Rectal cancer

Patients diagnosed 1993-2019
**(ICD10: C19-C20)**

Incidence

During 2015-2019:

▪ There were 234 male and 142 female cases of rectal cancer diagnosed each year.

▪ Rectal cancer made up 4.7% of all male cancers (ex NMSC), and 2.9% of all female cancers (ex NMSC).

▪ The risk of rectal cancer before the age of 75 was 1 in 60.1 for men and 1 in 112.7 for women, while before the age of 85 the risk was 1 in 32.7 for men and 1 in 67.0 for women.

Incidence by age at diagnosis - *Rectal cancer, Cases in 2015-2019*

During 2015-2019:

▪ The median age at diagnosis was 69 for men and 69 for women.

▪ Cancer risk increased with age, with 32.9% of men and 34.5% of women aged 75 years or more at diagnosis.

▪ 14.9% of cases were diagnosed among those aged under 55.

Age at diagnosis	Average cases per year		
	Male	Female	Both sexes
0 - 54	32	26	56
55 - 64	53	35	88
65 - 74	72	34	106
75 +	77	49	126
All ages	234	142	376
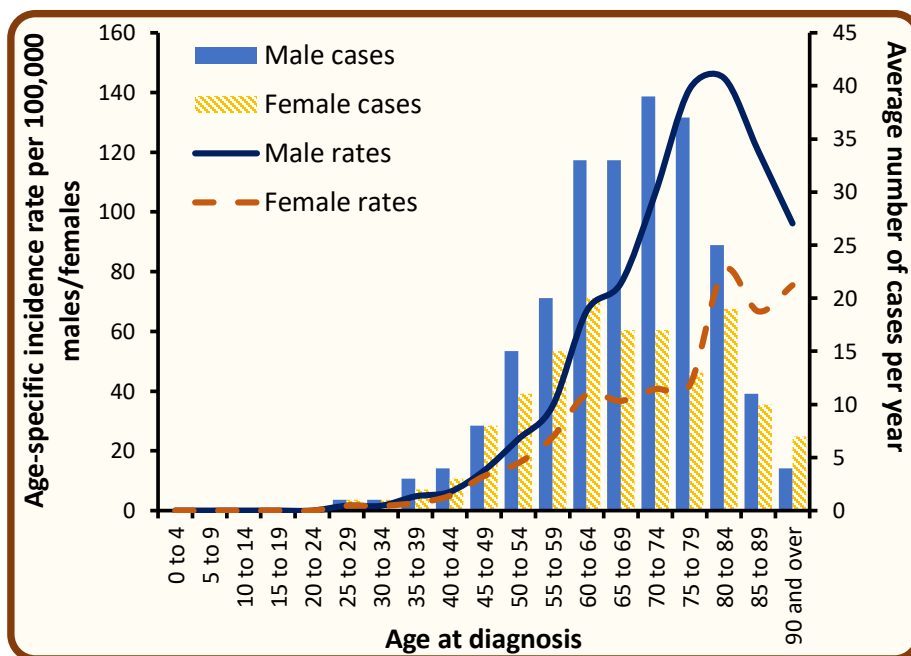
Incidence by year of diagnosis - *Rectal cancer, Cases in 1995-2019*

▪ Among males the number of rectal cancer decreased by 1.7% from an annual average of 238 cases in 2010-2014 to 234 cases in 2015-2019.

▪ Among females the number of cases of rectal cancer decreased by 4.7% from an annual average of 149 cases in 2010-2014 to 142 cases in 2015-2019.

