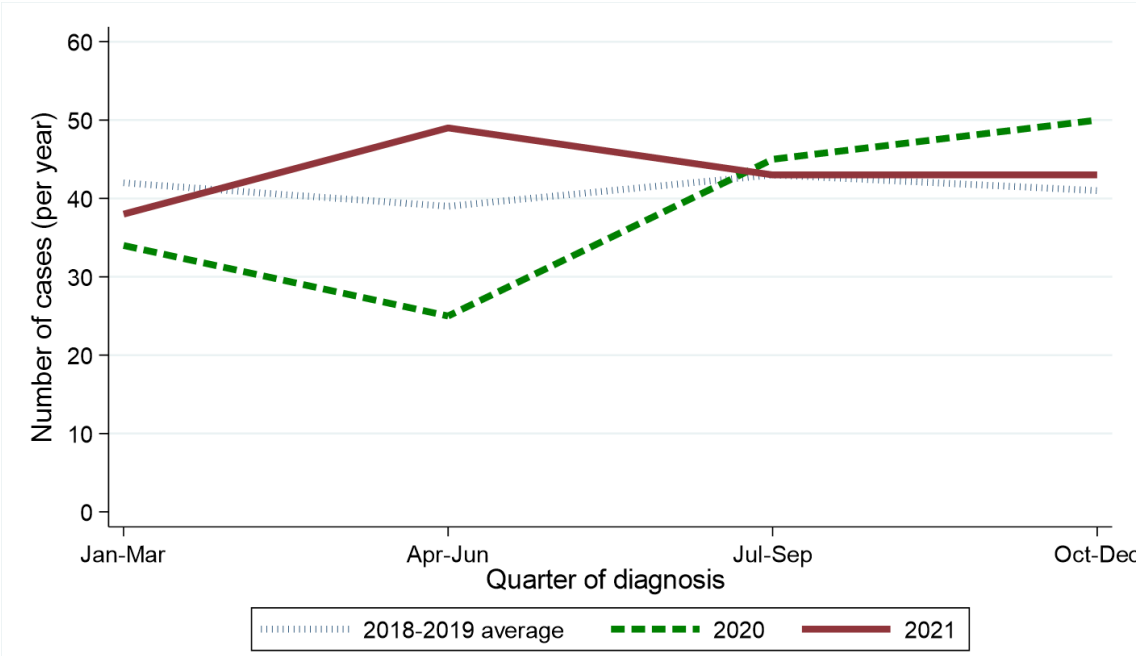
Table 1: Number of brain cancer cases diagnosed in 2018-2021 by quarter and year of diagnosis

Period of diagnosis	Annual total	Quarter diagnosed			
		Jan-Mar	Apr-Jun	Jul-Sept	Oct-Dec
2018-2019*	164	42	39	43	41
2020	154	34	25	45	50
2021	173	38	49	43	43

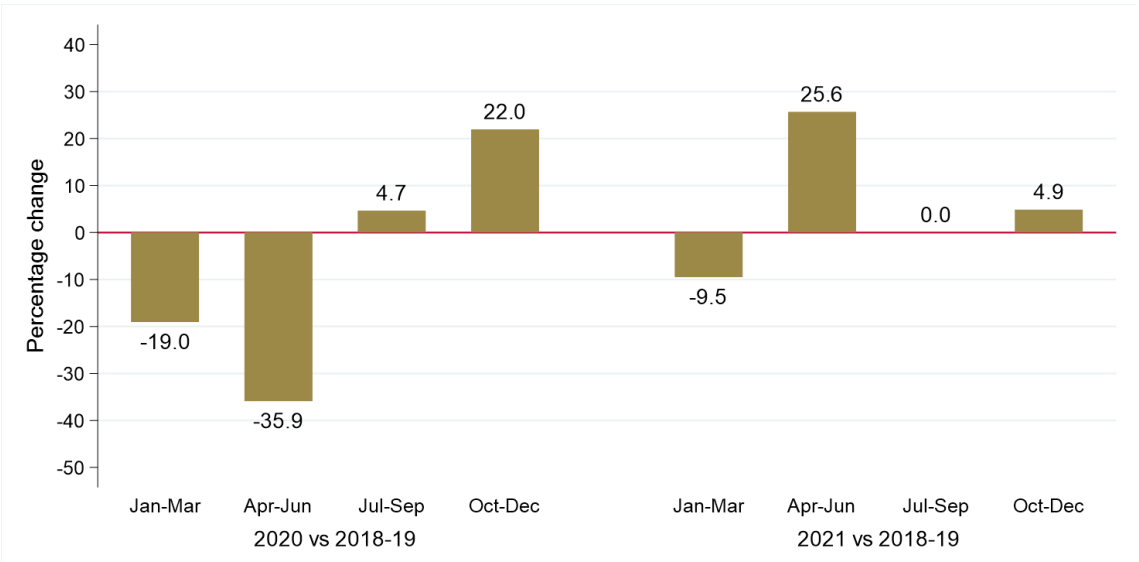
** Average cases per year rounded to the nearest integer. Row sums may thus differ slightly from the total.*

