Cancer among young adults

1993-2021

(Excluding non-melanoma skin cancer)

(ICD10 codes: C00-C43, C45-C97; Aged 15-24)

Northern Ireland Cancer Registry, 2024

An official statistics publication

ABOUT THIS REPORT

Contents

This report includes information on incidence of cancer among young adults (excluding non-melanoma skin cancer) as recorded by the Northern Ireland Cancer Registry (NICR). Incidence data is available annually from 1993 to 2021, 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 ten 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 2024. Cancer among young adults: 1993-2021. 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

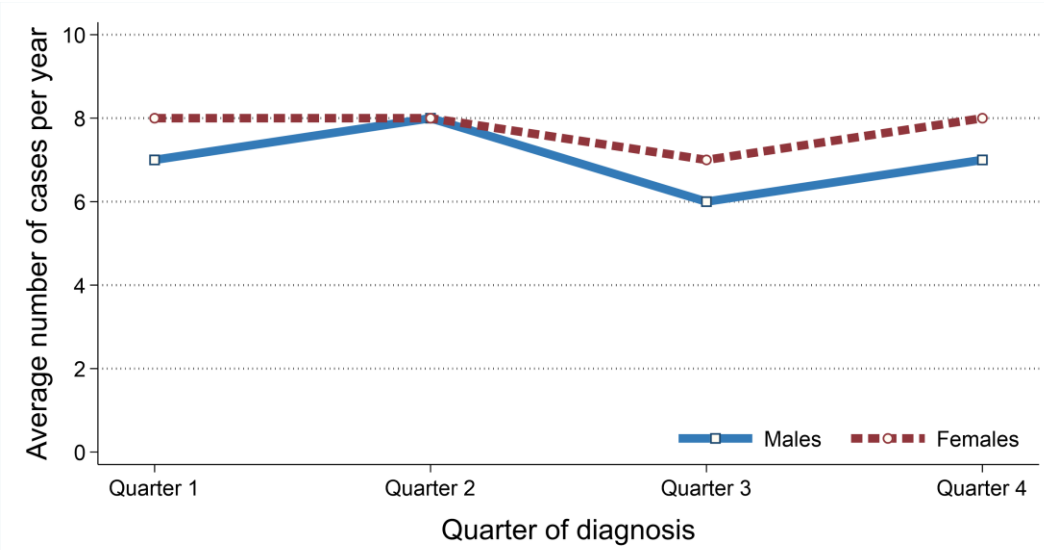
The Northern Ireland Cancer Registry (NICR) uses data provided by patients and collected by the health service as part of their care and support.

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

INCIDENCE

- There were 583 cases of cancer among young adults (excluding non-melanoma skin cancer) diagnosed during 2012-2021 in Northern Ireland. On average this was 58 cases per year.
- During this period 52.5% of young adult cancer cases were among women (Male cases: 277, Female cases: 306). On average there were 28 male and 31 female cases of cancer among young adults per year.
- The most common diagnosis quarter during 2012-2021 was quarter 2 among males with 8 cases per year and quarter 4, quarter 2 and quarter 1 among females with 8 cases per year.

Figure 1: Average number of cases of cancer among young adults per year in 2012-2021 by quarter of diagnosis



Quarter of diagnosis	Average number of cases per year	
	Males	Females
Quarter 1	7	8
Quarter 2	8	8
Quarter 3	6	7
Quarter 4	7	8

- The young adult cancer incidence rates for each gender were 22.9 cases per 100,000 males aged 15 to 24 and 26.8 cases per 100,000 females aged 15 to 24.

INCIDENCE BY CANCER TYPE

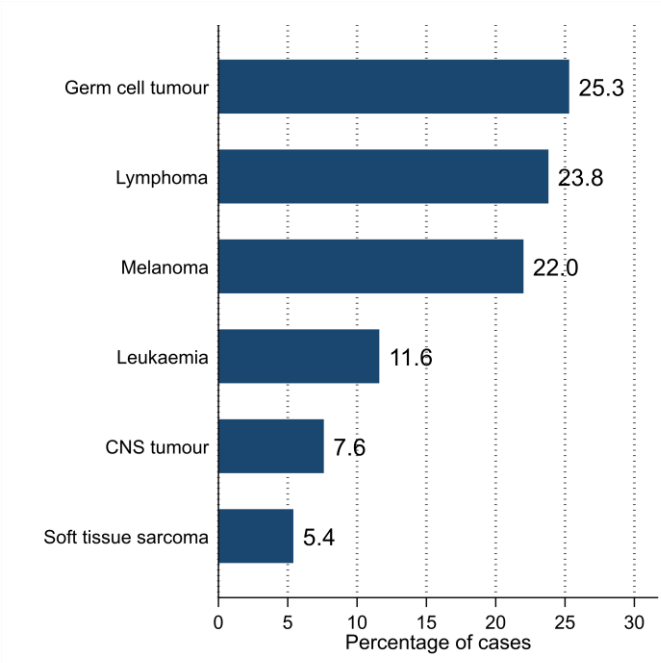
- During 2012-2021 the most common cancer types among males aged 15 to 24 were germ cell tumour, trophoblastic tumour, and neoplasm of gonad (25.3%), lymphoma and reticuloendothelial neoplasm (23.8%) and other malignant epithelial neoplasm and malignant melanoma (22.0%).
- Among females aged 15 to 24 they were other malignant epithelial neoplasm and malignant melanoma (43.5%), lymphoma and reticuloendothelial neoplasm (23.5%) and germ cell tumour, trophoblastic tumour, and neoplasm of gonad (10.8%).

