Lung cancer

Patients diagnosed 1993-2020
**(ICD10: C33-C34)**

Incidence

During 2016-2020:

▪ There were 697 male and 657 female cases of lung cancer diagnosed each year.

▪ The risk of lung cancer before the age of 75 was 1 in 23 for men and 1 in 26 for women, while before the age of 85 the risk was 1 in 11 for men and 1 in 14 for women.

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

During 2016-2020:

▪ The median age at diagnosis was 73 for men and 72 for women.

▪ Cancer risk increased with age, with 42.2% of men and 40.8% of women aged 75 years or more at diagnosis.

▪ 5.6% of cases were diagnosed among those aged under 55.

Age at diagnosis	Average cases per year		
	Male	Female	Both sexes
0 - 54	36	39	76
55 - 64	120	120	240
65 - 74	246	229	475
75 +	294	268	563
All ages	697	657	1,355
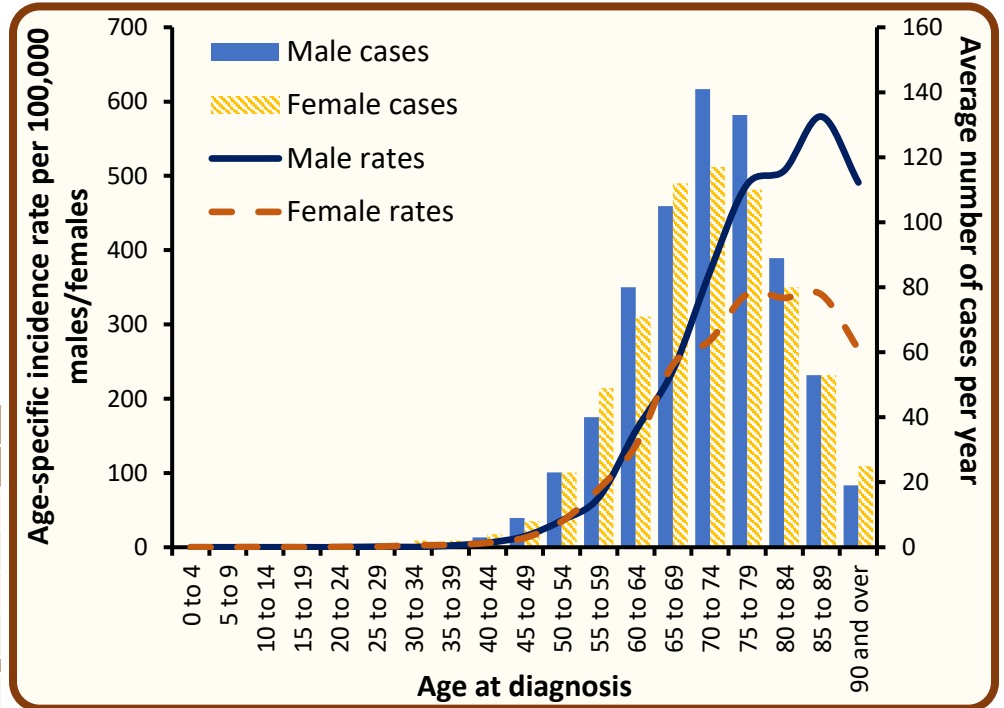
Incidence by year of diagnosis - *Lung cancer, Cases in 1996-2020*

▪ Among males the number of lung cancer increased by 3.6% from an annual average of 673 cases in 2011-2015 to 697 cases in 2016-2020.

▪ Among females the number of cases of lung cancer increased by 19.7% from an annual average of 549 cases in 2011-2015 to 657 cases in 2016-2020.

Year of diagnosis	Male	Female	Both sexes
2011	663	467	1,130
2012	658	536	1,194
2013	688	556	1,244
2014	669	591	1,260
2015	685	596	1,281
2016	670	716	1,386
2017	725	643	1,368
2018	702	618	1,320
2019	688	695	1,383
2020	701	615	1,316
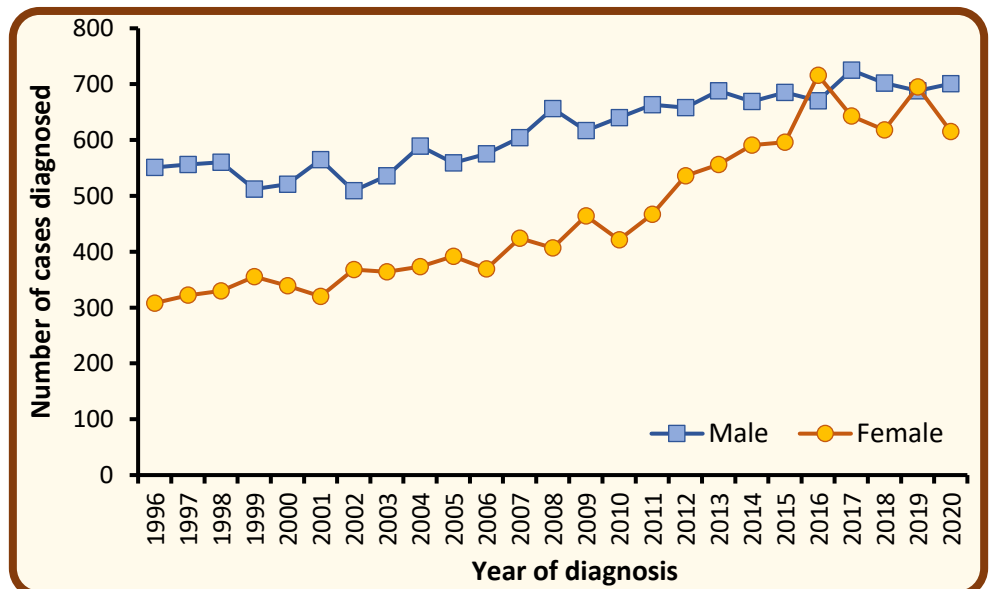
Note: Annual averages have been rounded to the nearest integer. Sums of numbers in table rows or columns may thus differ slightly from the given total.

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

▪ Among males age-standardised incidence rates of lung cancer decreased by 7.6% from 103.2 per 100,000 person years in 2011-2015 to 95.4 cases per 100,000 persons years in 2016-2020. This difference was statistically significant.