Figure 1: Number of brain cancer cases diagnosed in 2018-2021 by quarter and year of diagnosis

(a) Number of cases diagnosed by quarter of diagnosis



(b) Percentage change over time in number of cases by quarter of diagnosis



GENDER

Excluding the first quarter of each year the number of male brain cancer cases diagnosed decreased by 6.2% from 81 per year in 2018-2019 to 76 in 2021. Between the same two time periods the number of female brain cancer cases diagnosed increased by 43.9% from 41 per year in 2018-2019 to 59 in 2021. The change in case distribution by gender between 2018-2019 and 2021 was not statistically significant.

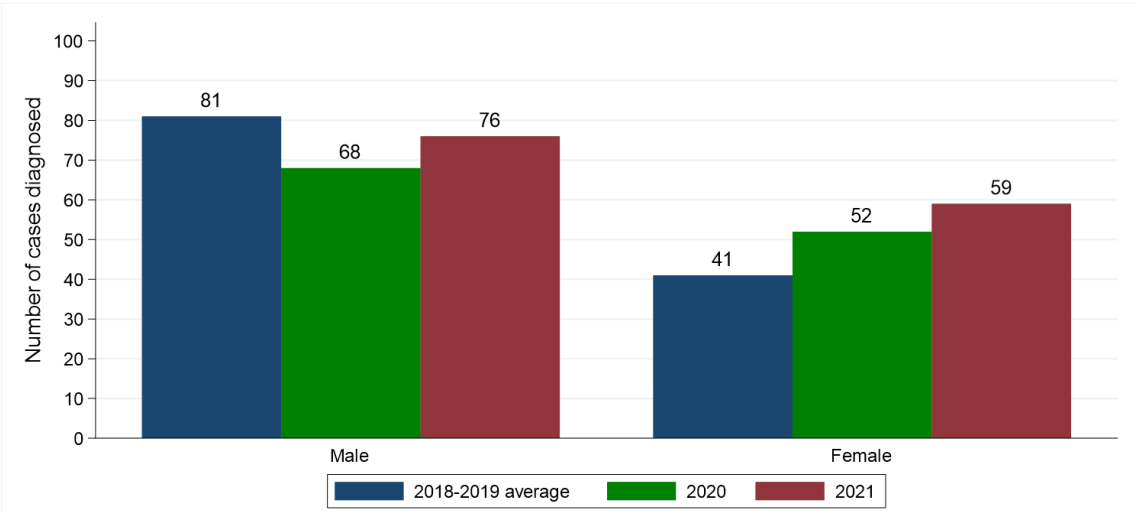
Table 2: Number and proportion of brain cancer cases diagnosed in April-December of 2018-2021 by gender and period of diagnosis

Gender	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All persons	122	120	135	-1.6%	+10.7%
Male	81 (66.4%)	68 (56.7%)	76 (56.3%)	-16.0%	-6.2%
Female	41 (33.6%)	52 (43.3%)	59 (43.7%)	+26.8%	+43.9%

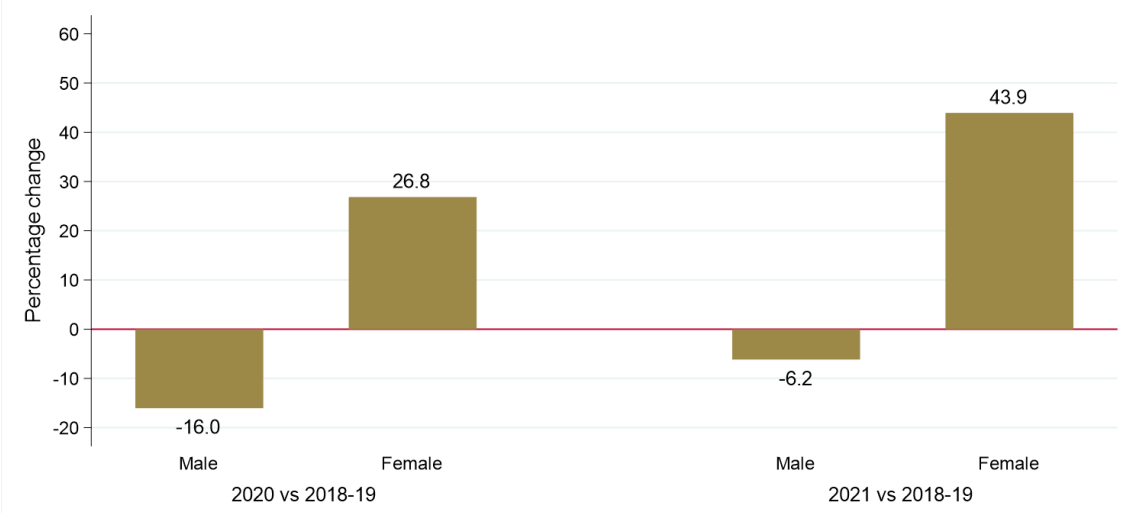
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*

Figure 2: Number of brain cancer cases diagnosed in April-December of 2018-2021 by gender and period of diagnosis

(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



AGE

Excluding the first quarter of each year the number of cases of brain cancer diagnosed among those aged 55 to 64 decreased by 4.5% from 22 per year in 2018-2019 to 21 in 2021. Between the same two time periods the number of cases of brain cancer diagnosed among those aged 0 to 54 increased by 22.9% from 35 per year in 2018-2019 to 43 in 2021. The change in case distribution by age between 2018-2019 and 2021 was not statistically significant.