Table 1: Number of cases of cancer among young adults diagnosed in 2012-2021 by cancer type

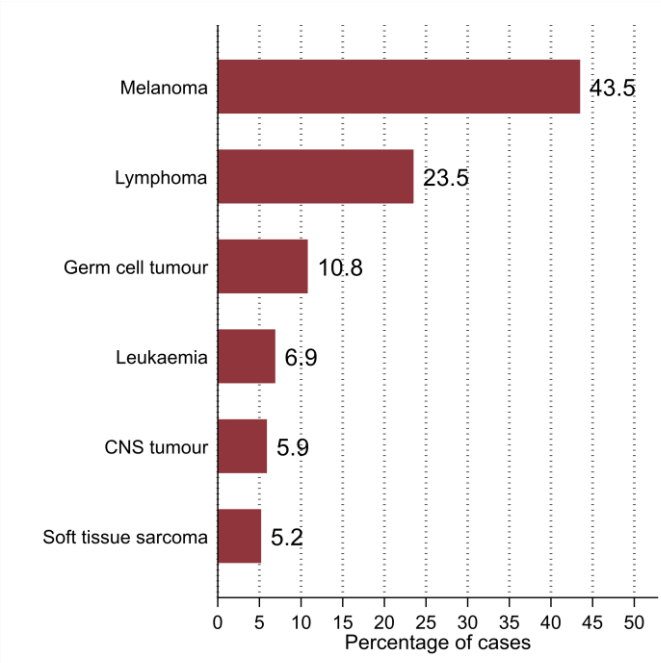
Cancer type	All persons		Male		Female	
	Total cases in period	Average cases per year	Total cases in period	Average cases per year	Total cases in period	Average cases per year
Cancer among young adults	**583**	**58**	**277**	**28**	**306**	**31**
	.	.	.	.	.	.
Central nervous system and miscellaneous intracranial and intraspinal neoplasm	39	4	21	2	18	2
Germ cell tumour, trophoblastic tumour, and neoplasm of gonad	103	10	70	7	33	3
Leukaemia, myeloproliferative disease, and myelodysplastic disease	53	5	32	3	21	2
Lymphoma and reticuloendothelial neoplasm	138	14	66	7	72	7
Other malignant epithelial neoplasm and malignant melanoma	194	19	61	6	133	13
Soft tissue and other extraosseous sarcoma	31	3	15	2	16	2
Other cancer among young adults	25	3	12	1	13	1

Figure 2: Proportion of cases of cancer among young adults in 2012-2021 by cancer type

MALE



FEMALE

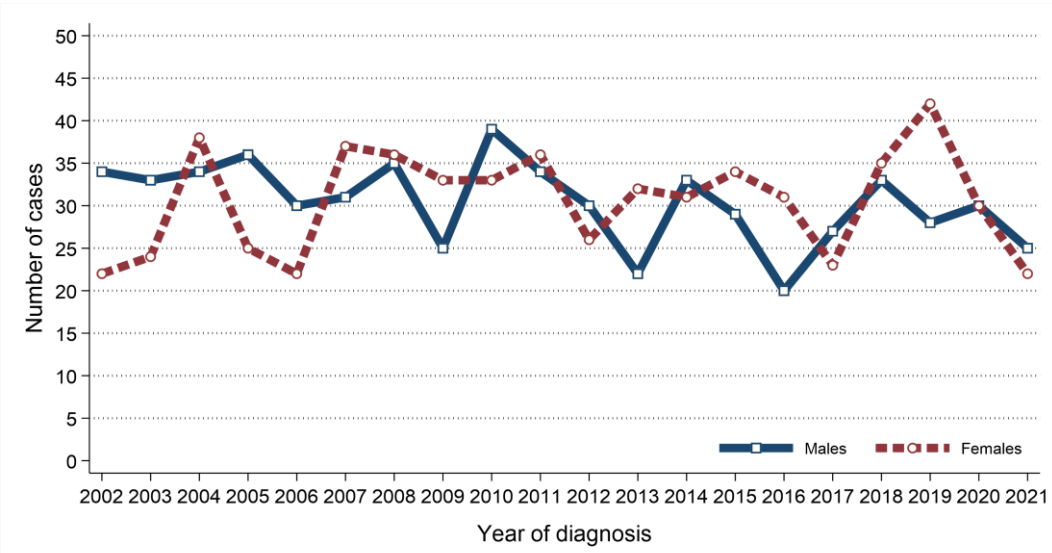


Note: CNS tumour = Central nervous system and miscellaneous intracranial and intraspinal neoplasm, Germ cell tumour = Germ cell tumour, trophoblastic tumour, and neoplasm of gonad, Leukaemia = Leukaemia, myeloproliferative disease, and myelodysplastic disease, Lymphoma = Lymphoma and reticuloendothelial neoplasm, Melanoma = Other malignant epithelial neoplasm and malignant melanoma, Soft tissue sarcoma = Soft tissue and other extraosseous sarcoma.

