Lung cancer

1993-2021

(Including trachea)

(ICD10 codes: C33-C34)

Northern Ireland Cancer Registry, 2023

An official statistics publication

ABOUT THIS REPORT

Contents

This report includes information on incidence of lung cancer (including trachea) 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 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

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Northern Ireland Cancer Registry 2023. Lung cancer: 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

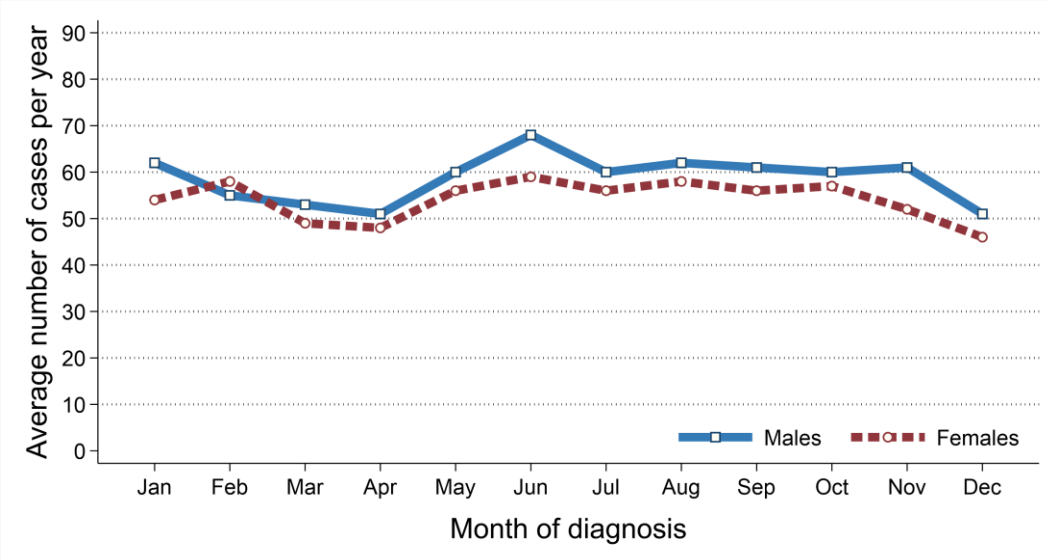
The Northern Ireland Cancer Registry (NICR) uses data provided by patients and collected by the health service as part of their care and support.

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

INCIDENCE

- There were 6,768 cases of lung cancer (including trachea) diagnosed during 2017-2021 in Northern Ireland. On average this was 1,354 cases per year.
- During this period 47.9% of lung cancer cases were among women (Male cases: 3,524, Female cases: 3,244). On average there were 705 male and 649 female cases of lung cancer per year.
- The most common diagnosis month during 2017-2021 was June among males with 68 cases per year and June among females with 59 cases per year.

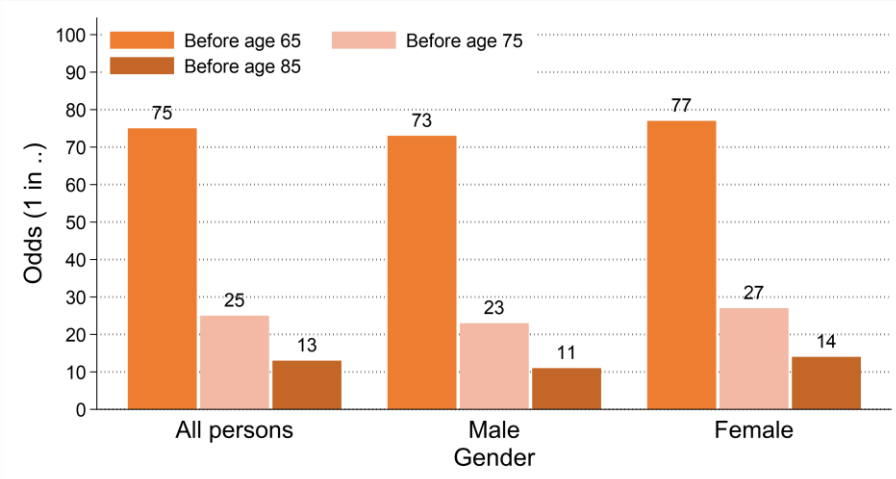
Figure 1: Average number of cases of lung cancer per year in 2017-2021 by month of diagnosis



Month of diagnosis	Average number of cases per year	
	Males	Females
January	62	54
February	55	58
March	53	49
April	51	48
May	60	56
June	68	59
July	60	56
August	62	58
September	61	56
October	60	57
November	61	52
December	51	46

- The lung cancer incidence rates for each gender were 75.8 cases per 100,000 males and 67.6 cases per 100,000 females.
- The odds of developing lung cancer before age 85 was 1 in 11 for men and 1 in 14 for women.

Figure 2: Odds of developing lung cancer in 2017-2021



INCIDENCE BY AGE

- The median age of patients diagnosed with lung cancer during 2017-2021 was 73 years (Males: 73, Females: 72).
- The risk of developing lung cancer varied by age, with 42.5% of men and 41.8% of women diagnosed with lung cancer aged 75 and over at diagnosis.
- In contrast, 5.7% of patients diagnosed with lung cancer were aged 0 to 54 at diagnosis.

Figure 3: Average number of cases of lung cancer diagnosed per year in 2017-2021 by age at diagnosis

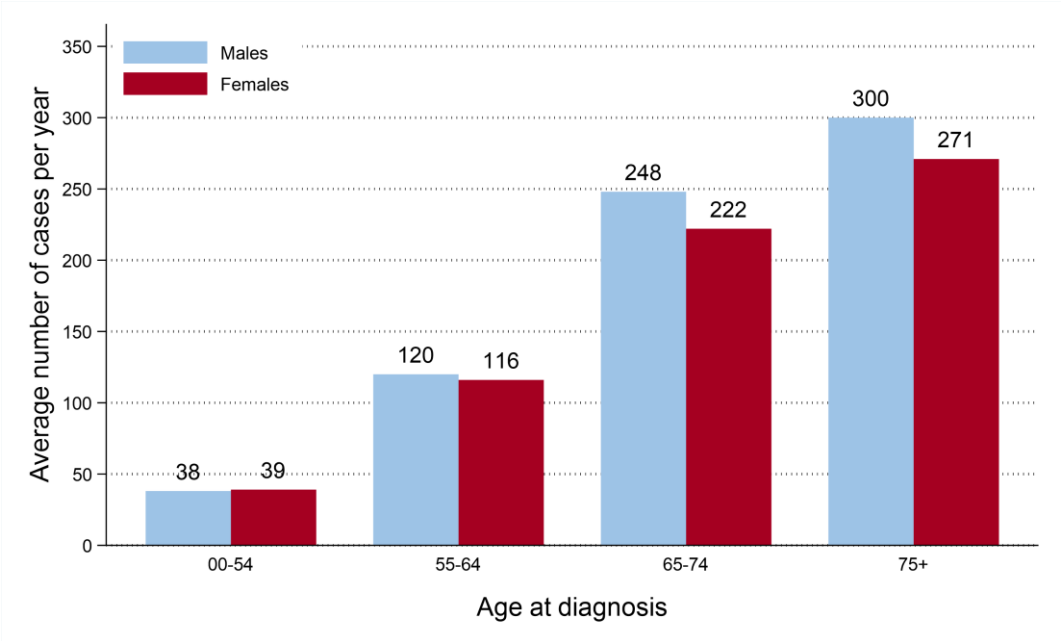
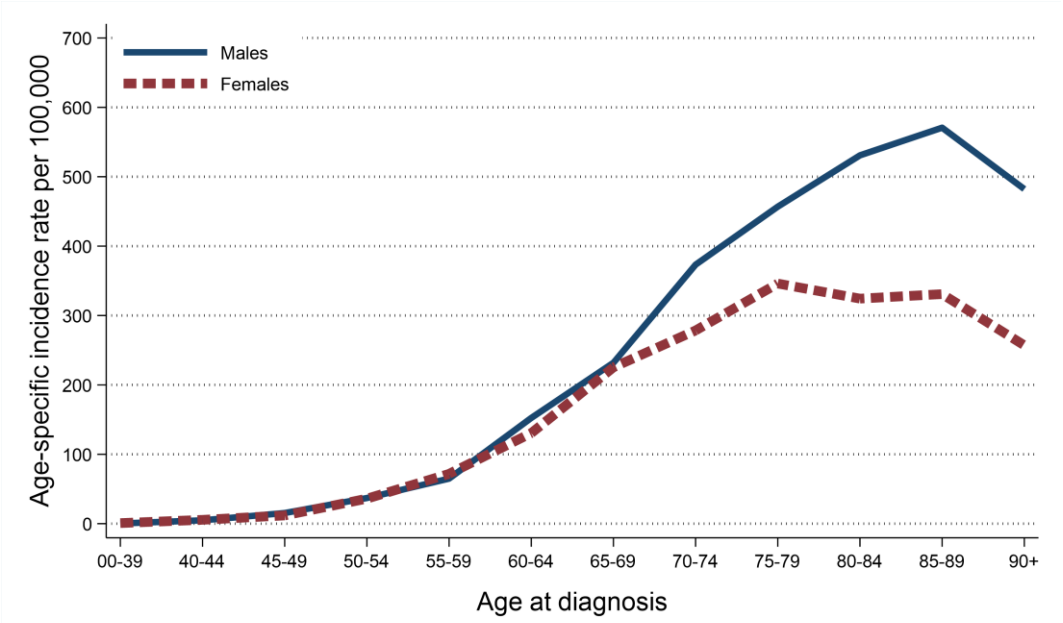