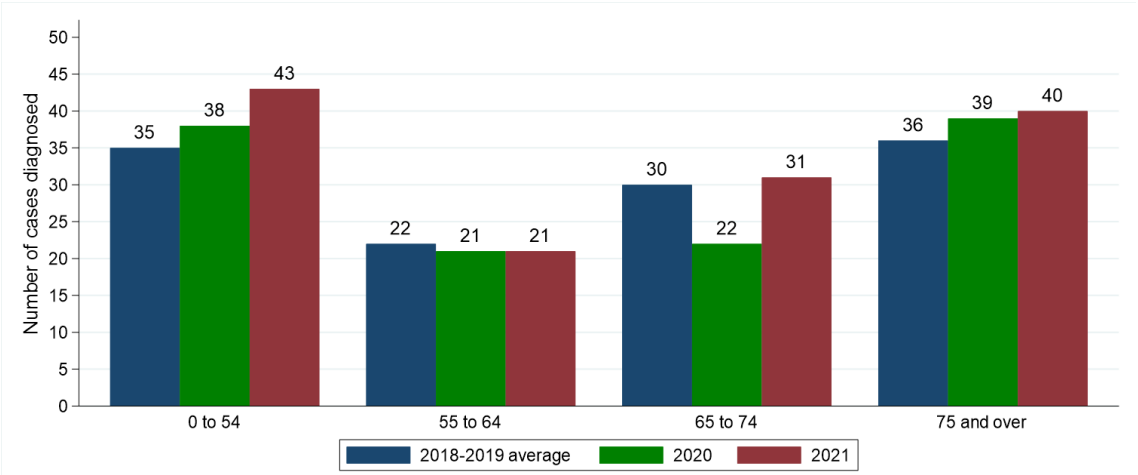
Table 3: Number and proportion of brain cancer cases diagnosed in April-December of 2018-2021 by age and period of diagnosis

Age	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All ages	122	120	135	-1.6%	+10.7%
0 to 54	35 (28.7%)	38 (31.7%)	43 (31.9%)	+8.6%	+22.9%
55 to 64	22 (18.0%)	21 (17.5%)	21 (15.6%)	-4.5%	-4.5%
65 to 74	30 (24.6%)	22 (18.3%)	31 (23.0%)	-26.7%	+3.3%
75 and over	36 (29.5%)	39 (32.5%)	40 (29.6%)	+8.3%	+11.1%

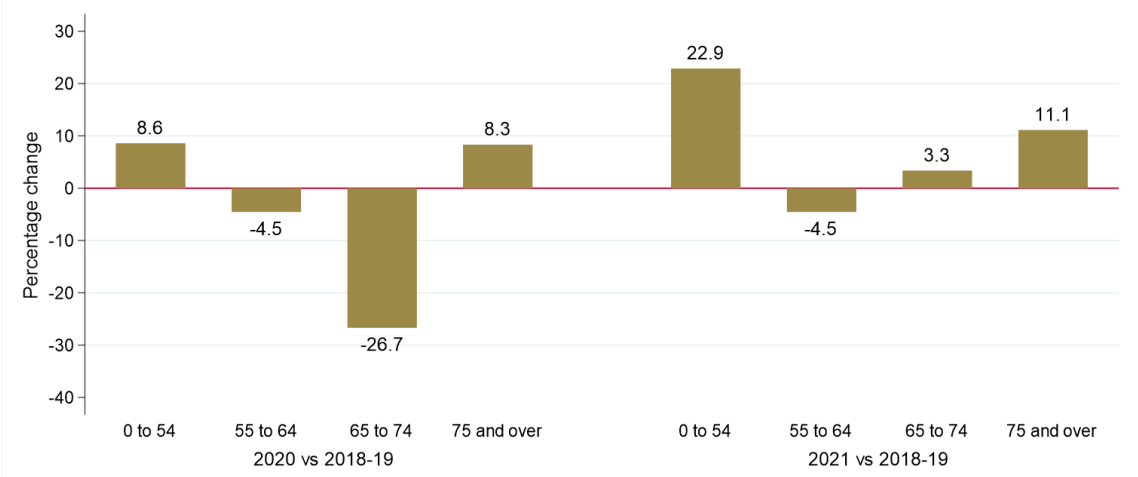
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*

Figure 3: Number of brain cancer cases diagnosed in April-December of 2018-2021 by age and period of diagnosis

(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



HEALTH AND SOCIAL CARE TRUST

Excluding the first quarter of each year the number of cases of brain cancer diagnosed among those resident in Western HSCT did not change between 2018-2019 and 2021 with an average of 21 diagnosed each year. Between the same two time periods the number of cases of brain cancer diagnosed among those resident in South Eastern HSCT increased by 28.0% from 25 per year in 2018-2019 to 32 in 2021. The change in case distribution by Health and Social Care Trust between 2018-2019 and 2021 was not statistically significant.