▪ Among females age-standardised incidence rates of lung cancer increased by 9.8% from 68.1 per 100,000 person years in 2011-2015 to 74.8 cases per 100,000 persons years in 2016-2020. This difference was statistically significant.
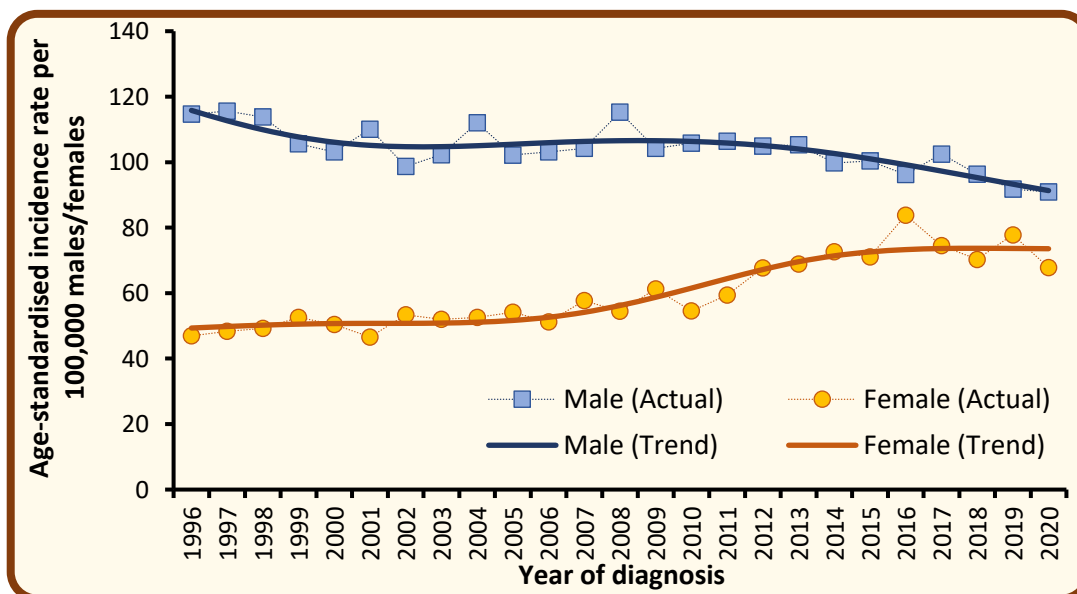
Age-standardised incidence rates illustrate the change in the number of cases within a population of a fixed size and age structure (2013 European Standard).

They thus represent changes other than those caused by population growth and/or ageing.

Trends can also be influenced by changes in how cancer is classified and coded. (e.g. the move from ICD-0-2 to ICD-0-3 in 2019).

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

For the annual average number of cases diagnosed, between 2011-2015 and 2016-2020 there was:

▪ a decrease of 4.2% among males aged 0 to 64, no change among males aged 65 to 74 and an increase of 12.2% among males aged 75 and over.

▪ an increase of 6.7% among females aged 0 to 64, an increase of 27.8% among females aged 65 to 74 and an increase of 21.7% among females aged 75 and over.

Age group	Average cases per year			
	2011-2015		2016-2020	
	Male	Female	Male	Female
0 to 64	165	149	158	159
65 to 74	245	180	245	230
75 and over	262	221	294	269
All ages	673	549	697	657

For age-standardised incidence rates, between 2011-2015 and 2016-2020 there was:

▪ no significant change among males aged 0 to 64, a decrease of 10.9% among males aged 65 to 74 and no significant change among males aged 75 and over.

▪ no significant change among females aged 0 to 64, an increase of 17.2% among females aged 65 to 74 and no significant change among females aged 75 and over.
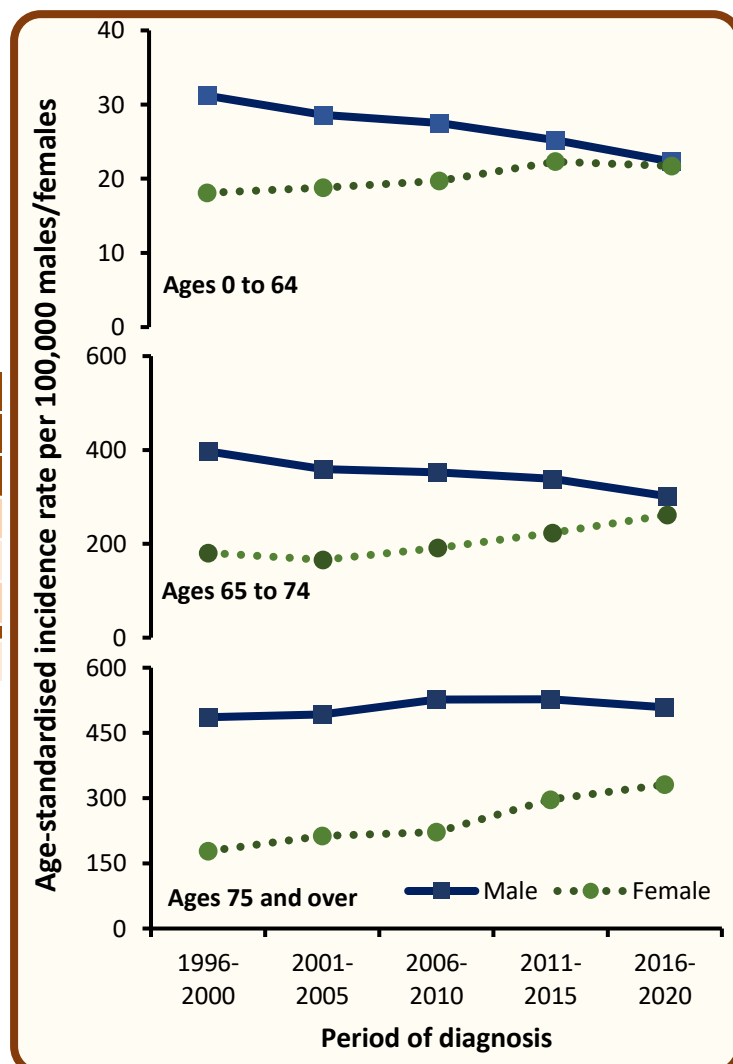
Incidence by deprivation quintile - *Lung cancer, Cases in 2016-2020*