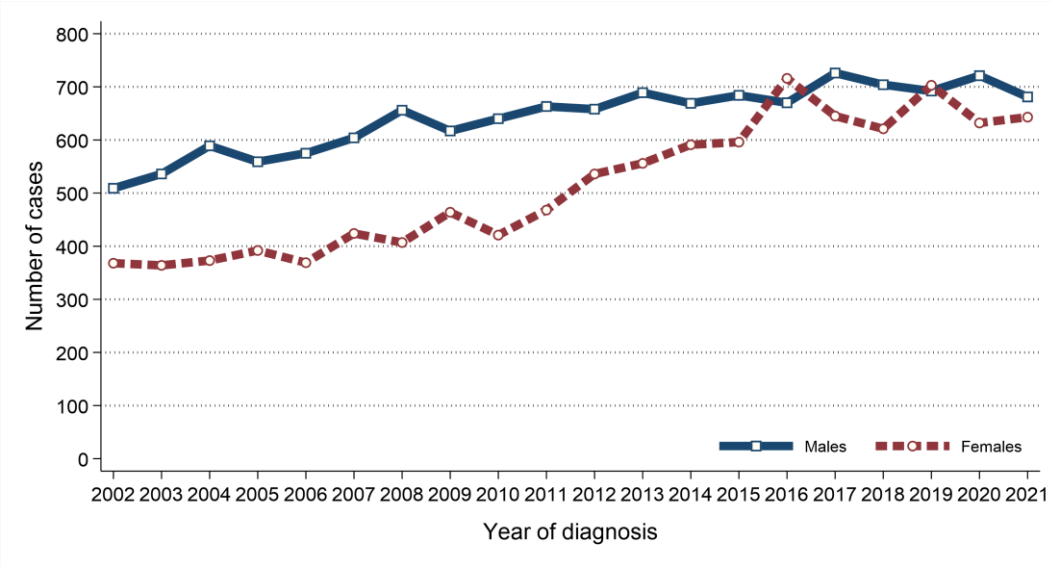
Figure 4: Age-specific incidence rates of lung cancer in 2017-2021



INCIDENCE TRENDS

- The number of cases of lung cancer among males increased between 2012-2016 and 2017-2021 by 4.6% from 3,370 cases (674 cases per year) to 3,524 cases (705 cases per year).
- The number of cases of lung cancer among females increased between 2012-2016 and 2017-2021 by 8.3% from 2,995 cases (599 cases per year) to 3,244 cases (649 cases per year).

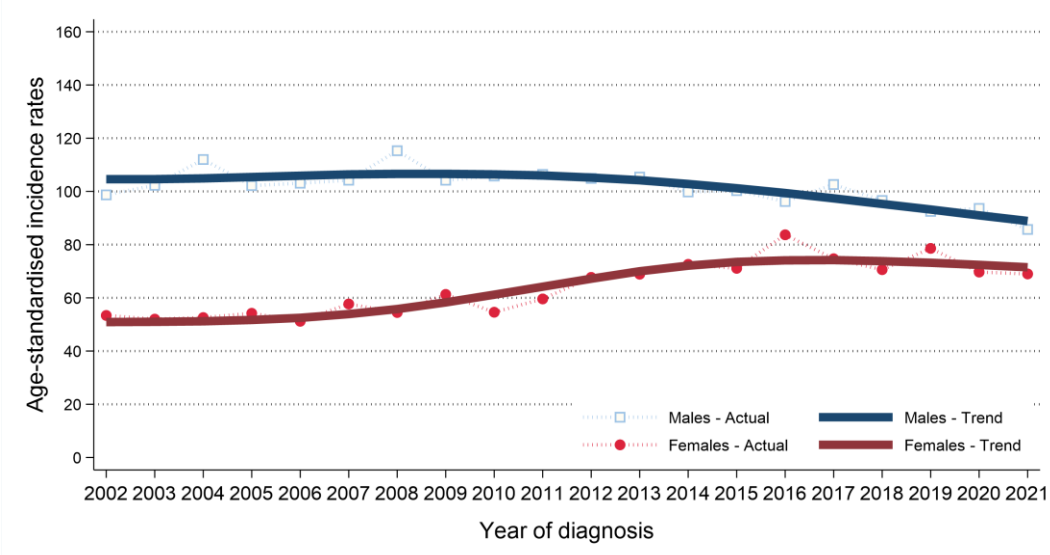
Figure 5: Trends in number of cases of lung cancer diagnosed from 2002 to 2021



Year of diagnosis	Number of cases	
	Males	Females
2012	658	536
2013	689	556
2014	669	591
2015	684	596
2016	670	716
2017	726	645
2018	704	621
2019	692	703
2020	721	632
2021	681	643

- Male age-standardised lung cancer incidence rates decreased between 2012-2016 and 2017-2021 by 7.1% from 101.1 to 93.9 cases per 100,000 males. This change was statistically significant.
- Female age-standardised lung cancer incidence rates decreased between 2012-2016 and 2017-2021 by 0.5% from 72.9 to 72.5 cases per 100,000 females. This change was not statistically significant.