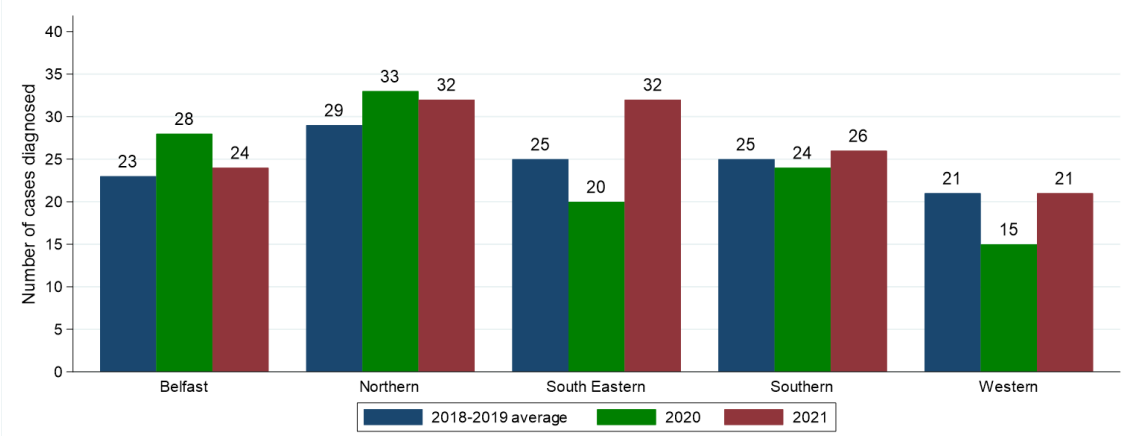
Table 4: Number and proportion of brain cancer cases diagnosed in April-December of 2018-2021 by Health and Social Care Trust and period of diagnosis

Health and Social Care Trust	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
Northern Ireland	122	120	135	-1.6%	+10.7%
Belfast	23 (18.9%)	28 (23.3%)	24 (17.8%)	+21.7%	+4.3%
Northern	29 (23.8%)	33 (27.5%)	32 (23.7%)	+13.8%	+10.3%
South Eastern	25 (20.5%)	20 (16.7%)	32 (23.7%)	-20.0%	+28.0%
Southern	25 (20.5%)	24 (20.0%)	26 (19.3%)	-4.0%	+4.0%
Western	21 (17.2%)	15 (12.5%)	21 (15.6%)	-28.6%	0.0%

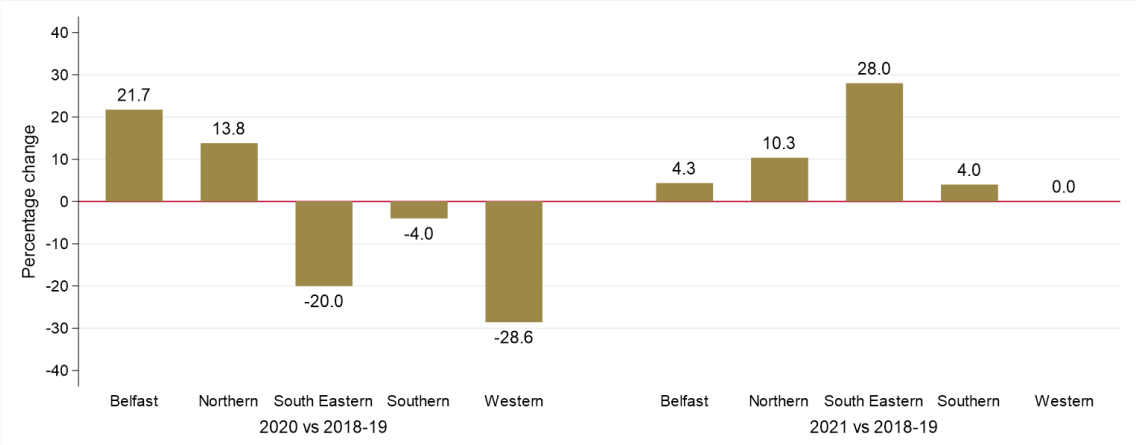
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*
Note: Cases with unknown Health and Social Care Trust are included in totals.