INCIDENCE TRENDS

- The number of cases of young adult cancer among males increased between 2012-2016 and 2017-2021 by 6.7% from 134 cases (27 cases per year) to 143 cases (29 cases per year).
- The number of cases of young adult cancer among females decreased between 2012-2016 and 2017-2021 by 1.3% from 154 cases (31 cases per year) to 152 cases (30 cases per year).

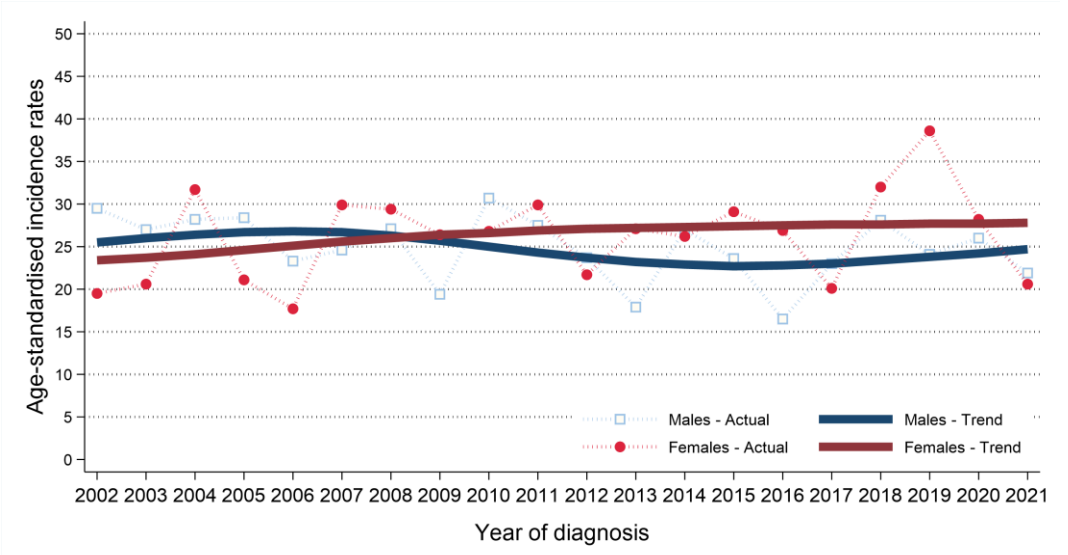
Figure 3: Trends in number of cases of cancer among young adults diagnosed from 2002 to 2021



Year of diagnosis	Number of cases	
	Males	Females
2012	30	26
2013	22	32
2014	33	31
2015	29	34
2016	20	31
2017	27	23
2018	33	35
2019	28	42
2020	30	30
2021	25	22

- Male age-standardised young adult cancer incidence rates increased between 2012-2016 and 2017-2021 by 12.8% from 21.8 to 24.6 cases per 100,000 males aged 15 to 24. This change was not statistically significant.
- Female age-standardised young adult cancer incidence rates increased between 2012-2016 and 2017-2021 by 6.5% from 26.2 to 27.9 cases per 100,000 females aged 15 to 24. This change was not statistically significant.

Figure 4: Trends in incidence rates of cancer among young adults from 2002 to 2021



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).

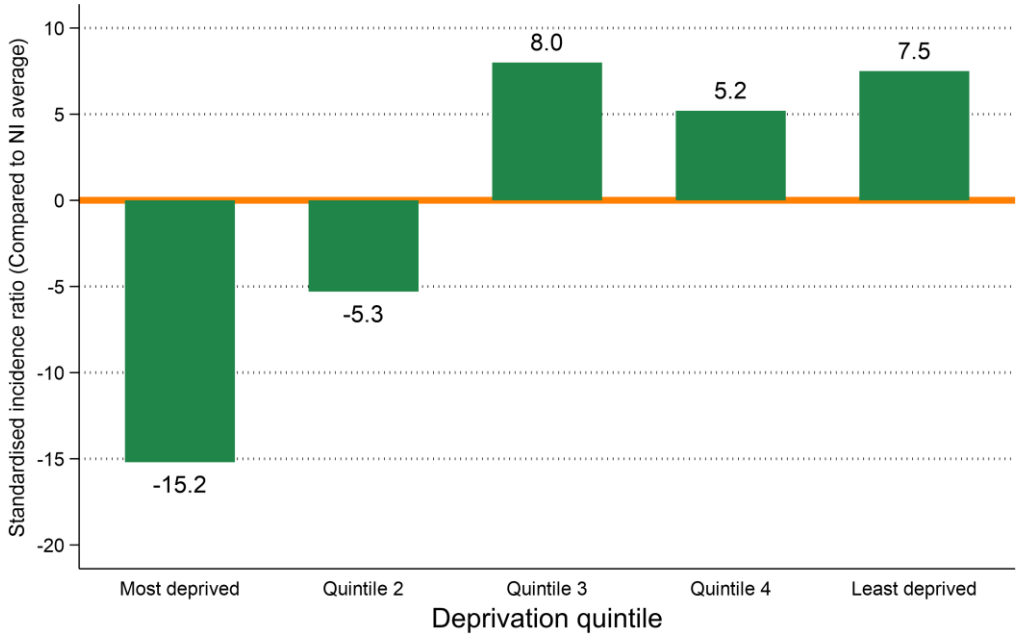
INCIDENCE BY DEPRIVATION

- The number of cases of cancer among young adults diagnosed during 2012-2021 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 2: Number of cases of cancer among young adults diagnosed in 2012-2021 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	**583**	**58**	**277**	**28**	**306**	**31**
	.	.	.	.	.	.
Most deprived	100	10	49	5	51	5
Quintile 2	110	11	52	5	58	6
Quintile 3	136	14	60	6	76	8
Quintile 4	121	12	62	6	59	6
Least deprived	116	12	54	5	62	6
Unknown	0	0	0	0	0	0

Figure 5: Standardised incidence ratio comparing deprivation quintile to Northern Ireland for cancer among young adults diagnosed in 2012-2021



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.