Figure 6: Trends in incidence rates of lung cancer 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 TRENDS BY AGE

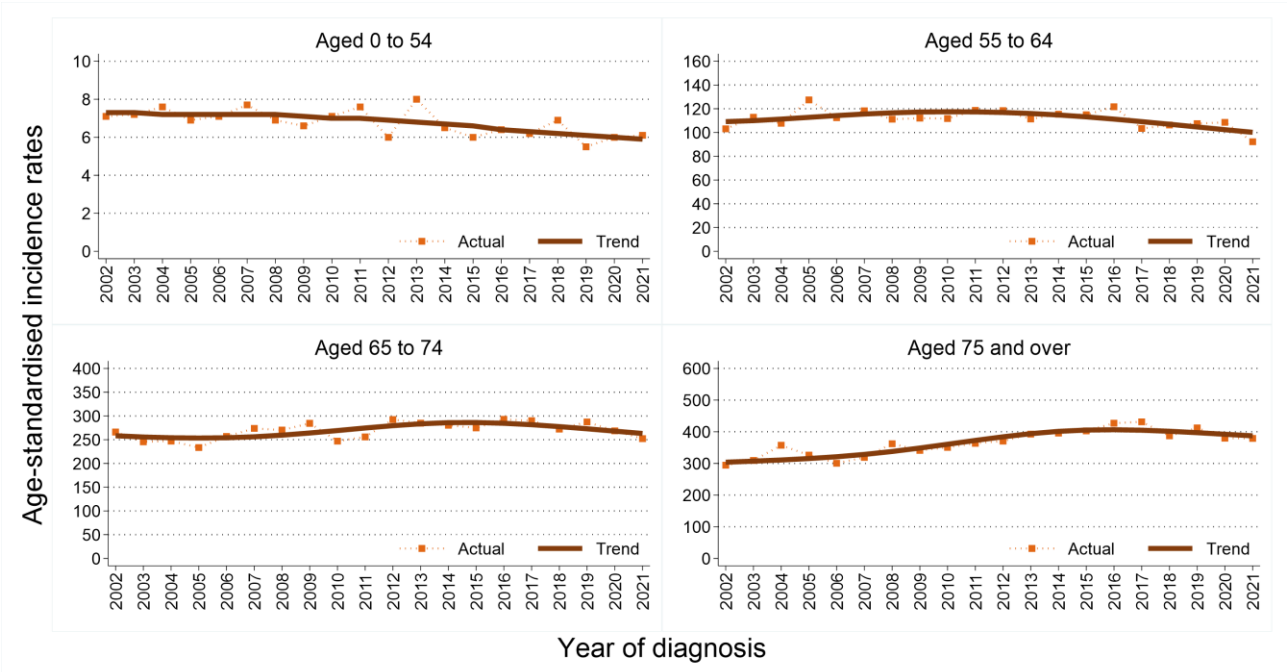
- Between 2012-2016 and 2017-2021 the number of cases of lung cancer among
  - Persons aged 0 to 54 decreased by 9.2% among males and decreased by 1.5% among females.
  - Persons aged 55 to 64 increased by 0.2% among males and did not change among females.
  - Persons aged 65 to 74 decreased by 0.1% among males and increased by 11.2% among females.
  - Persons aged 75 and over increased by 13.1% among males and increased by 11.5% among females.

Table 1: Average number of cases per year of lung cancer by period of diagnosis in 2012-2021

Age at diagnosis	All persons		Male		Female	
	2012-2016	2017-2021	2012-2016	2017-2021	2012-2016	2017-2021
All ages	**1,273**	**1,354**	**674**	**705**	**599**	**649**
	.	.	.	.	.	.
0 to 54	81	77	41	38	40	39
55 to 64	235	235	119	120	116	116
65 to 74	448	470	248	248	200	222
75 and over	508	571	265	300	243	271

- Between 2012-2016 and 2017-2021 age-standardised incidence rates of lung cancer among
  - Persons aged 0 to 54 did not change significantly among males or females.
  - Persons aged 55 to 64 did not change significantly among males or females.
  - Persons aged 65 to 74 did not change significantly among males or females.
  - Persons aged 75 and over did not change significantly among males or females.

Figure 7: Trends in incidence rates of lung cancer from 2002 to 2021 by age group



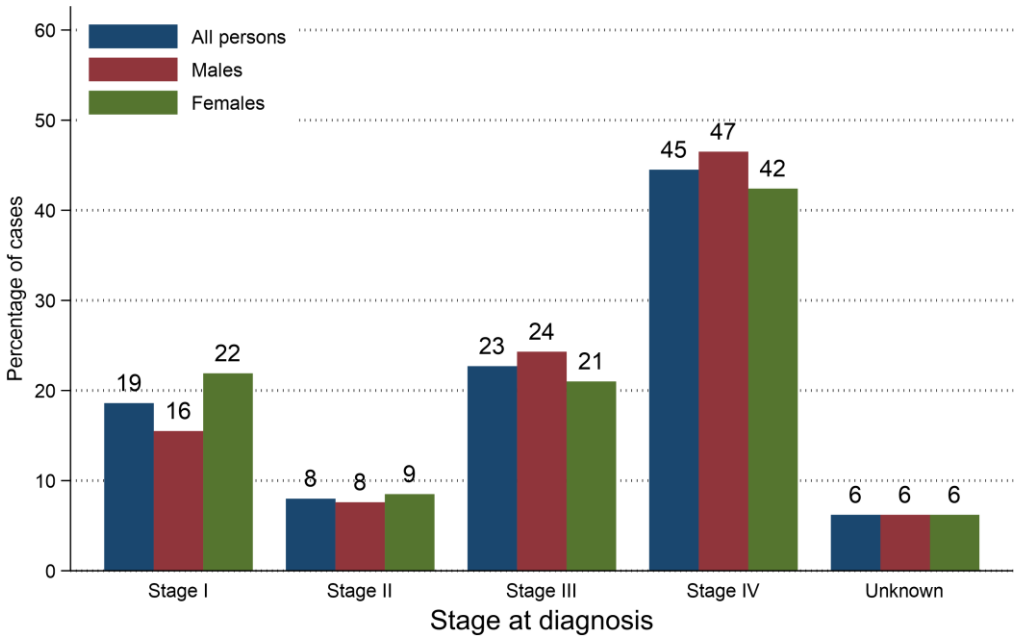
INCIDENCE BY STAGE AT DIAGNOSIS

- During 2017-2021 93.8% of lung cancer cases had a stage assigned.
- 18.6% of lung cancer cases were diagnosed at Stage I. (19.8% of staged cases)
- 44.5% of lung cancer cases were diagnosed at Stage IV. (47.4% of staged cases)

Table 2: Number of cases of lung cancer diagnosed in 2017-2021 by stage at diagnosis

Stage at diagnosis	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
All stages	**6,768**	**1,354**	**3,524**	**705**	**3,244**	**649**
	.	.	.	.	.	.
Stage I	1,257	251	545	109	712	142
Stage II	543	109	267	53	276	55
Stage III	1,538	308	856	171	682	136
Stage IV	3,013	603	1,639	328	1,374	275
Unknown	417	83	217	43	200	40

Figure 8: Proportion of cases of lung cancer diagnosed in 2017-2021 by stage at diagnosis



Cancer stage describes the size of a cancer and how far it has grown and spread.

This information is used to help decide what treatments are needed.

The classification used here to stage cancer is the TNM classification (Version 7 prior to 2018, Version 8 from 2018 onwards).