Figure 4: Number of brain cancer cases diagnosed in April-December of 2018-2021 by Health and Social Care Trust and period of diagnosis

(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



SOCIO-ECONOMIC DEPRIVATION

Excluding the first quarter of each year the number of cases of brain cancer diagnosed among those resident in the most deprived quintile did not change between 2018-2019 and 2021 with an average of 21 diagnosed each year. Between the same two time periods the number of cases of brain cancer diagnosed among those resident in the least deprived quintile increased by 29.2% from 24 per year in 2018-2019 to 31 in 2021. The change in case distribution by deprivation quintile between 2018-2019 and 2021 was not statistically significant.

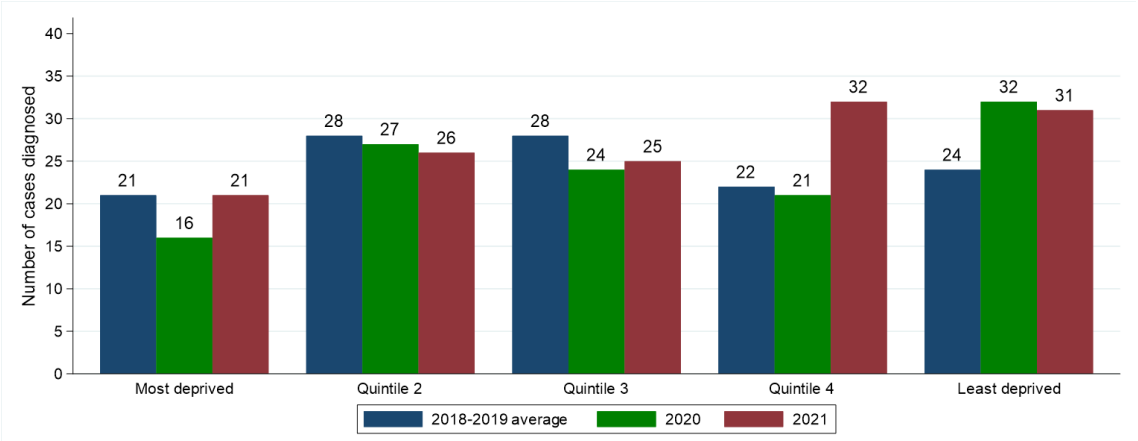
Table 5: Number and proportion of brain cancer cases diagnosed in April-December of 2018-2021 by deprivation quintile and period of diagnosis

Deprivation quintile	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
Northern Ireland	122	120	135	-1.6%	+10.7%
Most deprived	21 (17.2%)	16 (13.3%)	21 (15.6%)	-23.8%	0.0%
Quintile 2	28 (23.0%)	27 (22.5%)	26 (19.3%)	-3.6%	-7.1%
Quintile 3	28 (23.0%)	24 (20.0%)	25 (18.5%)	-14.3%	-10.7%
Quintile 4	22 (18.0%)	21 (17.5%)	32 (23.7%)	-4.5%	+45.5%
Least deprived	24 (19.7%)	32 (26.7%)	31 (23.0%)	+33.3%	+29.2%

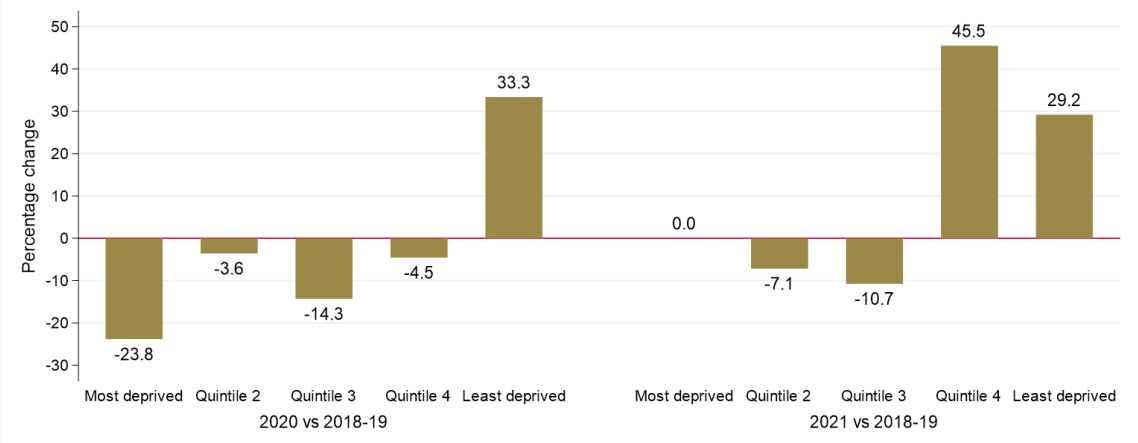
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*
Note: Cases with unknown deprivation quintile are included in totals.

Figure 5: Number of brain cancer cases diagnosed in April-December of 2018-2021 by deprivation quintile and period of diagnosis

(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



BASIS OF DIAGNOSIS

Excluding the first quarter of each year the number of cases of brain cancer diagnosed via histology/cytology increased by 7.1% from 70 per year in 2018-2019 to 75 in 2021. As a proportion of all cases, histology/cytology diagnosis decreased from 57.4% in 2018-2019 to 55.6% in 2021. The change in case distribution by basis of diagnosis between 2018-2019 and 2021 was not statistically significant.