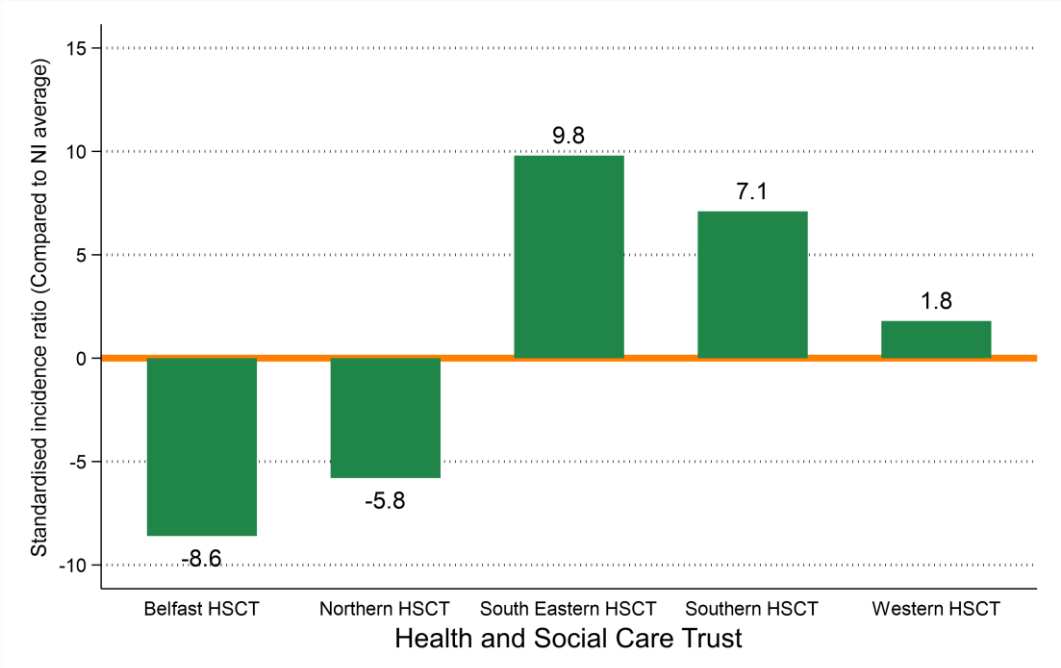
INCIDENCE BY HEALTH AND SOCIAL CARE TRUST

- The number of cases of cancer among young adults diagnosed during 2012-2021 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 3: Number of cases of cancer among young adults diagnosed in 2012-2021 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	**583**	**58**	**277**	**28**	**306**	**31**
	.	.	.	.	.	.
Belfast HSCT	120	12	55	6	65	7
Northern HSCT	136	14	67	7	69	7
South Eastern HSCT	111	11	58	6	53	5
Southern HSCT	121	12	49	5	72	7
Western HSCT	95	10	48	5	47	5
Unknown	0	0	0	0	0	0

Figure 6: Standardised incidence ratio comparing Health and Social Care Trust to Northern Ireland for cancer among young adults diagnosed in 2012-2021