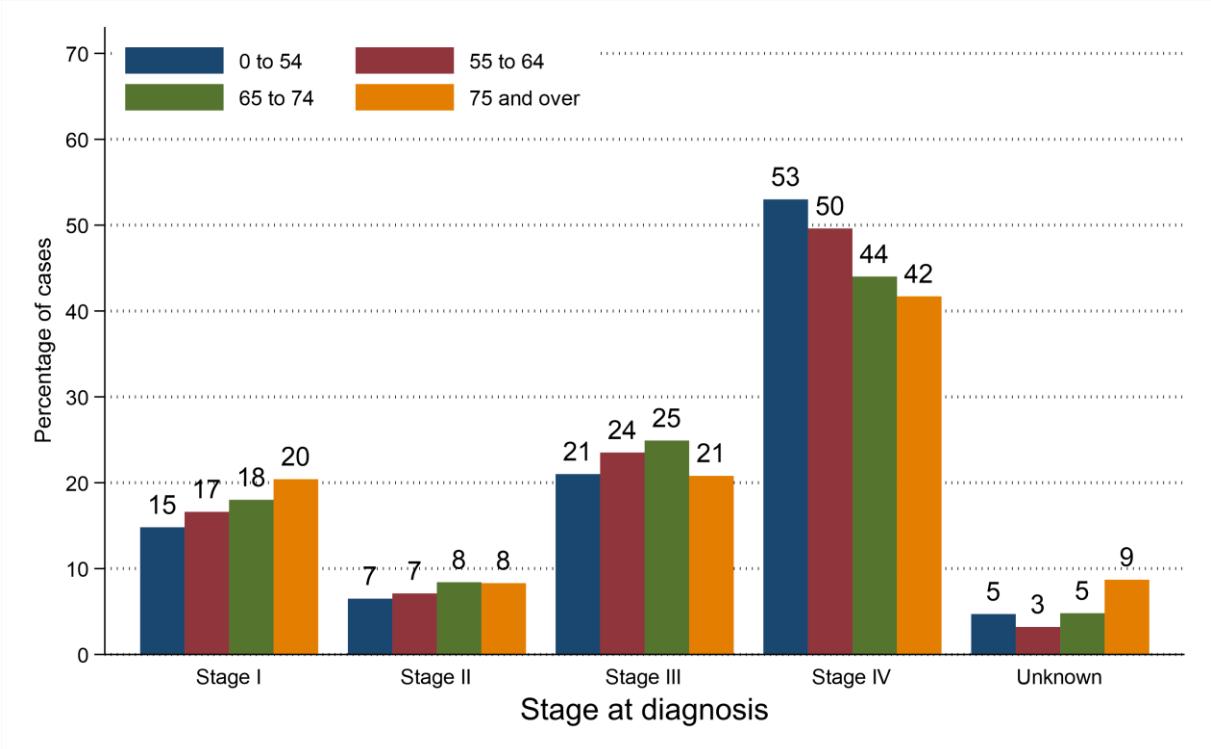
INCIDENCE BY STAGE AND AGE AT DIAGNOSIS

- During 2017-2021 91.3% of lung cancer cases among those aged 75 and over had a stage assigned compared to 95.3% of those aged 0 to 54.
- 20.4% of lung cancer cases among those aged 75 and over were diagnosed at Stage I (22.3% of staged cases) compared to 14.8% of those aged 0 to 54 (15.5% of staged cases).
- 41.7% of lung cancer cases among those aged 75 and over were diagnosed at Stage IV (45.7% of staged cases) compared to 53.0% of those aged 0 to 54 (55.6% of staged cases).

Table 3: Average number of cases of lung cancer diagnosed per year in 2017-2021 by stage and age at diagnosis

Stage at diagnosis	Age at diagnosis				
	All ages	0 to 54	55 to 64	65 to 74	75 and over
All stages	**1,354**	**77**	**235**	**470**	**571**
	.	.	.	.	.
Stage I	251	11	39	85	116
Stage II	109	5	17	39	48
Stage III	308	16	55	117	119
Stage IV	603	41	117	207	238
Unknown	83	4	8	22	50

Figure 9: Proportion of cases of lung cancer diagnosed in 2017-2021 by stage and age at diagnosis



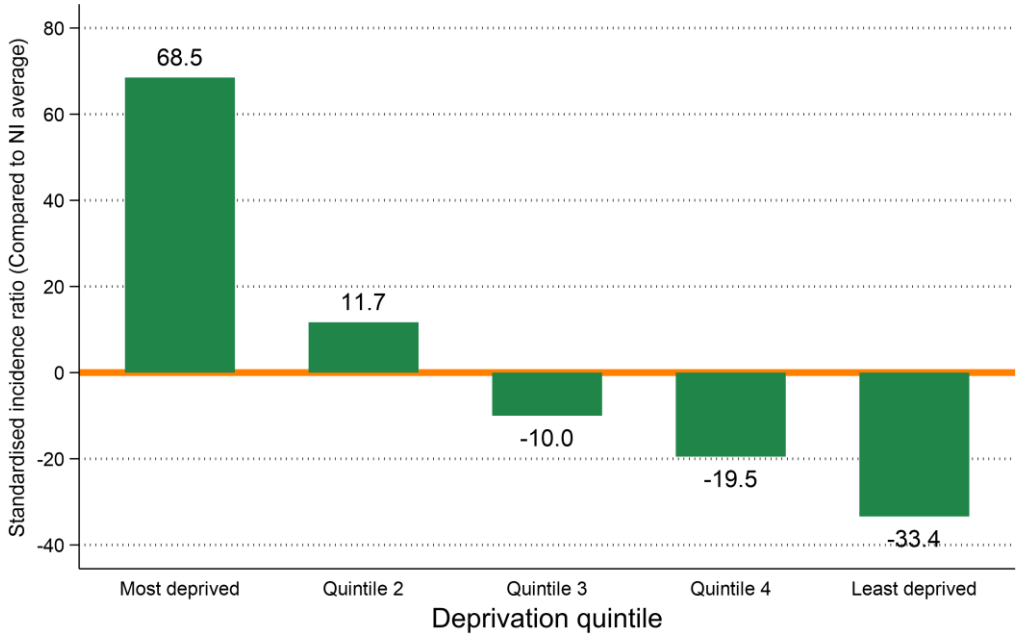
INCIDENCE BY DEPRIVATION

- The number of cases of lung cancer diagnosed during 2017-2021 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 were 68.5% higher than the NI average.
  - in the least socio-economically deprived areas were 33.4% lower than the NI average.

Table 4: Number of cases of lung cancer diagnosed in 2017-2021 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	**6,768**	**1,354**	**3,524**	**705**	**3,244**	**649**
	.	.	.	.	.	.
Most deprived	1,845	369	940	188	905	181
Quintile 2	1,512	302	796	159	716	143
Quintile 3	1,283	257	671	134	612	122
Quintile 4	1,157	231	618	124	539	108
Least deprived	970	194	498	100	472	94
Unknown	1	0	1	0	0	0

Figure 10: Standardised incidence ratio comparing deprivation quintile to Northern Ireland for lung cancer diagnosed in 2017-2021



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.