| Year of diagnosis	Male	Female	Both sexes
2010	231	142	373
2011	250	159	409
2012	267	159	426
2013	220	153	373
2014	220	131	351
2015	224	131	355
2016	231	133	364
2017	238	137	375
2018	220	160	380
2019	259	148	407
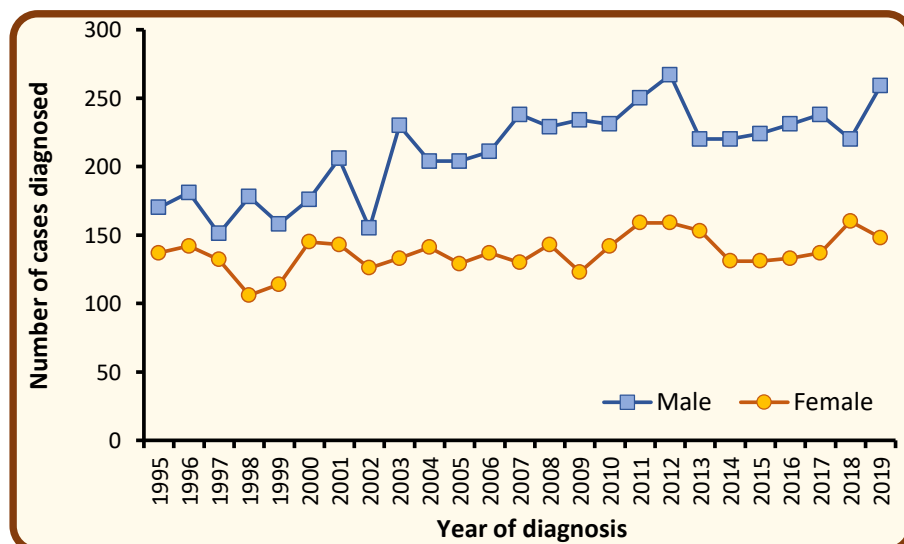
Note: Annual averages have been rounded to the nearest integer. Sums of numbers in table rows or columns may thus differ slightly from the given total.

NMSC: Non-melanoma skin cancer

Trends in age-standardised incidence rates - *Rectal cancer, Cases in 1995-2019*

▪ Among males age-standardised incidence rates of rectal cancer decreased by 10.8% from 35.2 per 100,000 person years in 2010-2014 to 31.4 cases per 100,000 persons years in 2015-2019. This difference was statistically significant.

▪ Among females age-standardised incidence rates of rectal cancer decreased by 13.0% from 18.4 per 100,000 person years in 2010-2014 to 16.0 cases per 100,000 persons years in 2015-2019. This difference was not statistically significant.
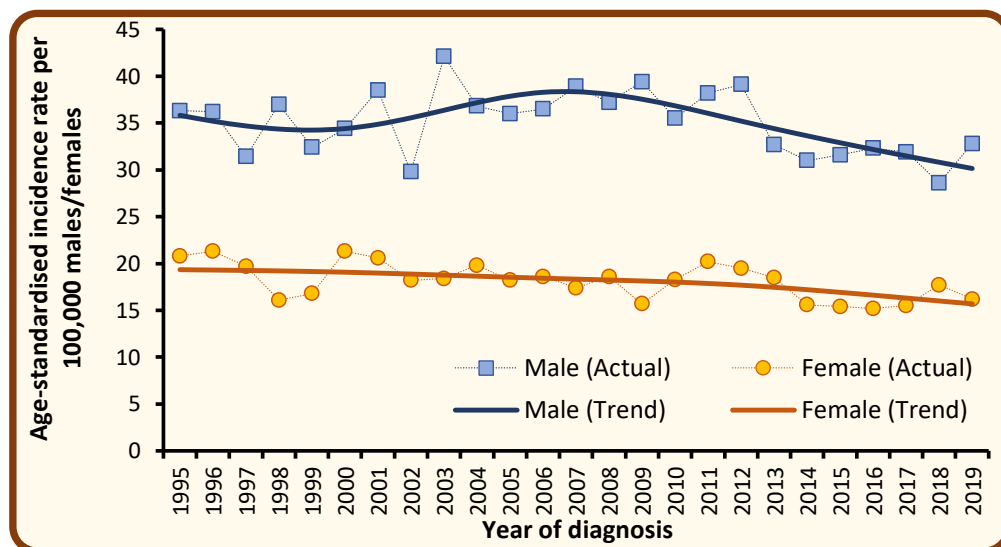
Age-standardised incidence rates illustrate the change in the number of cases within a population of a fixed size and age structure (2013 European Standard).