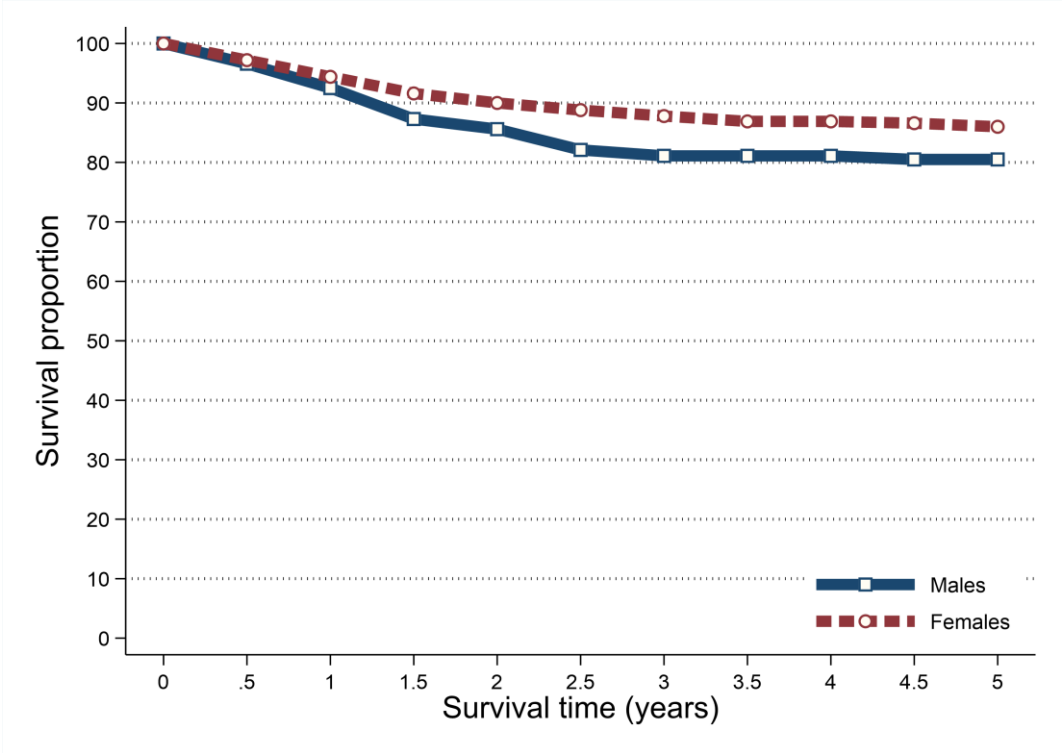
SURVIVAL

- 93.4% of patients aged 15 to 24 were alive one year and 83.2% were alive five years from a cancer diagnosis in 2007-2016. (observed survival)
- Among young adults net survival (NS), which removes the effect of deaths from causes unrelated to cancer, was 93.5% one year and 83.4% five years from a cancer diagnosis in 2007-2016.
- Five-year survival (NS) from cancer among young adults diagnosed in 2007-2016 was 80.5% among men and 86.0% among women.

Table 4: Survival from cancer among young adults diagnosed in 2007-2016

Time since diagnosis	All persons		Male		Female	
	Observed survival	Net survival	Observed survival	Net survival	Observed survival	Net survival
6 months	96.9%	96.9%	96.6%	96.6%	97.2%	97.2%
One year	93.4%	93.5%	92.4%	92.5%	94.4%	94.4%
Two years	87.8%	87.9%	85.5%	85.6%	90.0%	90.0%
Five years	83.2%	83.4%	80.2%	80.5%	85.9%	86.0%

Figure 7: Net survival from cancer among young adults diagnosed in 2007-2016



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.

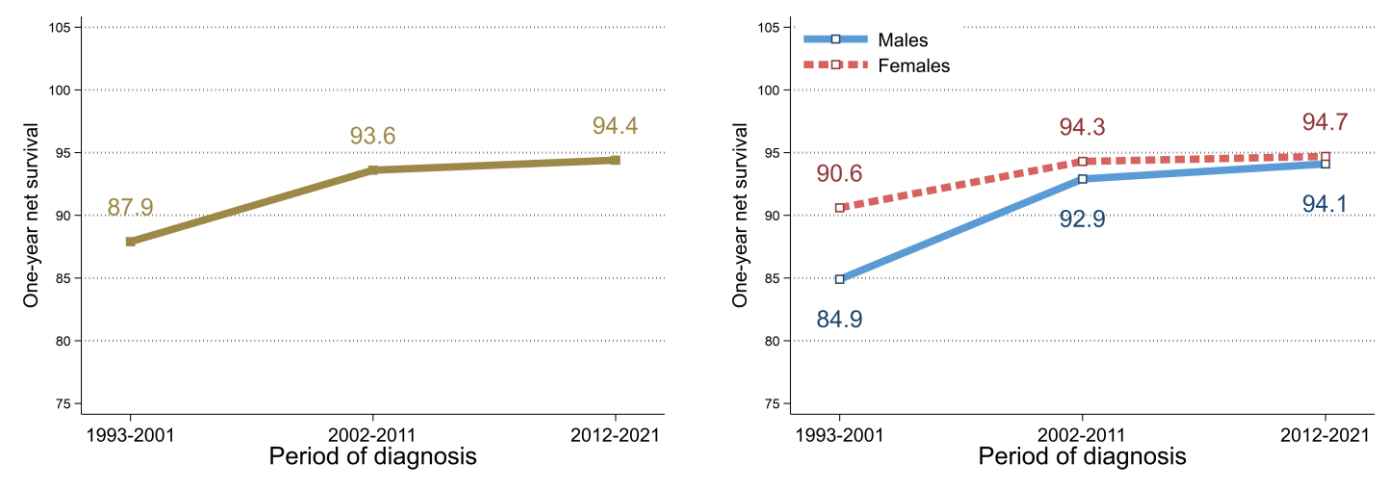
Net survival provides an estimate of patient survival which has been adjusted to take account of deaths unrelated to cancer. It is more widely used to assess the impact of changes in cancer care on patient survival.

SURVIVAL TRENDS

ONE-YEAR NET SURVIVAL

- Between 2002-2011 and 2012-2021 there was no significant change in one-year survival (NS) from cancer among young adults.
- Between 1993-2001 and 2012-2021 there was a significant increase from 87.9% to 94.4% in one-year survival (NS) from cancer among young adults. This increase was significant for males (84.9% to 94.1%) but not females.