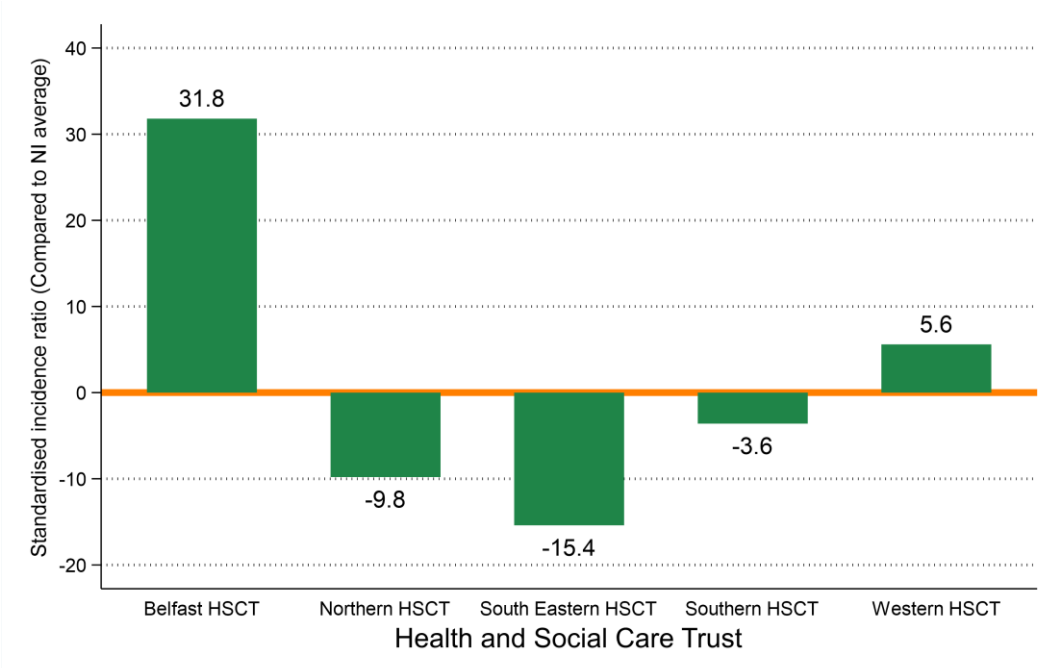
INCIDENCE BY HEALTH AND SOCIAL CARE TRUST

- The number of cases of lung cancer diagnosed during 2017-2021 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 were 31.8% higher than the NI average.
  - in Northern HSCT were 9.8% lower than the NI average.
  - in South Eastern HSCT were 15.4% lower than 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 5: Number of cases of lung cancer diagnosed in 2017-2021 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	**6,768**	**1,354**	**3,524**	**705**	**3,244**	**649**
	.	.	.	.	.	.
Belfast HSCT	1,597	319	798	160	799	160
Northern HSCT	1,632	326	830	166	802	160
South Eastern HSCT	1,223	245	637	127	586	117
Southern HSCT	1,209	242	669	134	540	108
Western HSCT	1,106	221	589	118	517	103
Unknown	1	0	1	0	0	0

Figure 11: Standardised incidence ratio comparing Health and Social Care Trust to Northern Ireland for lung cancer diagnosed in 2017-2021



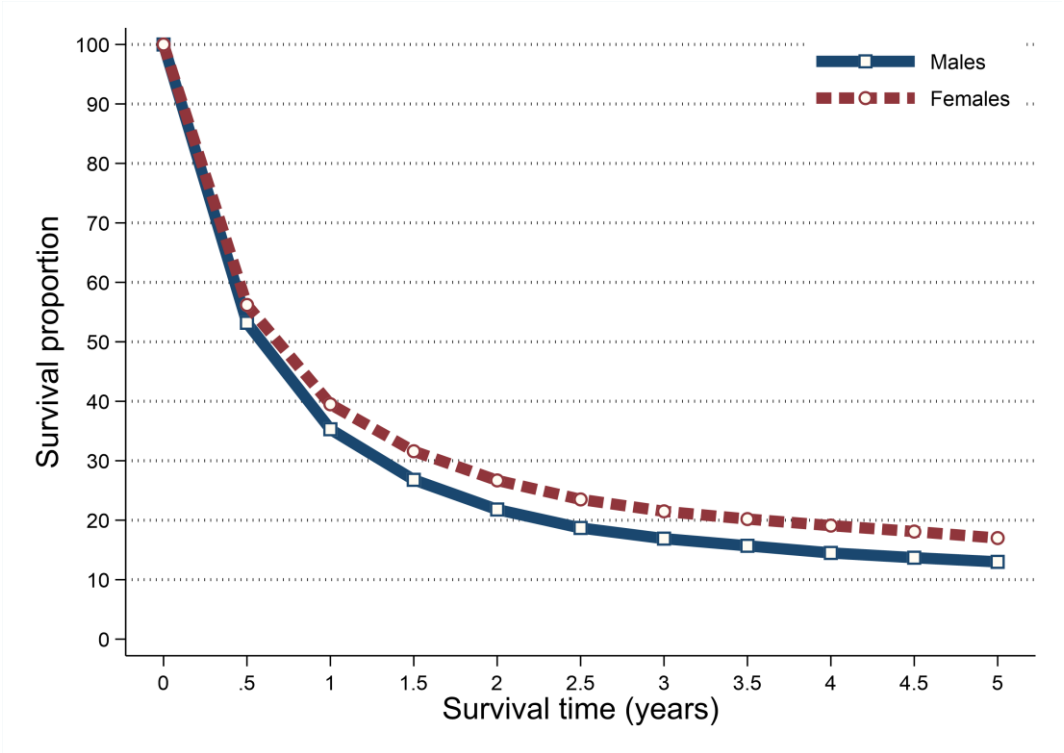
SURVIVAL

- 34.2% of patients were alive one year and 11.3% were alive five years from a lung cancer diagnosis in 2012-2016. (observed survival)
- Age-standardised net survival (ASNS), which removes the effect of deaths from causes unrelated to cancer, was 37.3% one year and 14.9% five years from a lung cancer diagnosis in 2012-2016.
- Five-year survival (ASNS) for lung cancer patients diagnosed in 2012-2016 was 13.0% among men and 17.0% among women.

Table 6: Survival from lung cancer for patients diagnosed in 2012-2016

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	51.0%	54.7%	49.9%	53.2%	52.3%	56.2%
One year	34.2%	37.3%	32.5%	35.3%	36.1%	39.5%
Two years	21.2%	24.1%	19.0%	21.8%	23.7%	26.7%
Five years	11.3%	14.9%	9.6%	13.0%	13.3%	17.0%

Figure 12: Age-standardised net survival from lung cancer for patients diagnosed in 2012-2016



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.

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.

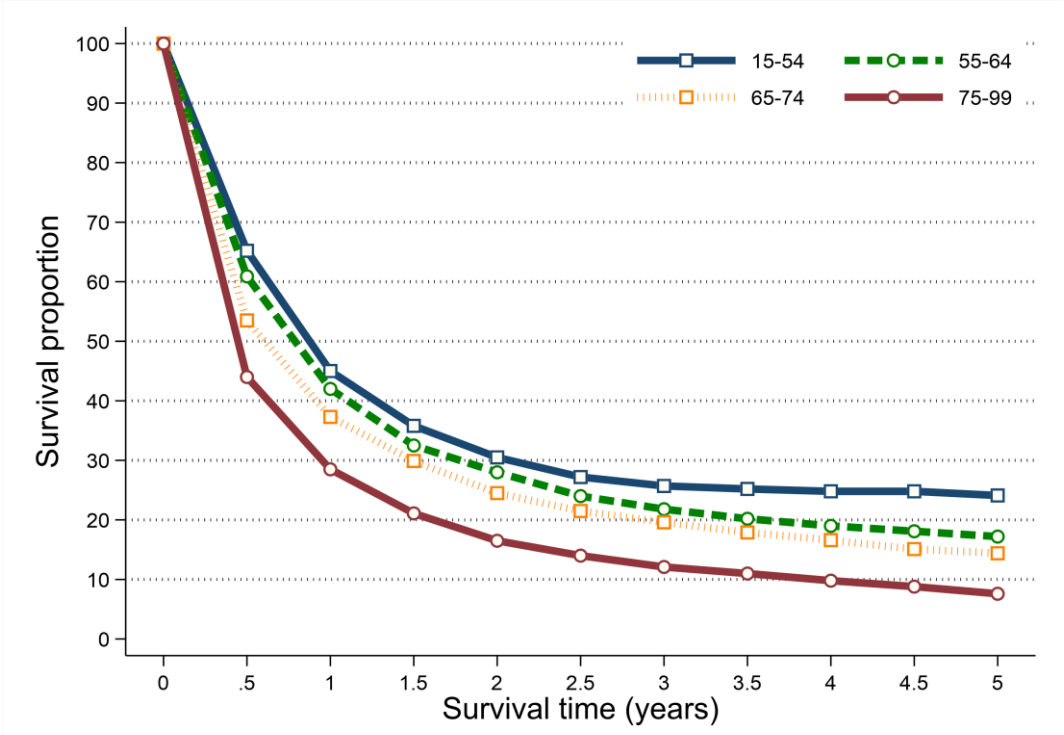
SURVIVAL BY AGE

- Survival from lung cancer among patients diagnosed during 2012-2016 was related to age with better five-year survival among younger age groups.
- Five-year net survival ranged from 24.1% among patients aged 15 to 54 at diagnosis to 7.6% among those aged 75 to 99.
- Five-year net survival for lung cancer patients aged 75 to 99 at diagnosis in 2012-2016 was 5.2% among men compared to 10.3% among women.