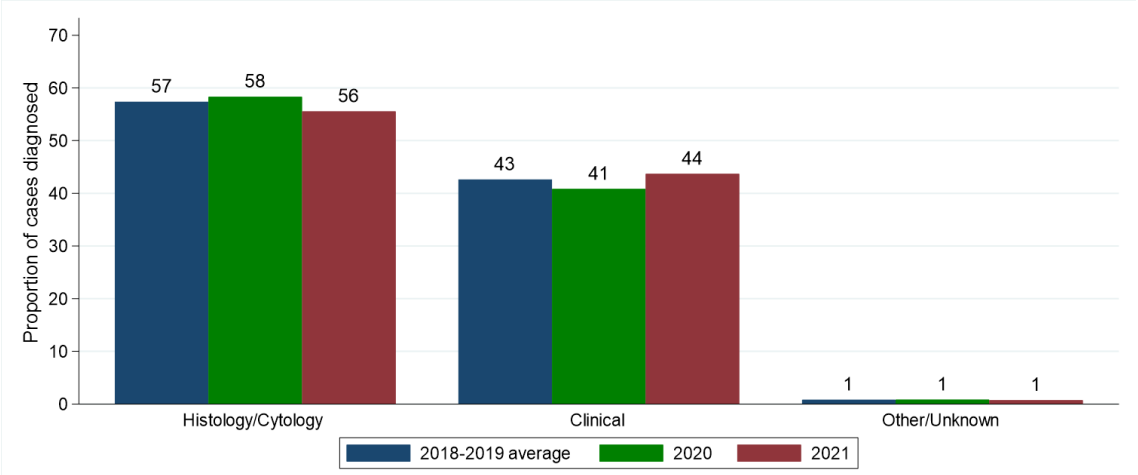
Table 6: Number and proportion of brain cancer cases diagnosed in April-December of 2018-2021 by basis and period of diagnosis

Basis of diagnosis	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All types	122	120	135	-1.6%	+10.7%
Histology/Cytology	70 (57.4%)	70 (58.3%)	75 (55.6%)	0.0%	+7.1%
Clinical	52 (42.6%)	49 (40.8%)	59 (43.7%)	-5.8%	+13.5%
Other/Unknown	1 (0.8%)	1 (0.8%)	1 (0.7%)	-	-

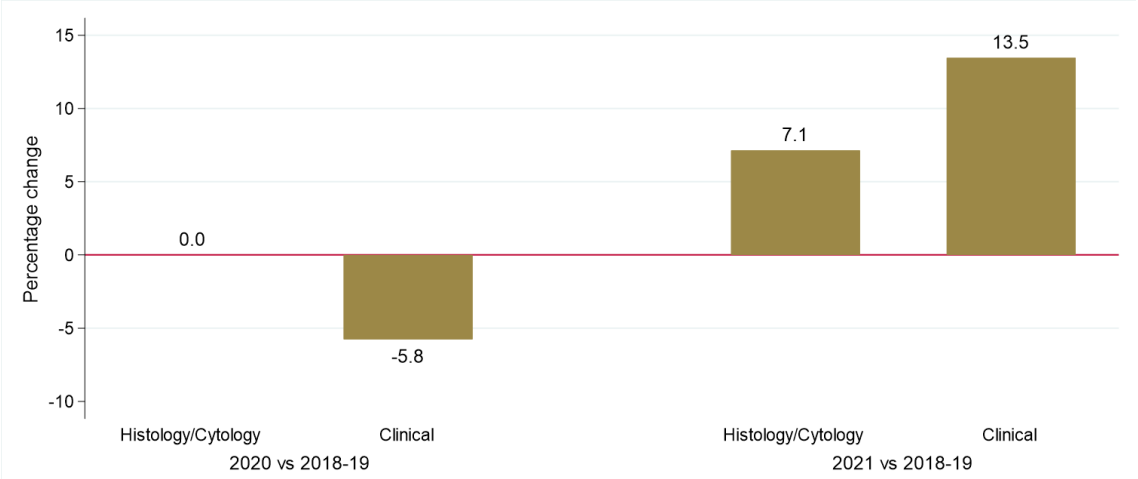
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*

Figure 6: Proportion of brain cancer cases diagnosed in April-December of 2018-2021 by basis and period of diagnosis

(a) Proportion of cases diagnosed



(b) Percentage change over time in number of cases



SURVIVAL

Changes in survival are 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 changes in age-standardised net survival are 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.