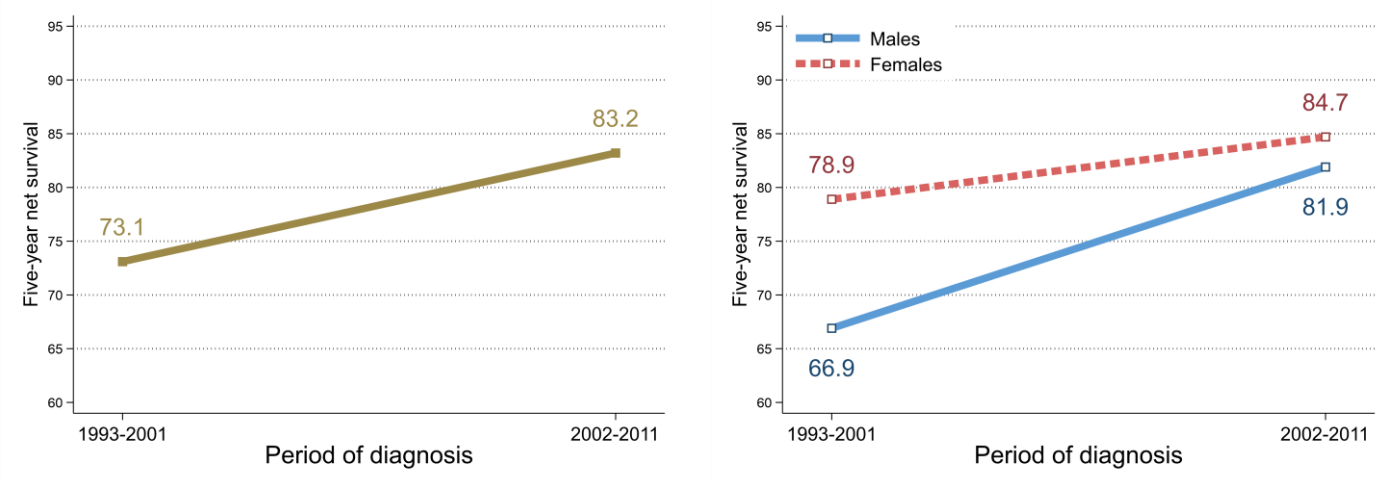
Figure 8: Trends in one-year net survival from cancer among young adults in 1993-2021



FIVE-YEAR NET SURVIVAL

- Between 1993-2001 and 2002-2011 there was a significant increase from 73.1% to 83.2% in five-year survival (NS) from cancer among young adults. This increase was significant for males (66.9% to 81.9%) but not females.

Figure 9: Trends in five-year net survival from cancer among young adults in 1993-2011

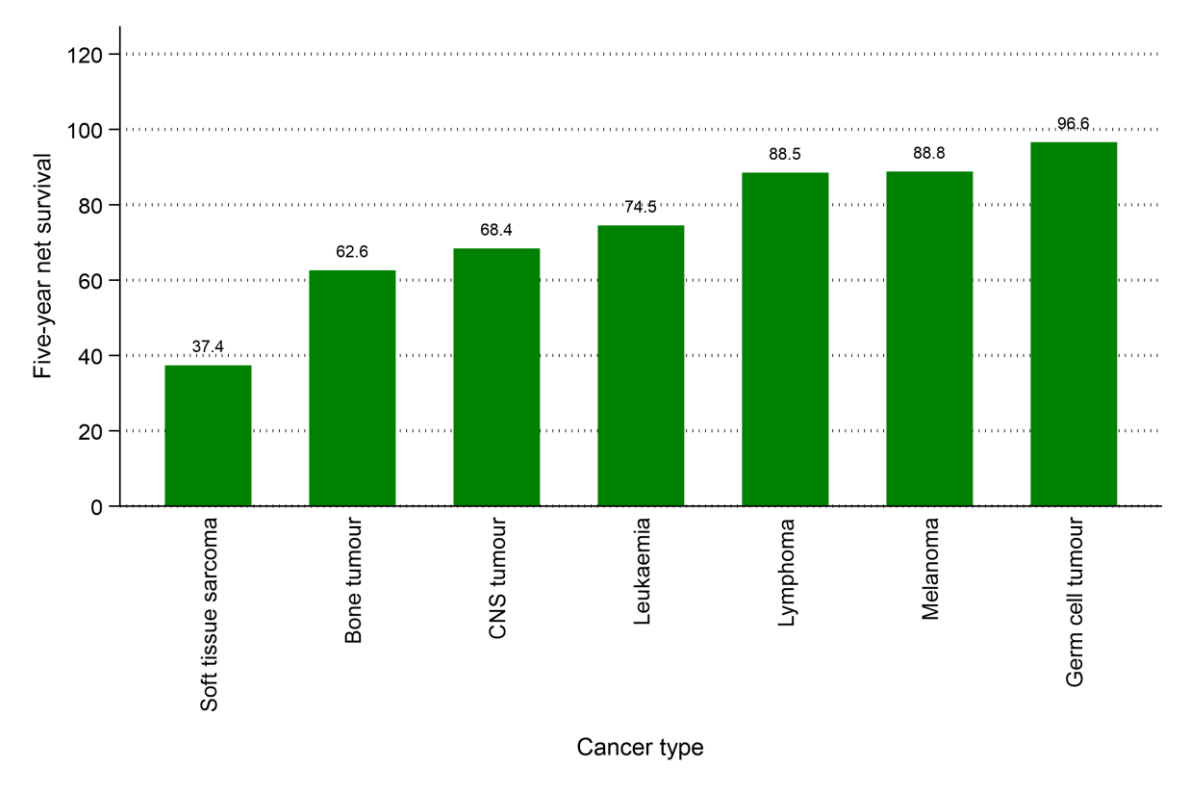


SURVIVAL BY CANCER TYPE

- Five-year survival (ASNS) for young adults aged 15 to 24 and diagnosed in 2007-2016 ranged from 96.6% for germ cell tumour, trophoblastic tumour, and neoplasm of gonad to 37.4% for soft tissue and other extraosseous sarcoma.