Table 7: Net survival from lung cancer for patients diagnosed in 2012-2016 by age at diagnosis

Age group	All persons		Male		Female	
	One-year	Five-years	One-year	Five-years	One-year	Five-years
15 to 54	45.0%	24.1%	39.9%	21.7%	50.4%	26.5%
55 to 64	42.0%	17.2%	41.8%	15.5%	42.3%	19.0%
65 to 74	37.3%	14.4%	35.8%	13.2%	39.3%	16.0%
75 to 99	28.5%	7.6%	26.6%	5.2%	30.5%	10.3%

Figure 13: Net survival from lung cancer for patients diagnosed in 2012-2016 by age at diagnosis

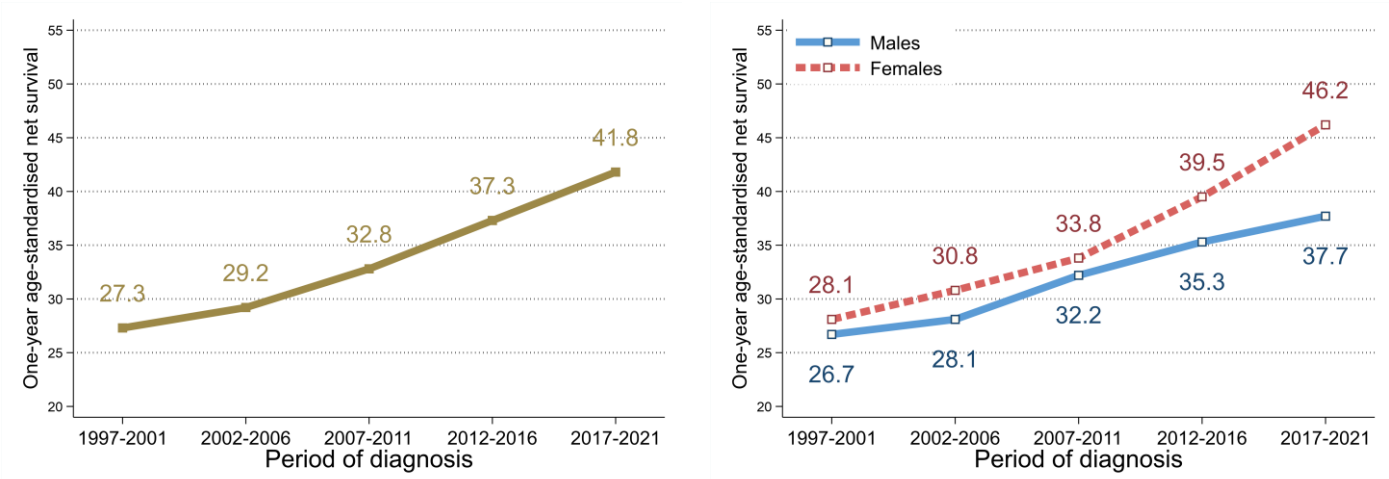


SURVIVAL TRENDS

ONE-YEAR NET SURVIVAL

- Between 2012-2016 and 2017-2021 there was a significant increase from 37.3% to 41.8% in one-year survival (ASNS) from lung cancer. This increase was significant for females (39.5% to 46.2%) but not males.
- Compared to 1997-2001 one-year survival (ASNS) from lung cancer in 2017-2021 increased significantly from 27.3% to 41.8%. This increase was significant for males (26.7% to 37.7%) and females (28.1% to 46.2%).

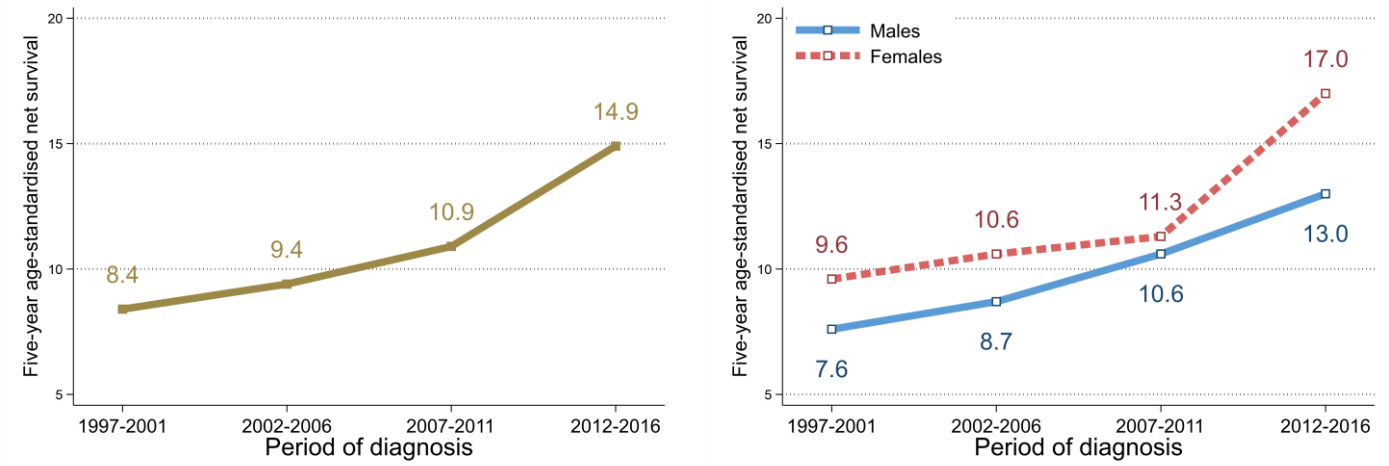
Figure 14: Trends in one-year age-standardised net survival from lung cancer in 1997-2021



FIVE-YEAR NET SURVIVAL

- Between 2007-2011 and 2012-2016 there was a significant increase from 10.9% to 14.9% in five-year survival (ASNS) from lung cancer. This increase was significant for females (11.3% to 17.0%) but not males.
- Compared to 1997-2001 five-year survival (ASNS) from lung cancer in 2012-2016 increased significantly from 8.4% to 14.9%. This increase was significant for males (7.6% to 13.0%) and females (9.6% to 17.0%).

Figure 15: Trends in five-year age-standardised net survival from lung cancer in 1997-2016