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

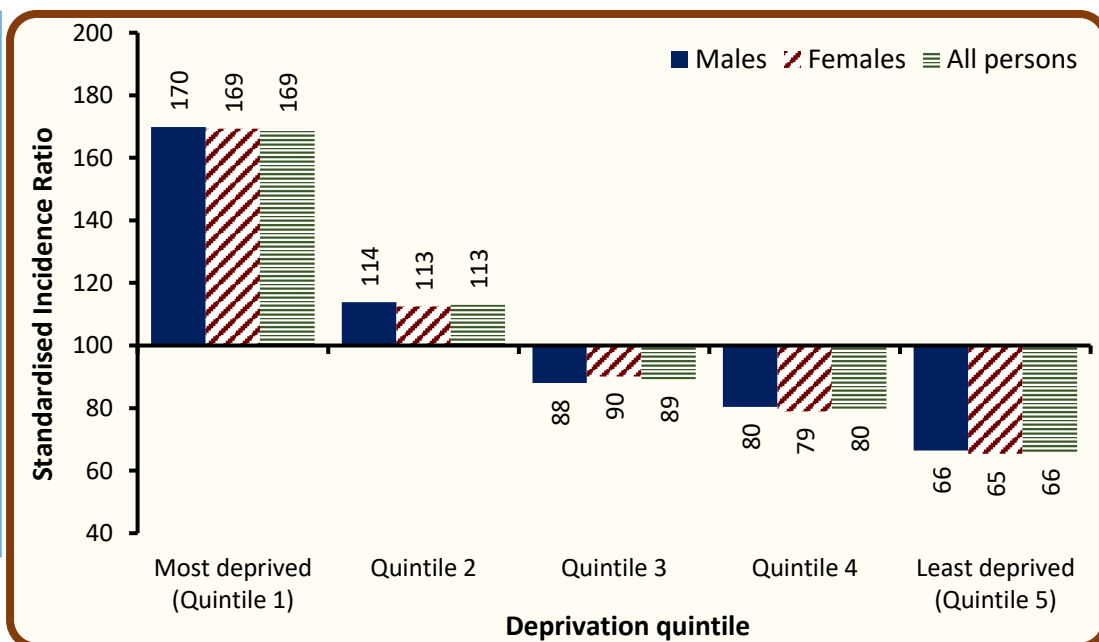After accounting for these factors, incidence rates:

▪ in the least socio-economically deprived areas were 34.1% lower than the NI average.

▪ in the most socio-economically deprived areas were 69.2% higher than the NI average.

Deprivation quintile	Average cases per year		
	Male	Female	Both sexes
Most deprived (Quintile 1)	189	184	373
Quintile 2	158	149	306
Quintile 3	131	123	254
Quintile 4	120	109	229
Least deprived (Quintile 5)	99	93	192
Northern Ireland	697	657	1,355

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

A value above 100 means that incidence rates in that deprivation quintile are greater than the Northern Ireland average.

This measure takes account of population size and age structure. Differences are thus not a result of these factors.


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

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

After accounting for these factors, incidence rates:

▪ in Belfast HSCT were significantly higher than the NI average.

▪ in Northern HSCT were significantly lower than the NI average.

▪ in South-Eastern HSCT were significantly lower than the NI average.

▪ in Southern HSCT did not vary significantly from the NI average.

▪ in Western HSCT were significantly higher than the NI average.

Health and Social Care Trust	Average cases per year		
	Male	Female	Both sexes
Belfast HSCT	161	162	323
Northern HSCT	166	167	333
South Eastern HSCT	121	114	235
Southern HSCT	133	107	240
Western HSCT	117	107	223
Northern Ireland	697	657	1,355
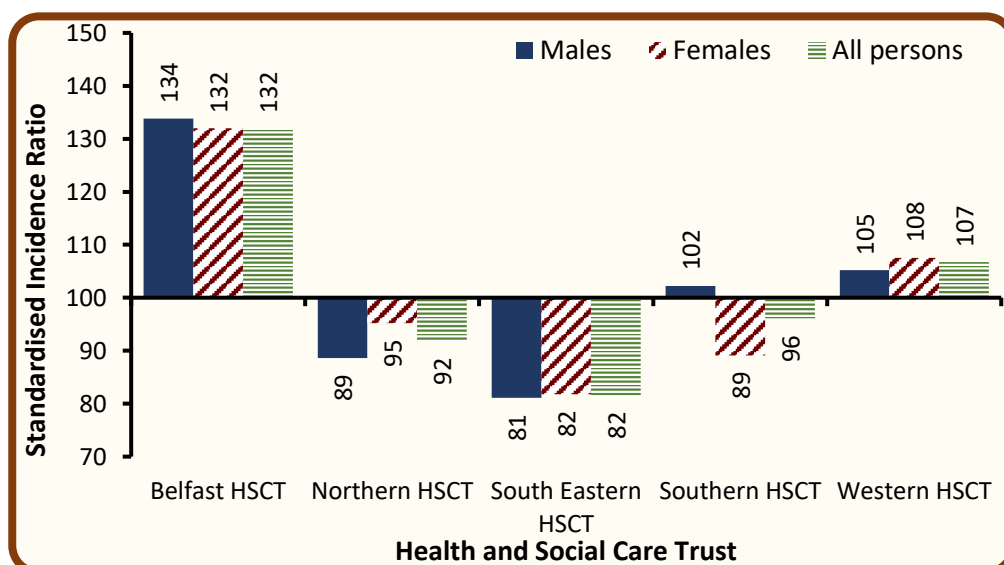
Standardised incidence ratios compare incidence rates in each HSC Trust with the Northern Ireland incidence rate. A value above 100 means that incidence rates in that HSC Trust are greater than the NI average.

This measure takes account of population size and age structure. Differences are thus not a result of these factors.

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

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

During 2016-2020:

▪ 26.5% of cases had an emergency admission to hospital recorded up to 30 days prior to cancer diagnosis.

▪ 27.2% of male cases had an emergency admission up to 30 days prior to diagnosis, compared to 25.8% of female cases.

▪ In 37.6% of diagnosed cases there was no record of a hospital inpatient admission up to 30 days prior to the diagnosis.