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 - *Rectal cancer, Cases in 1995-2019*

For the annual average number of cases diagnosed, between 2010-2014 and 2015-2019 there was:
▪ a decrease of 6.5% among males aged 0 to 64, a decrease of 7.6% among males aged 65 to 74 and an increase of 13.4% among males aged 75 and over.
▪ an increase of 15.7% among females aged 0 to 64, a decrease of 19.0% among females aged 65 to 74 and a decrease of 12.5% among females aged 75 and over.

| Age group | Average cases per year | | | |
| | 2010-2014 | | 2015-2019 | |
	Male	Female	Male	Female
0 to 64	92	51	86	59
65 to 74	79	42	73	34
75 and over	67	56	76	49
All ages	238	149	234	142

For age-standardised incidence rates, between 2010-2014 and 2015-2019 there was:
▪ no significant change among males aged 0 to 64, a decrease of 18.7% 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, a decrease of 26.9% among females aged 65 to 74 and no significant change among females aged 75 and over.
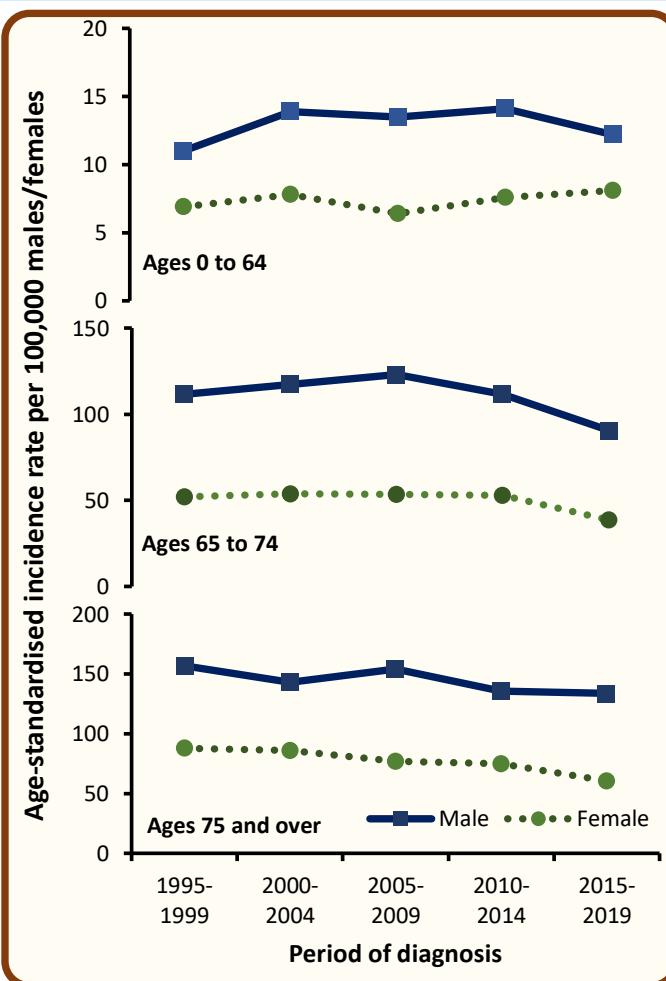
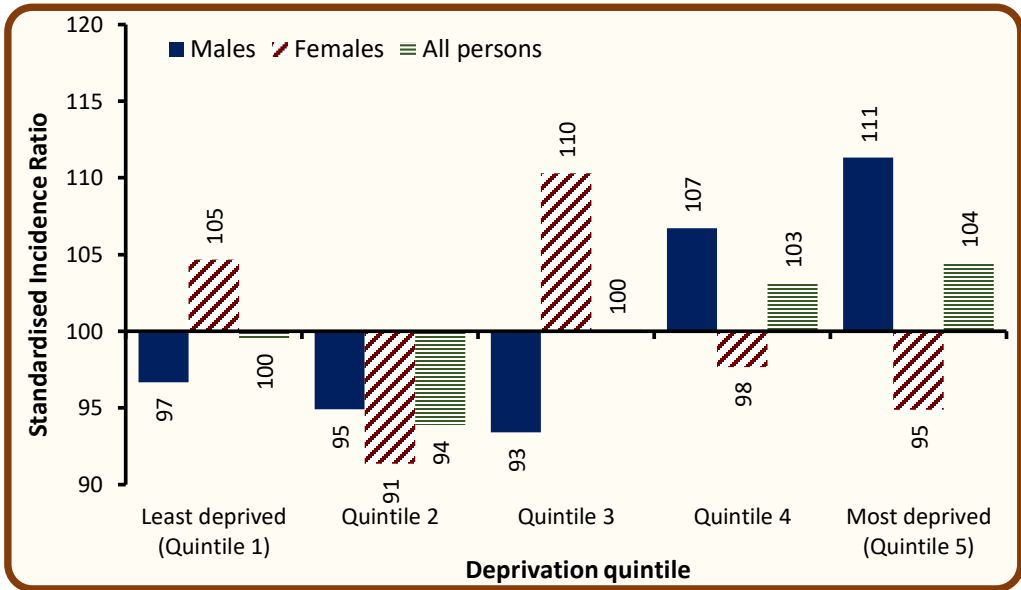## Incidence by deprivation quintile - *Rectal cancer, Cases in 2015-2019*