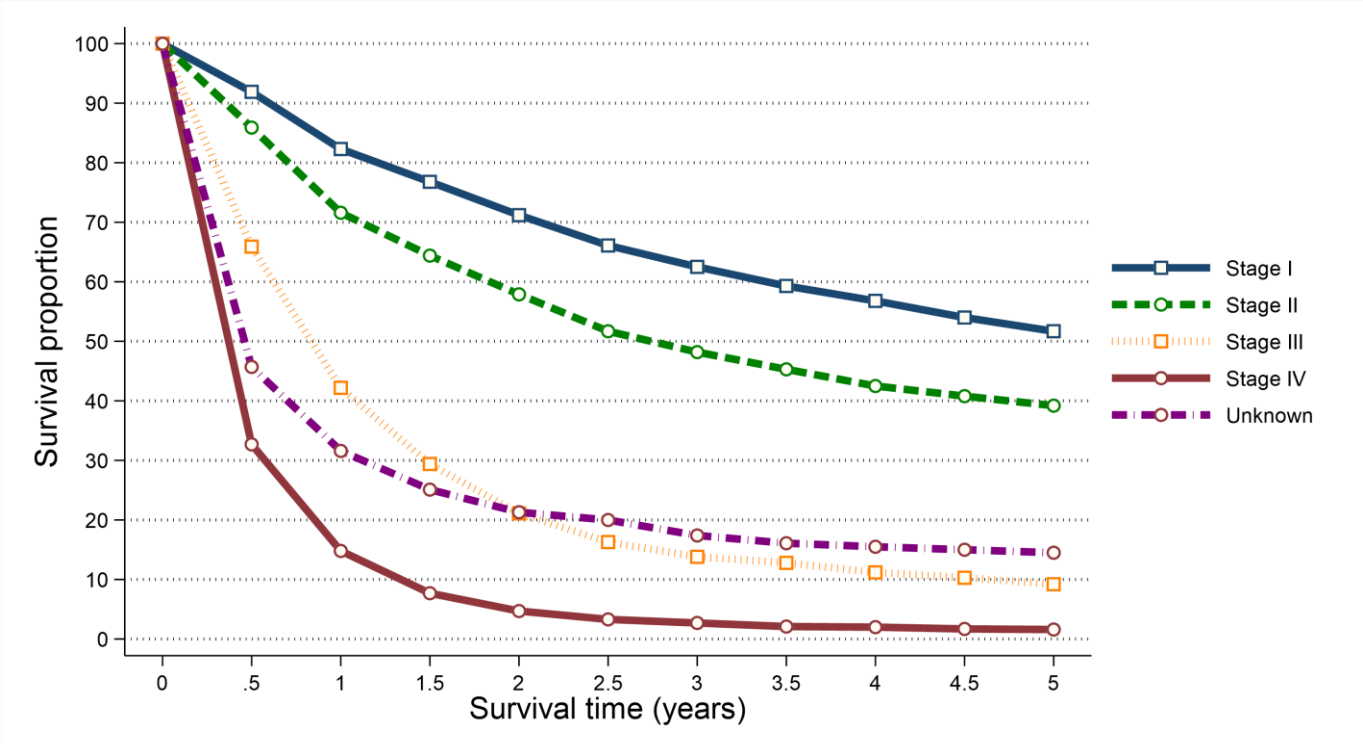
SURVIVAL BY STAGE

- Survival from lung cancer among patients diagnosed during 2012-2016 was strongly related to stage with better five-year survival among those diagnosed at earlier stages.
- Five-year survival (ASNS) ranged from 51.7% among patients diagnosed at Stage I to 1.6% among those diagnosed at Stage IV.
- Five-year survival (ASNS) for lung cancer patients diagnosed at Stage IV in 2012-2016 was 1.2% among men compared to 2.1% among women.

Table 8: Age-standardised net survival from lung cancer for patients diagnosed in 2012-2016 by stage at diagnosis

Stage at diagnosis	All persons		Male		Female	
	One-year	Five-years	One-year	Five-years	One-year	Five-years
Stage I	82.3%	51.7%	79.1%	48.1%	85.7%	54.9%
Stage II	71.6%	39.2%	67.1%	34.5%	75.6%	42.5%
Stage III	42.2%	9.2%	43.4%	7.4%	40.8%	11.2%
Stage IV	14.8%	1.6%	12.9%	1.2%	16.8%	2.1%
Unknown	31.6%	14.5%	31.1%	13.8%	32.4%	15.8%

Figure 16: Age-standardised net survival from lung cancer for patients diagnosed in 2012-2016 by stage at diagnosis



PREVALENCE

- At the end of 2021, there were 2,724 people (Males: 1,267; Females: 1,457) living with lung cancer who had been diagnosed with the disease during 1997-2021.
- Of these 26.5% had been diagnosed in the previous year (one-year prevalence) and 88.2% in the previous 10 years (ten-year prevalence).
- 41.4% of lung cancer survivors were aged 75 and over at the end of 2021.

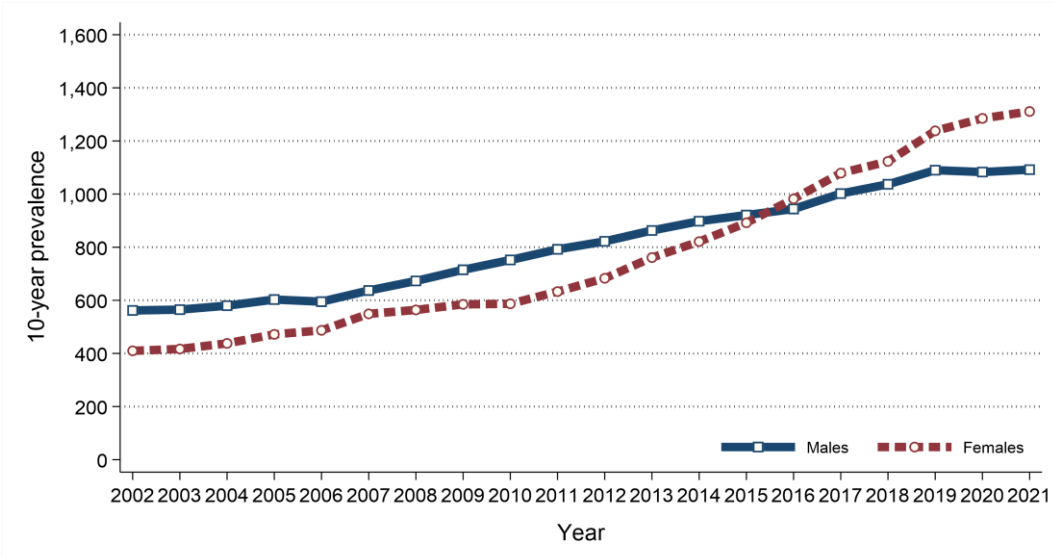
Table 9: 25-year prevalence of lung cancer by age at end of 2021

Gender	Age at end of 2021	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	2,724	722	1,137	544	321
	0 to 74	1,597	433	667	330	167
	75 and over	1,127	289	470	214	154
Male	All ages	1,267	368	487	237	175
	0 to 74	753	227	287	151	88
	75 and over	514	141	200	86	87
Female	All ages	1,457	354	650	307	146
	0 to 74	844	206	380	179	79
	75 and over	613	148	270	128	67

PREVALENCE TRENDS

- 10-year prevalence of lung cancer among males increased between 2016 and 2021 by 15.7% from 944 survivors to 1,092 survivors.
- 10-year prevalence of lung cancer among females increased between 2016 and 2021 by 33.5% from 982 survivors to 1,311 survivors.

Figure 17: Trends in 10-year prevalence of lung cancer in 2002-2021



Year	10-year prevalence	
	Males	Females
2012	822	683
2013	863	761
2014	898	821
2015	921	892
2016	944	982
2017	1,002	1,079
2018	1,037	1,123
2019	1,090	1,238
2020	1,083	1,285
2021	1,092	1,311

MORTALITY

- There were 5,167 deaths from lung cancer (including trachea) during 2017-2021 in Northern Ireland. On average this was 1,033 deaths per year.
- During this period 46.7% of lung cancer deaths were among women (Male deaths: 2,755, Female deaths: 2,412). On average there were 551 male and 482 female deaths from lung cancer per year.
- Lung cancer deaths made up 23.2% of all male cancer deaths and 22.5% of all female cancer deaths.
- The median age of patients who died from lung cancer during 2017-2021 was 74 years (Males: 74, Females: 73).
- The risk of dying from lung cancer varied by age, with 46.9% of men and 46.5% of women who died from lung cancer aged 75 and over at death.
- In contrast, 4.7% of patients who died from lung cancer were aged 0 to 54 at death.