OBSERVED SURVIVAL

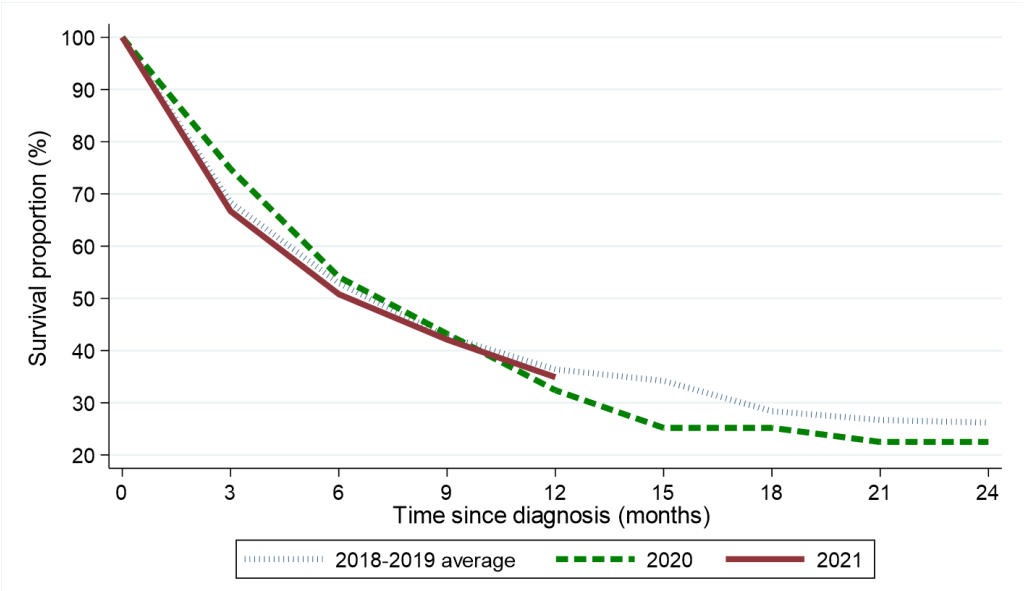
Survival among brain cancer patients six months after diagnosis decreased from 52.9% among those diagnosed in April-December of 2018-2019 to 50.8% among those diagnosed in April-December of 2021. This change was not statistically significant. Between the same two diagnosis periods, one-year survival decreased from 36.4% to 34.9%. This change was not statistically significant. The log-rank test of equality indicates no statistically significant difference between the survival functions for 2018-2019 and 2021 (p=0.680).

Table 7: Observed survival for patients with brain cancer diagnosed in April-December of 2018-2021 by period of diagnosis

Survival time	Period of diagnosis (Apr-Dec)		
	2018-2019	2020	2021
Three months	68.4% (61.9% - 74.1%)	74.8% (65.6% - 81.8%)	66.7% (57.7% - 74.2%)
Six months	52.9% (46.2% - 59.2%)	54.1% (44.4% - 62.8%)	50.8% (41.8% - 59.1%)
One year	36.4% (30.2% - 42.7%)	32.4% (23.9% - 41.2%)	34.9% (26.7% - 43.2%)
Two years	26.2% (20.7% - 32.1%)	22.5% (15.3% - 30.6%)	-

No statistically significant reductions compared to 2018-2019

Figure 7: Observed survival for patients with brain cancer diagnosed in April-December of 2018-2021 by period of diagnosis



DEATHS FROM COVID-19

During 2021 there were no deaths from Covid-19 among brain cancer patients diagnosed at any point since 1993.

NET SURVIVAL

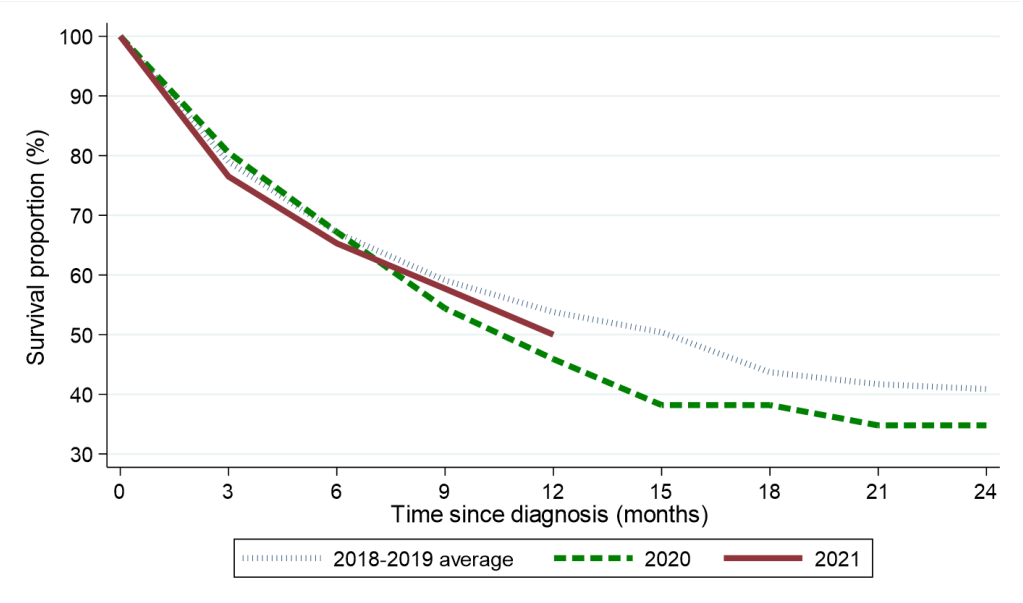
Net survival among brain cancer patients six months after diagnosis decreased from 67.1% among those diagnosed in April-December of 2018-2019 to 65.3% among those diagnosed in April-December of 2021. This change was not statistically significant. Between the same two diagnosis periods, one-year net survival decreased from 53.8% to 50.0%. This change was not statistically significant.