The annual number of cases during 2015-2019 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.

Deprivation quintile	Average cases per year		
	Male	Female	Both sexes
Least deprived (Quintile 1)	48	32	79
Quintile 2	48	27	75
Quintile 3	47	32	79
Quintile 4	50	28	78
Most deprived (Quintile 5)	43	23	65
Northern Ireland	234	142	376

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) - *Rectal cancer, Cases in 2015-2019*

The annual number of cases during 2015-2019 varied in each HSCT 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.

Health and Social Care Trust	Average cases per year		
	Male	Female	Both sexes
Belfast HSCT	39	27	66
Northern HSCT	57	37	94
South-Eastern HSCT	47	32	80
Southern HSCT	50	24	75
Western HSCT	40	21	62
Northern Ireland	234	142	376
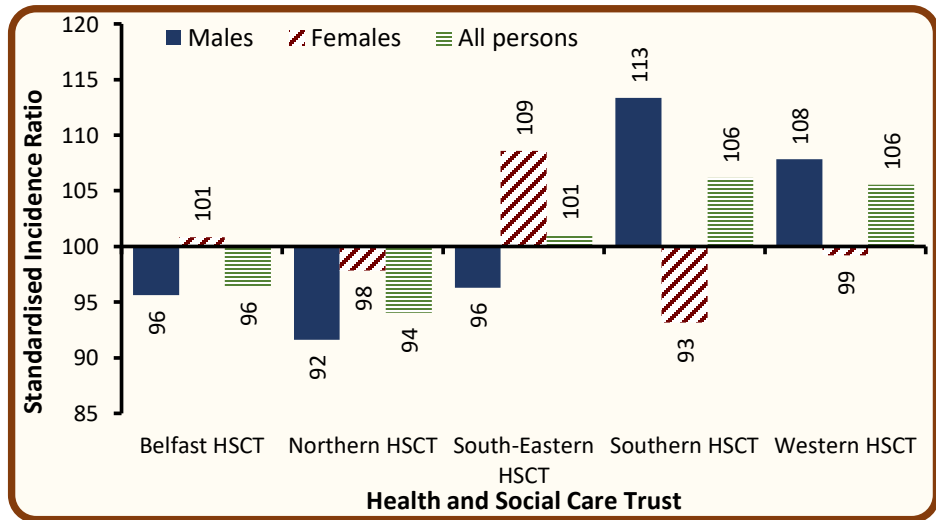
Standardised incidence ratios compare incidence rates in each HSC Trust with the Northern Ireland incidence rate. A value above 100 means that incidence rates in that HSC Trust are greater than the NI average.

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 - *Rectal cancer, Cases in 2015-2019*

During 2015-2019:

▪ 9.9% of cases had an emergency admission to hospital recorded up to 30 days prior to cancer diagnosis.

▪ 8.5% of male cases had an emergency admission up to 30 days prior to diagnosis, compared to 12.3% of female cases.