Method of admission	Average cases per year		
	Male	Female	Both sexes
Emergency admission	190	169	359
Elective admission	254	232	486
No emergency/elective admission recorded	254	256	510
Total	697	657	1,355
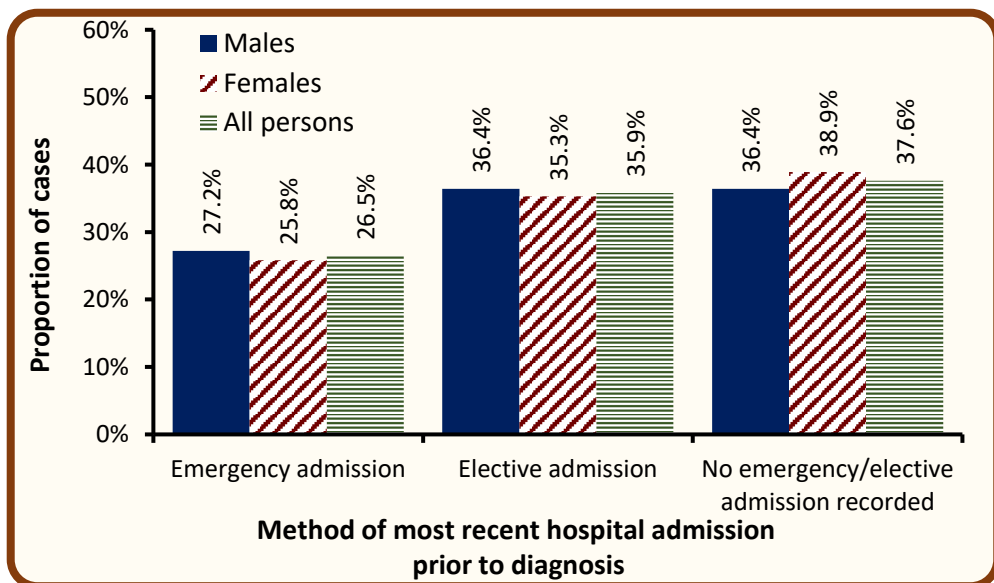
Admission method refers to the most recent hospital inpatient admission that a patient had prior to cancer diagnosis, regardless of reason for the admission.

Admissions are considered up to a maximum of 30 days prior to diagnosis. Admissions up to two days post diagnosis are also considered to allow for a reasonable margin or error in data recording.

The majority of patients with no inpatient admission recorded prior to diagnosis are likely to have been diagnosed via an outpatient route.

Incidence by stage at diagnosis - *Lung cancer, Cases in 2016-2020*

During 2016-2020:

▪ 93.9% of cases diagnosed had a stage assigned.

▪ 18.7% of cases were diagnosed at stage I. (19.9% of staged cases)

▪ 43.9% of cases were diagnosed at stage IV. (46.7% of staged cases)

▪ Among cases which were staged, 49.0% of male cases were diagnosed at stage IV, compared to 44.3% of female cases.

Stage at diagnosis	Average cases per year		
	Male	Female	Both sexes
Stage I (Early)	113	141	253
Stage II	53	56	109
Stage III	170	146	315
Stage IV (Late)	322	273	595
Unknown	40	42	82
All stages	697	657	1,355
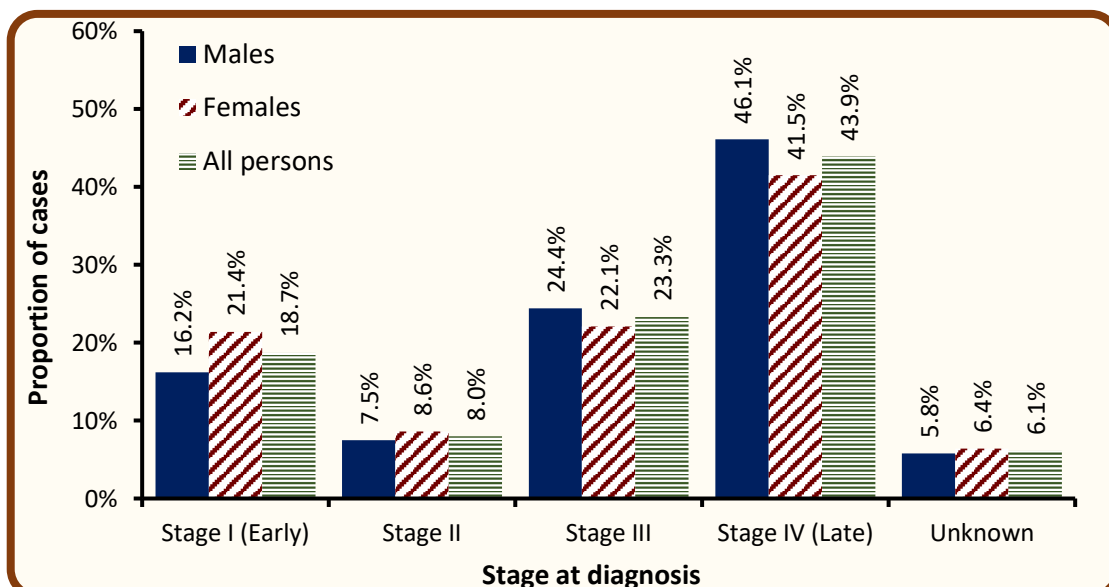
Cancer stage describes the size of a cancer and how far it has grown and spread.

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 age and stage at diagnosis - *Lung cancer, Cases in 2016-2020*

During 2016-2020:

▪ 8.9% of cases among those aged 75 and over did not have a stage assigned at diagnosis, compared to 3.7% of cases among those aged 0 to 64.

▪ Among cases which were staged, 45.1% of cases among those aged 75 and over were diagnosed at stage IV, compared to 50.8% of cases among those aged 0 to 64.