Table 8: Age-standardised net survival for patients with brain cancer diagnosed in April-December of 2018-2021 by period of diagnosis

Survival time	Period of diagnosis (Apr-Dec)		
	2018-2019	2020	2021
Three months	79.0% (73.8% - 84.6%)	80.5% (73.6% - 88.1%)	76.5% (69.5% - 84.2%)
Six months	67.1% (60.5% - 74.4%)	67.2% (57.7% - 78.3%)	65.3% (56.0% - 76.1%)
One year	53.8% (45.2% - 64.1%)	45.9% (33.8% - 62.3%)	50.0% (37.1% - 67.4%)
Two years	40.9% (32.1% - 52.2%)	34.8% (19.9% - 61.0%)	-

No statistically significant reductions compared to 2018-2019

Figure 8: Age-standardised net survival for patients with brain cancer diagnosed in April-December of 2018-2021 by period of diagnosis



Note: All patients are followed up to the end of 2022. This enables calculation of two-year survival for patients diagnosed in 2018-2020, however only survival up to one year from diagnosis can be calculated for patients diagnosed in 2021.

MORTALITY

During the April-December period the number of deaths from brain cancer increased between 2018-2019 and 2021 by 16.0% from 94 deaths per year to 109 deaths.

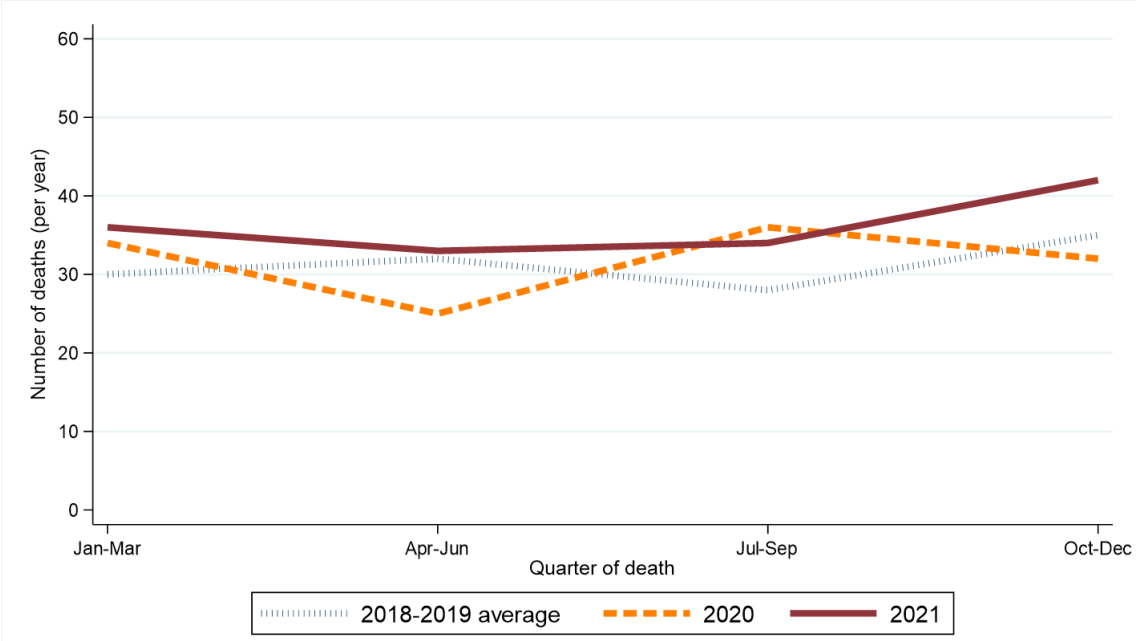
Table 9: Number of brain cancer deaths in 2018-2021 by quarter and year of death

Period of death	Annual total	Quarter of death			
		Jan-Mar	Apr-Jun	Jul-Sept	Oct-Dec
2018-2019*	124	30	32	28	35
2020	127	34	25	36	32
2021	145	36	33	34	42

** Average deaths per year rounded to the nearest integer. Row sums may thus differ slightly from the total.*

Figure 9: Number of brain cancer deaths in 2018-2021 by quarter and year of death

(a) Number of deaths by quarter of death



(b) Percentage change over time in number of deaths by quarter of death