▪ In 16.2% 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	20	17	37
Elective admission	180	97	278
No emergency/elective admission recorded	34	27	61
Total	234	142	376
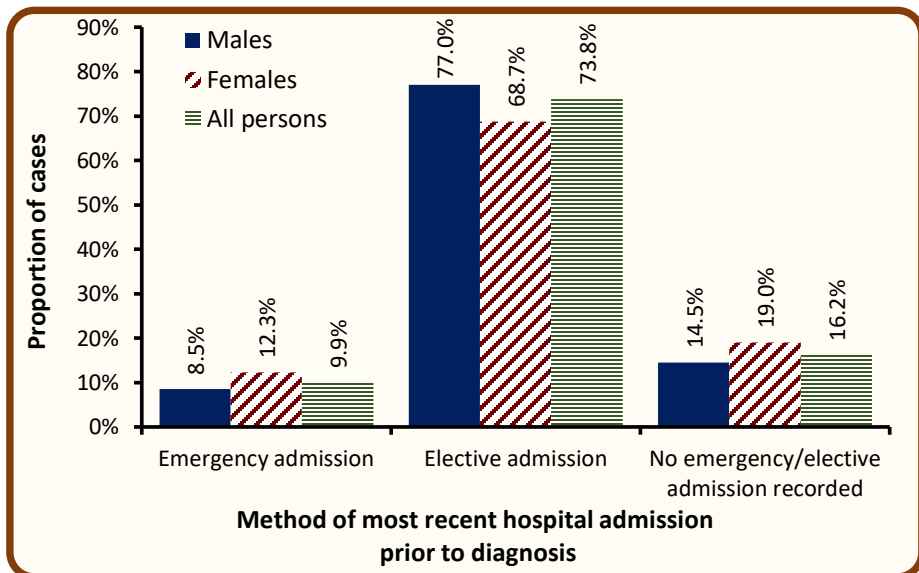
Admission method refers to the most recent hospital inpatient admission that a patient had prior to cancer diagnosis, regardless of reason for the admission.

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 screen detection of cancer - *Rectal cancer, Ages 60 to 74, Cases in 2015-2019*

During 2015-2019:

▪ 25.8% of cases diagnosed among those aged 60 to 74 were detected by bowel cancer screening.

▪ 27.8% of cases among males aged 60 to 74 were screen detected, compared to 21.8% of cases among females in the same age group.

Screen detected	Average cases per year		
	Male	Female	Both sexes
Not screen detected	76	42	118
Screen detected	29	12	41
Total	106	53	159
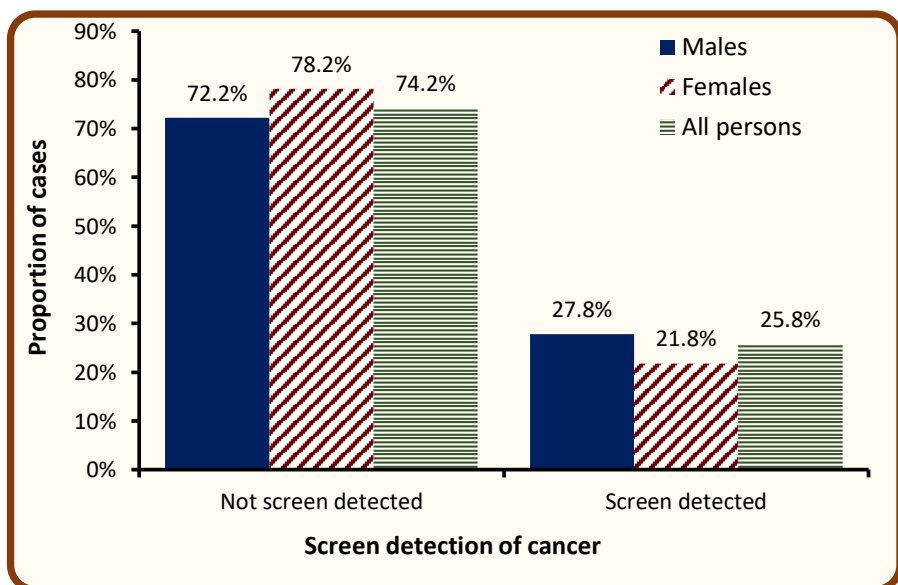
Bowel cancer screening is currently offered to all Northern Ireland residents aged 60 to 74 every two years.

This simple test checks for signs of colorectal cancer. In particular it can identify people who have no noticible cancer symptoms. Screening can thus help detect cancer at an early stage when treatment is more effective.

The presented figures are for people with colorectal cancer who were inititally identified via screening. It does not include those identified with polyps or who had a negative test.