Stage at diagnosis	Average cases per year			
	0 to 64	65 to 74	75 and over	All ages
Stage I (Early)	54	85	115	253
Stage II	22	42	45	109
Stage III	74	119	122	315
Stage IV (Late)	155	208	231	595
Unknown	12	20	50	82
All stages	317	475	563	1,355
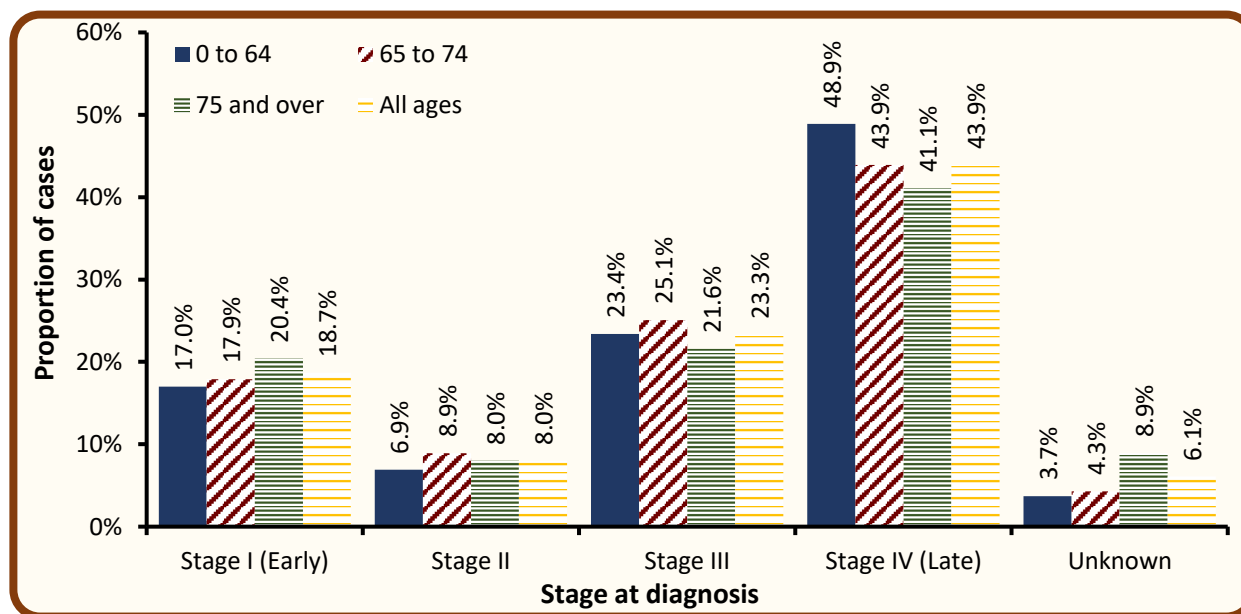
Survival

▪ 33.4% of patients were alive one year and 10.6% were alive five years from a lung cancer diagnosis in 2011-2015. (observed survival)

▪ Age-standardised net survival (ASNS), which removes the effect of deaths from causes unrelated to cancer, was 36.5% one year and 14.2% five years from a lung cancer diagnosis in 2011-2015.

▪ Five-year survival (ASNS) for lung cancer patients diagnosed in 2011-2015 was 12.2% among men and 16.7% among women.

Gender	Observed survival		Age-standardised net survival	
	One-year	Five-years	One-year	Five-years
Male	31.6%	8.9%	34.6%	12.2%
Female	35.5%	12.7%	38.8%	16.7%
Both sexes	33.4%	10.6%	36.5%	14.2%

Observed survival is the proportion of patients still alive one/five years after diagnosis. However, in this measure patients may have died from causes unrelated to their cancer.

Age-standardised net survival is the proportion of patients who would survive if the patient could not die from causes unrelated to their cancer. This measure is more typically used in studies of cancer survival.
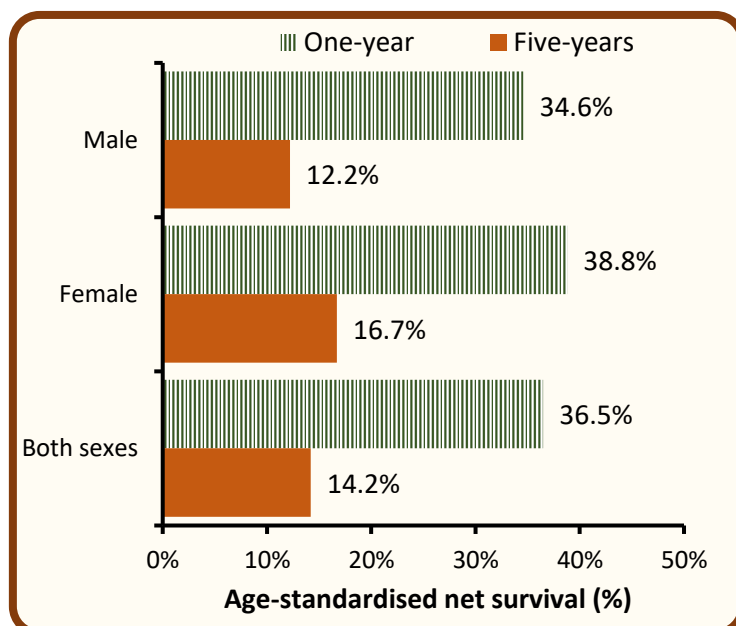
Trends in survival - *Lung cancer, Patients diagnosed in 1996-2015*

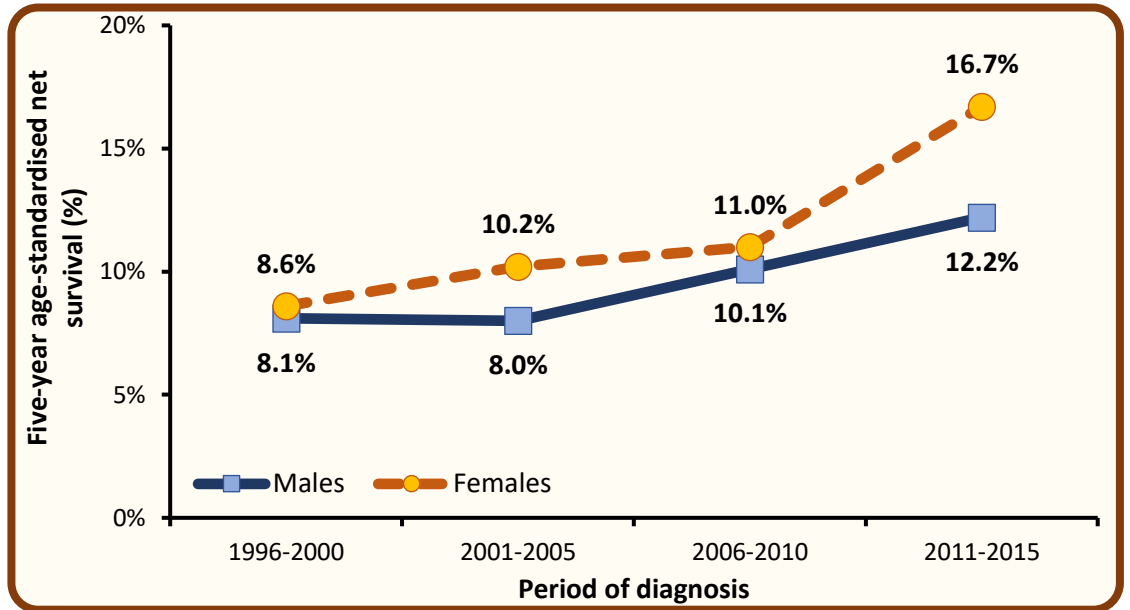▪ Among men five-year survival (ASNS) from lung cancer increased from 10.1% in 2006-2010 to 12.2% in 2011-2015. This difference was not statistically significant.