- In particular five-year survival (ASNS) for the most common cancer types was 88.8% for other malignant epithelial neoplasm and malignant melanoma, 88.5% for lymphoma and reticuloendothelial neoplasm, 96.6% for germ cell tumour, trophoblastic tumour, and neoplasm of gonad and 68.4% for central nervous system and miscellaneous intracranial and intraspinal neoplasm.

Figure 10: Five-year net survival from cancer among young adults diagnosed in 2007-2016 by cancer type



Note: CNS tumour = Central nervous system and miscellaneous intracranial and intraspinal neoplasm, Germ cell tumour = Germ cell tumour, trophoblastic tumour, and neoplasm of gonad, Leukaemia = Leukaemia, myeloproliferative disease, and myelodysplastic disease, Lymphoma = Lymphoma and reticuloendothelial neoplasm, Melanoma = Other malignant epithelial neoplasm and malignant melanoma, Soft tissue sarcoma = Soft tissue and other extraosseous sarcoma.

- Five-year survival (NS) did not change significantly for any cancer type among young adults aged 15 to 24 between 1997-2006 and 2007-2016.

Table 5: Trends in five-year net survival from cancer among young adults diagnosed in 1997-2016

Cancer type	All persons	
	1997-2006	2007-2016
Central nervous system and miscellaneous intracranial and intraspinal neoplasm	65.2%	68.4%
Germ cell tumour, trophoblastic tumour, and neoplasm of gonad	87.8%	96.6%
Leukaemia, myeloproliferative disease, and myelodysplastic disease	51.9%	74.5%
Lymphoma and reticuloendothelial neoplasm	87.6%	88.5%
Malignant bone tumour	67.9%	62.6%
Other malignant epithelial neoplasm and malignant melanoma	89.9%	88.8%
Soft tissue and other extraosseous sarcoma	53.7%	37.4%

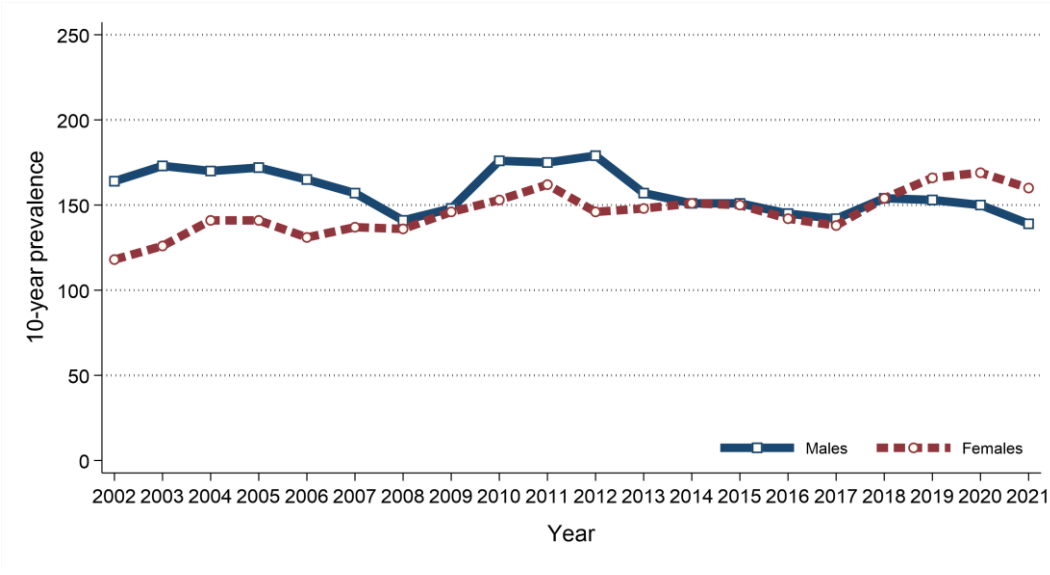
PREVALENCE

- At the end of 2021, there were 532 young adults aged 15 to 24 (Males: 272; Females: 260) living with cancer who had been diagnosed with the disease during 1997-2021.
- Of these 7.9% had been diagnosed in the previous year (one-year prevalence) and 56.2% in the previous 10 years (ten-year prevalence).
- At the end of 2021 the most prevalent cancer types among young adults were leukaemia, myeloproliferative disease, and myelodysplastic disease (131 survivors) and lymphoma and reticuloendothelial neoplasms (105 survivors).

PREVALENCE TRENDS

- 10-year prevalence of cancer among males aged 15 to 24 decreased between 2016 and 2021 by 4.1% from 145 survivors to 139 survivors.
- 10-year prevalence of cancer among females aged 15 to 24 increased between 2016 and 2021 by 12.7% from 142 survivors to 160 survivors.