Incidence by stage at diagnosis - *Rectal cancer, Cases in 2015-2019*

During 2015-2019:

▪ 91.2% of cases diagnosed had a stage assigned.

▪ 21.7% of cases were diagnosed at stage I. (23.8% of staged cases)

▪ 17.4% of cases were diagnosed at stage IV. (19.1% of staged cases)

▪ Among cases which were staged, 18.5% of male cases were diagnosed at stage IV, compared to 20.3% of female cases.

Stage at diagnosis	Average cases per year		
	Male	Female	Both sexes
Stage I (Early)	50	32	82
Stage II	40	19	59
Stage III	87	50	137
Stage IV (Late)	40	26	66
Unknown	18	15	33
All stages	234	142	376
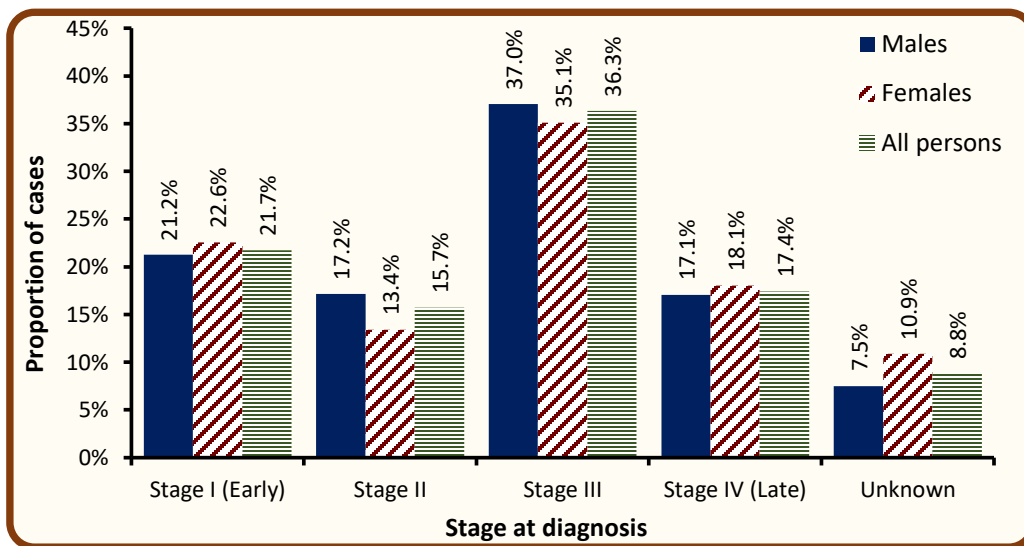
Cancer stage describes the size of a cancer and how far it has grown and spread.

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 - *Rectal cancer, Cases in 2015-2019*

During 2015-2019:

▪ 16.6% of cases among those aged 75 and over did not have a stage assigned at diagnosis, compared to 3.6% of cases among those aged 0 to 64.