▪ Among women five-year survival (ASNS) from lung cancer increased from 11.0% in 2006-2010 to 16.7% in 2011-2015. This difference was statistically significant.
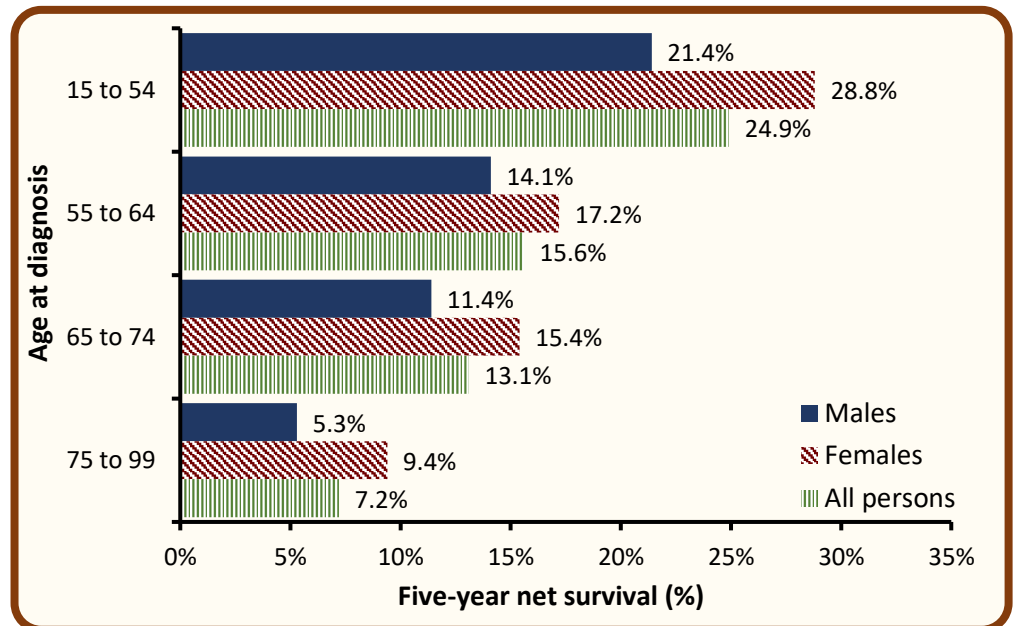
Five-year age-standardised net survival (%)

Period of diagnosis	Males	Females
1996-2000	8.1%	8.6%
2001-2005	8.0%	10.2%
2006-2010	10.1%	11.0%
2011-2015	12.2%	16.7%

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

▪ Survival from lung cancer among patients diagnosed during 2011-2015 was related to age with better five-year survival among younger age groups.

▪ Five-year net survival ranged from 24.9% among patients aged 15 to 54 at diagnosis to 7.2% among those aged 75 and over.

▪ Five-year net survival among patients aged 75 and over was 5.3% for men and 9.4% for women.

Five-year net survival (%)

Age at diagnosis	Males	Females	All persons
15 to 54	21.4%	28.8%	24.9%
55 to 64	14.1%	17.2%	15.6%
65 to 74	11.4%	15.4%	13.1%
75 to 99	5.3%	9.4%	7.2%

Survival by stage at diagnosis - *Lung cancer, Patients diagnosed in 2011-2015*

▪ Stage at diagnosis is one of the most important factors in lung cancer survival with five-year survival decreasing as stage increases.

▪ Five-year survival (ASNS) ranged from 50.0% for early stage (stage I) disease to 1.4% for late stage (stage IV) disease.

▪ Five-year survival (ASNS) for unstaged cancer was 15.9%.

▪ Five-year survival (ASNS) for stage IV cancer was 0.7% for men, compared to 2.4% for women.

Five-year age-standardised net survival (%)

Stage at diagnosis	Males	Females	All persons
Stage I (Early)	47.4%	52.7%	50.0%
Stage II	32.0%	41.7%	36.5%
Stage III	7.9%	11.2%	9.4%
Stage IV (Late)	0.7%	2.4%	1.4%
Unknown	12.7%	20.2%	15.9%
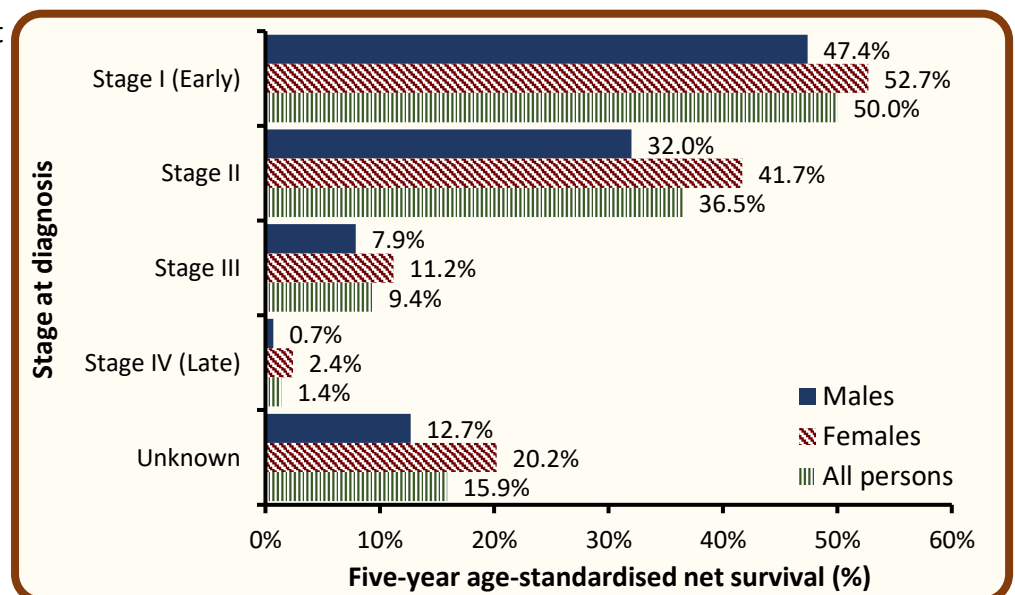
Survival by method of most recent admission to hospital *- Lung cancer, Patients diagnosed in 2011-2015*

▪ Five-year survival (ASNS) among patients who had an emergency admission to hospital within 30 days prior to their cancer diagnosis was 1.9% compared to 21.6% among those with elective admissions and 14.4% among those who had no hospital admissions recorded within 30 days prior to diagnosis.