Figure 11: Trends in 10-year prevalence of cancer among young adults in 2002-2021

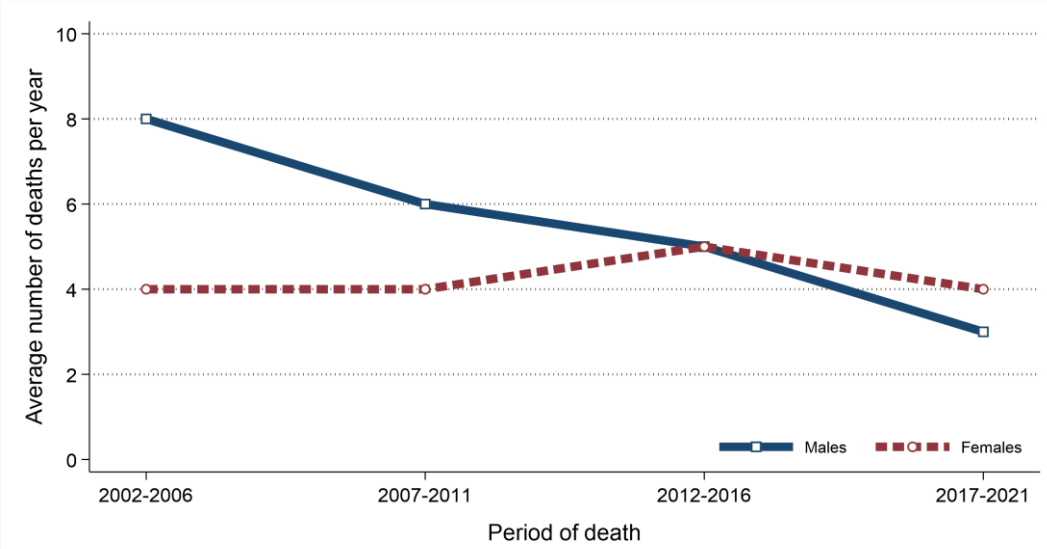


Year	10-year prevalence	
	Males	Females
2012	179	146
2013	157	148
2014	151	151
2015	151	150
2016	145	142
2017	142	138
2018	154	154
2019	153	166
2020	150	169
2021	139	160

MORTALITY

- There were 82 deaths from cancer among young adults (excluding non-melanoma skin cancer) during 2012-2021 in Northern Ireland. On average this was 8 deaths per year.
- During this period 51.2% of cancer deaths among young adults were among women (Male deaths: 40, Female deaths: 42). On average there were 4 male and 4 female deaths from young adult cancer per year.
- The number of deaths from cancer among males aged 15 to 24 decreased between 2012-2016 and 2017-2021 by 46.2% from 26 deaths (5 deaths per year) to 14 deaths (3 deaths per year).
- The number of deaths from cancer among females aged 15 to 24 decreased between 2012-2016 and 2017-2021 by 17.4% from 23 deaths (5 deaths per year) to 19 deaths (4 deaths per year).

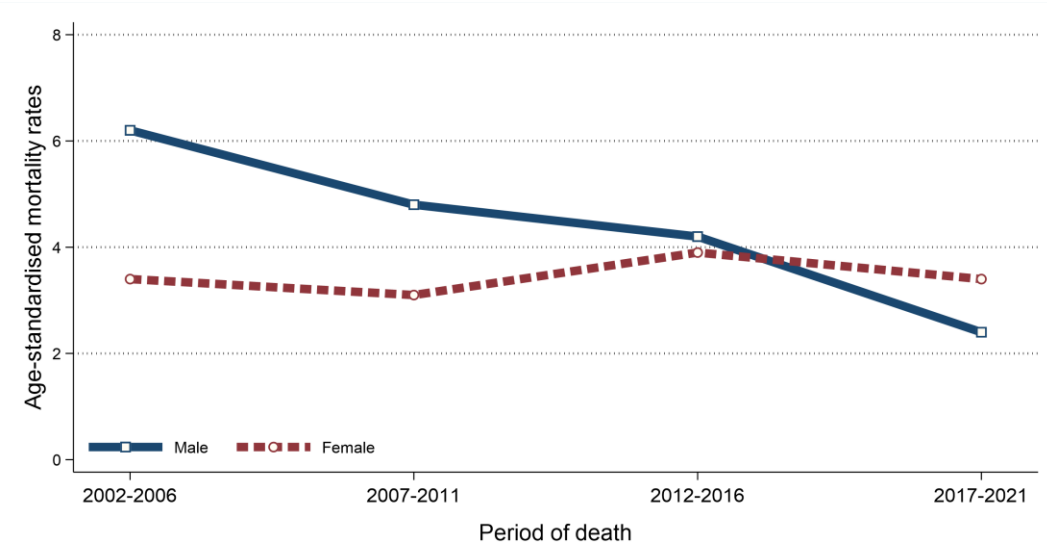
Figure 12: Trends in average number of deaths per year from cancer among young adults from 2002 to 2021



Period of death	Average number of deaths per year	
	Male	Female
2002-2006	8	4
2007-2011	6	4
2012-2016	5	5
2017-2021	3	4

- Male age-standardised young adult cancer mortality rates decreased between 2012-2016 and 2017-2021 by 42.9% from 4.2 to 2.4 deaths per 100,000 males aged 15 to 24. This change was not statistically significant.
- Female age-standardised young adult cancer mortality rates decreased between 2012-2016 and 2017-2021 by 12.8% from 3.9 to 3.4 deaths per 100,000 females aged 15 to 24. This change was not statistically significant.

Figure 13: Trends in mortality rates of cancer among young adults from 2002 to 2021



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 Jan 2023 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. cancer among young adults 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. cancer among young adults 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 2021 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.