Figure 18: Average number of deaths from lung cancer per year in 2017-2021 by age at death

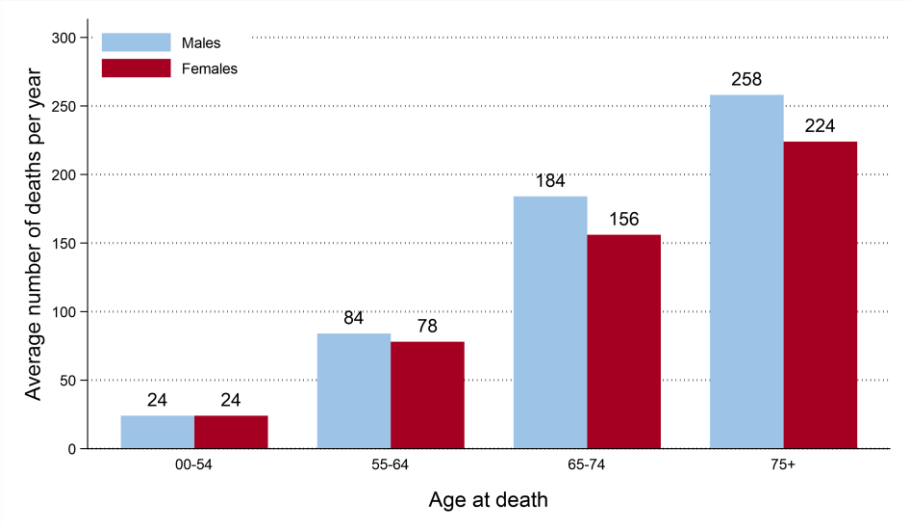
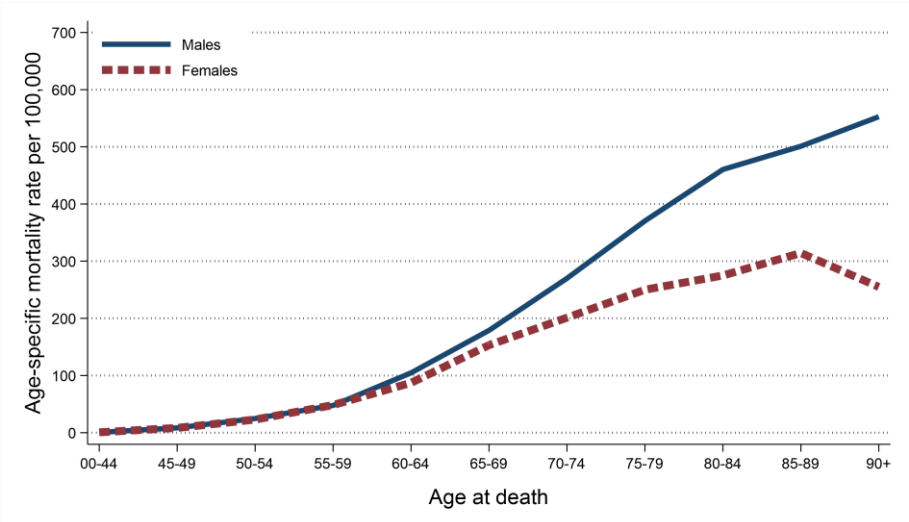


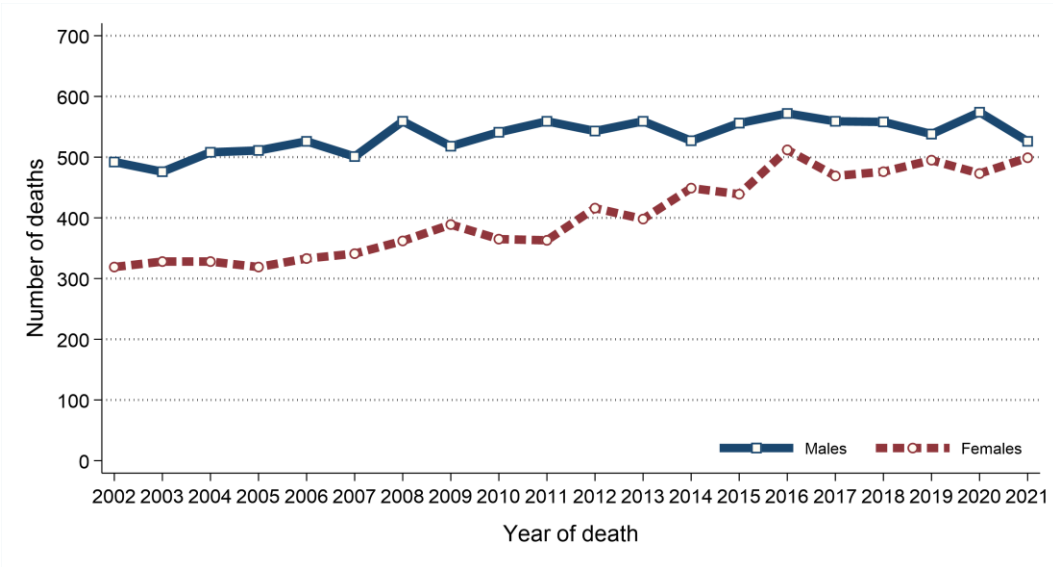
Figure 19: Age-specific mortality rates of lung cancer in 2017-2021



MORTALITY TRENDS

- The number of deaths from lung cancer among males decreased between 2012-2016 and 2017-2021 by 0.1% from 2,757 deaths (551 deaths per year) to 2,755 deaths (551 deaths per year).
- The number of deaths from lung cancer among females increased between 2012-2016 and 2017-2021 by 8.9% from 2,214 deaths (443 deaths per year) to 2,412 deaths (482 deaths per year).

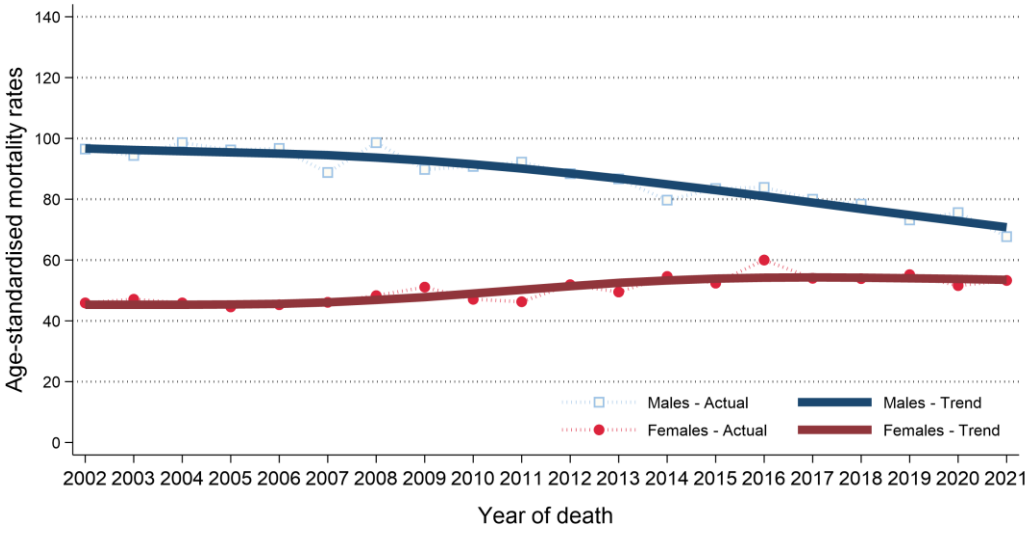
Figure 20: Trends in the number of deaths from lung cancer from 2002 to 2021



Year of death	Number of deaths	
	Males	Females
2012	543	416
2013	559	398
2014	527	449
2015	556	439
2016	572	512
2017	559	469
2018	558	476
2019	538	495
2020	574	473
2021	526	499

- Male age-standardised lung cancer mortality rates decreased between 2012-2016 and 2017-2021 by 11.3% from 84.3 to 74.8 deaths per 100,000 males. This change was statistically significant.
- Female age-standardised lung cancer mortality rates decreased between 2012-2016 and 2017-2021 by 0.4% from 53.8 to 53.6 deaths per 100,000 females. This change was not statistically significant.

Figure 21: Trends in mortality rates of lung cancer 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. lung 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. lung 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 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.