▪ Five-year survival (ASNS) among patients who had an emergency admission to hospital within 30 days prior to their cancer diagnosis was 1.2% for men, compared to 2.6% for women.

Method of admission to hospital

Emergency admission	Males 1.2%, Females 2.6%, All persons 1.9%
Elective admission	Males 17.6%, Females 26.8%, All persons 21.6%
No emergency/elective admission recorded	Males 13.2%, Females 15.9%, All persons 14.4%

■ Males
▨ Females
▥ All persons

Five-year age-standardised net survival (%)
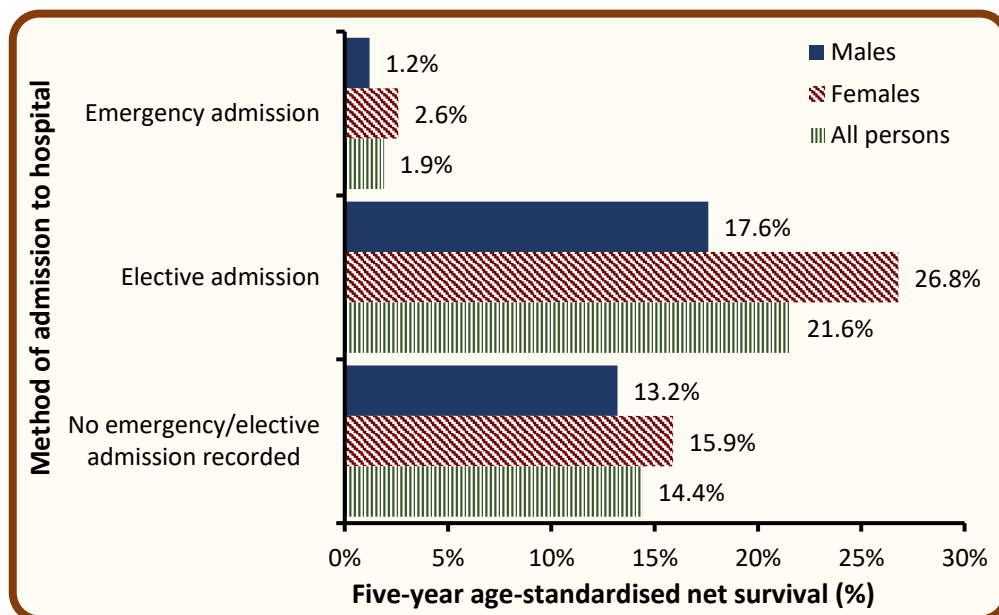
Prevalence

▪ At the end of 2020, there were 2,627 people (Males: 1,234; Females: 1,393) living with lung cancer who had been diagnosed with the disease during 1996-2020.

▪ Of these, 47.0% were male, 40.4% were aged 75 and over, and 27.1% had been diagnosed in the previous year.

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

| Time since diagnosis | 25-year prevalence | | | | | | | | |
| | Aged 0-74 | | | Aged 75+ | | | All ages | | |
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
0-1 year	213	218	431	142	140	282	355	358	713
1-5 years	297	395	692	190	241	431	487	636	1,123
5-10 years	131	160	291	88	103	191	219	263	482
10-25 years	87	65	152	86	71	157	173	136	309
0-25 years	728	838	1,566	506	555	1,061	1,234	1,393	2,627

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

▪ Among males the number of survivors from lung cancer who had been diagnosed within the previous ten years (10-year prevalence) increased by 15.3% from 920 survivors in 2015 to 1,061 survivors in 2020.

▪ Among females the number of survivors from lung cancer who had been diagnosed within the previous ten years (10-year prevalence) increased by 40.9% from 892 survivors in 2015 to 1,257 survivors in 2020.

| Year | 10-year prevalence | | |
	Male	Female	Both sexes
2011	791	632	1,423
2012	821	682	1,503
2013	861	761	1,622
2014	896	821	1,717
2015	920	892	1,812
2016	943	982	1,925
2017	1,001	1,077	2,078
2018	1,034	1,119	2,153
2019	1,083	1,226	2,309
2020	1,061	1,257	2,318

Mortality

- During 2016-2020 there were 560 male and 485 female deaths from lung cancer each year.

- Lung cancer made up 24.0% of all male, and 22.8% of all female cancer deaths (ex NMSC).

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

- The median age at death during 2016-2020 was 74 for men and 73 for women.

- Risk of death from lung cancer was strongly related to patient age, with 46.3% of men and 46.0% of women aged 75 years or more at time of death.

- 4.7% of lung cancer deaths occurred among those aged under 55.

| Age at death	Average deaths per year		
	Male	**Female**	**Both sexes**
0 - 54	25	24	49
54 - 64	88	81	168
65 - 74	187	157	345
75 +	259	223	483
All ages	560	485	1,045

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

- Among males the number of deaths from lung cancer increased by 2.0% from an annual average of 549 deaths in 2011-2015 to 560 deaths in 2016-2020.

- Among females the number of deaths from lung cancer increased by 17.4% from an annual average of 413 deaths in 2011-2015 to 485 deaths in 2016-2020.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Male	559	543	559	527	556	572	559	558	538	573
Female	363	416	398	449	439	512	469	476	495	471
Both sexes	922	959	957	976	995	1,084	1,028	1,034	1,033	1,044

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

- Among males age-standardised mortality rates from lung cancer decreased by 9.1% between 2011-2015 and 2016-2020 from 85.9 to 78.1 deaths per 100,000 persons years. This difference was statistically significant.

- Among females age-standardised mortality rates from lung cancer increased by 7.6% between 2011-2015 and 2016-2020 from 51.0 to 54.9 deaths per 100,000 persons years. This difference was not statistically significant.
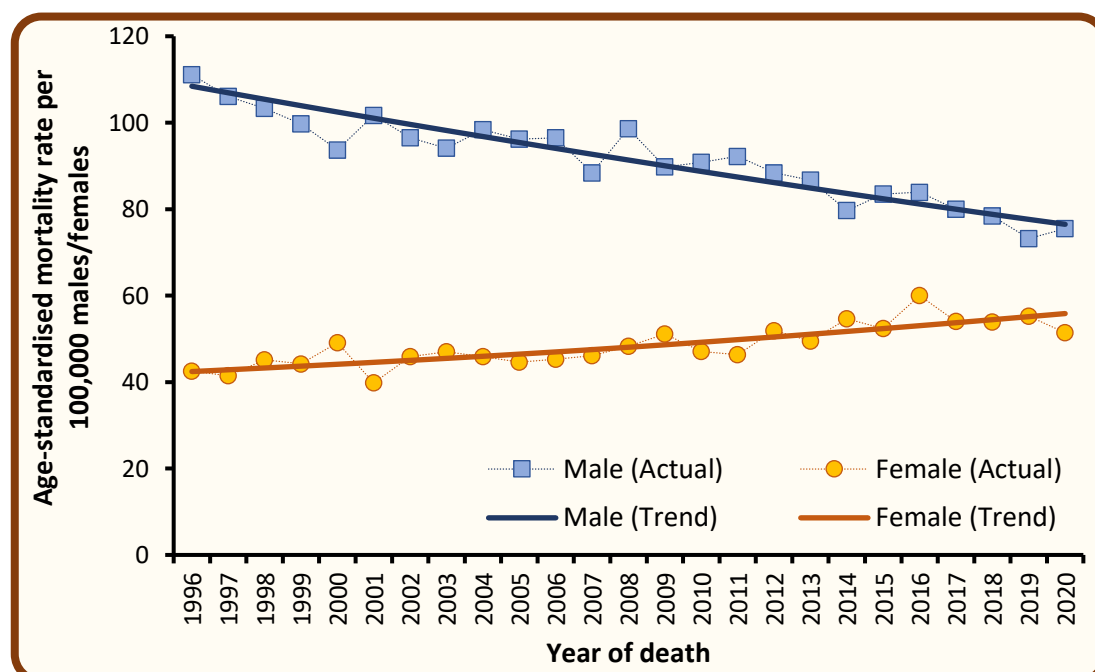
Mortality data are provided by the Northern Ireland General Registrar Office via the Department of Health.

Counts of the number of deaths are based upon the year that death occurred, and upon the primary cause of death only.

Age-standardised mortality rates remove changes over time caused by population growth and/or ageing.

Background notes

Cancer classification: Classification of tumour sites is carried out using ICD10 codes. For a listing and explanation of ICD10 codes see: World Health Organisation at http://apps.who.int/classifications/icd10/browse/2010/en#/II

Population data for Northern Ireland, and smaller geographic areas, are extracted from the NI mid-year population estimates available from the NI Statistics and Research Agency (available at www.nisra.gov.uk).

Geographic areas are assigned based on a patient's postcode of usual residence at diagnosis using the Jan 2021 Central Postcode Directory (CPD) produced by the NI Statistics and Research Agency (available at www.nisra.gov.uk).

Deprivation quintiles: Super output areas (SOA) are assigned to each patient based on their postcode of usual residence at diagnosis. Using the SOA each patient is assigned a socio-economic deprivation quintile based on the 2017 Multiple Deprivation Measure. The 2017 Multiple Deprivation Measure is available from the NI Statistics and Research Agency (available at www.nisra.gov.uk).

A **crude incidence/mortality rate** is the number of cases/deaths per 100,000 person years in the population. Person years are the sum of the population over the number of years included.

An **age-standardised incidence/mortality rate** per 100,000 person years is an estimate of the incidence/mortality rate if that population had a standard age structure. Throughout this report the 2013 European Standard Population has been used. Standardising to a common Standard Population allows comparisons of incidence/mortality rates to be made between different time periods and geographic areas while removing the effects of population change and ageing.

A **Standardised Incidence/Mortality Ratio (SIR/SMR)** is the ratio of the number of cases/deaths observed in a population to the expected number of cases/deaths, based upon the age-specific rates in a reference population. This statistic is often used to compare incidence/mortality rates for geographic areas (e.g. Trusts) to the national incidence/mortality rates (i.e. Northern Ireland). An SIR/SMR of 100 indicates there is no difference between the geographic area and the national average.

Confidence intervals are a measure of the precision of a statistic (e.g. 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. cervical cancer incidence rate in year 2012 vs year 2013), if the confidence interval around one statistic overlaps with the interval around another, it is unlikely that there is any real difference between the two. If there is no overlap, the difference is considered to be **statistically significant**.

Lifetime risk is estimated as the cumulative risk of getting cancer up to age 75/85, calculated directly from the age-specific incidence rates. The odds of developing the disease before age 75/85 is the inverse of the cumulative risk.

Prevalence is the number of cancer patients who are alive in the population on a specific date (31st December 2020 in this report). Since data from the NI Cancer Registry are only available since 1993, prevalence only refers to a fixed term (10 and 25 years in this report). There may be members of the population living with a diagnosis of cancer for more than 25 years.

Observed survival refers to the proportion of patients who survive a specified amount of time from their date of diagnosis. Observed survival considers death from any cause and is not adjusted for the age of the patient. Cause of death may be unrelated to the cancer the patient has been diagnosed with.

Net Survival is an estimate of survival where the effect on survival of background population mortality rates has been removed. It represents the [theoretical] survival of cancer patients if they could only die from cancer-related causes. Age-standardised net survival estimates are the estimates that would occur if that population of cancer patients had a standard population age structure. The age groups and weights used here are those used by international studies such as EUROCARE, an international study group that compares cancer survival among European countries. However, due to the small number of patients in NI, the first two age categories in the standard population are combined.

Mortality: Information relating to cancer mortality is sourced from the General Registrar Office (GRONI) via the Department of Health (NI). Results are based upon the date on which death occurs, and may thus differ slightly than those produced by the Northern Ireland Statistics and Research Agency (NISRA), which produces deaths data based upon the date on which the death is registered with GRONI.