▪ Among cases which were staged, 21.6% of cases among those aged 75 and over were diagnosed at stage IV, compared to 19.4% 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)	31	29	22	82
Stage II	18	17	24	59
Stage III	63	37	36	137
Stage IV (Late)	27	16	23	66
Unknown	5	7	21	33
All stages	145	106	125	376
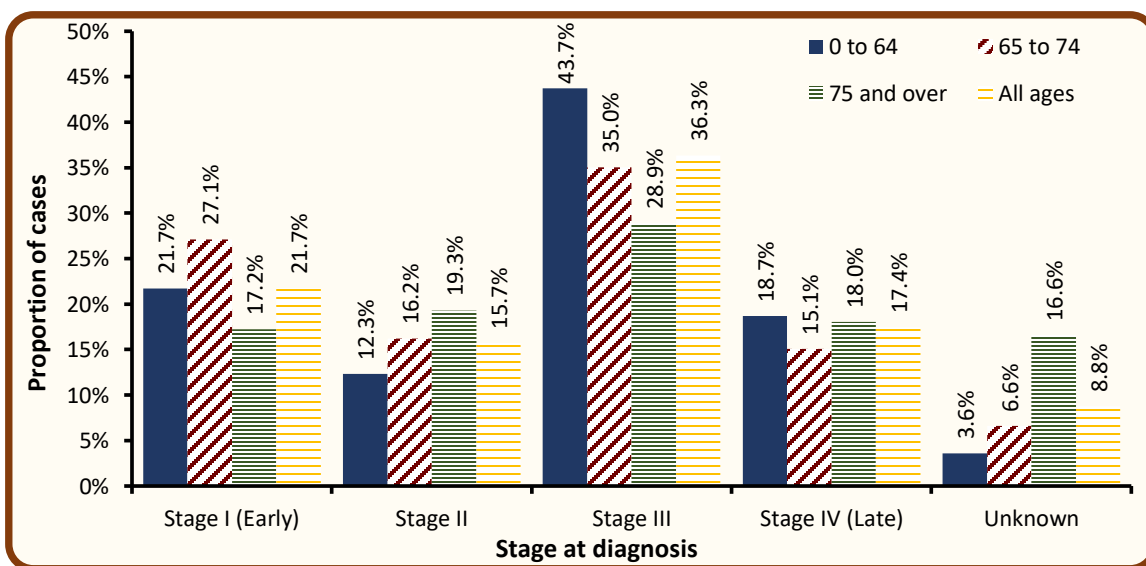
Survival

▪ 81.7% of patients were alive one year and 53.1% were alive five years from a rectal cancer diagnosis in 2010-2014. (observed survival)

▪ Age-standardised net survival (ASNS), which removes the effect of deaths from causes unrelated to cancer, was 84.6% one year and 62.1% five years from a rectal cancer diagnosis in 2010-2014.

▪ Five-year survival (ASNS) for rectal cancer patients diagnosed in 2010-2014 was 59.9% among men and 65.5% among women.

Gender	Observed survival		Age-standardised net survival	
	One-year	Five-years	One-year	Five-years
Male	82.1%	51.9%	84.4%	59.9%
Female	81.1%	55.1%	84.9%	65.5%
Both sexes	81.7%	53.1%	84.6%	62.1%

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.
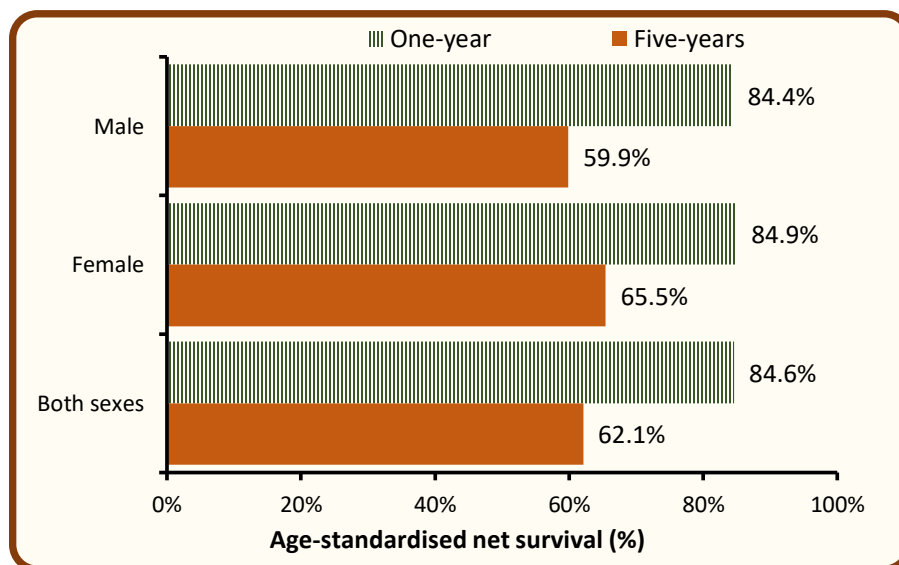
Trends in survival - *Rectal cancer, Patients diagnosed in 1995-2014*

▪ Among men five-year survival (ASNS) from rectal cancer increased from 55.8% in 2005-2009 to 59.9% in 2010-2014. This difference was not statistically significant.

▪ Among women five-year survival (ASNS) from rectal cancer increased from 57.3% in 2005-2009 to 65.5% in 2010-2014. This difference was not statistically significant.
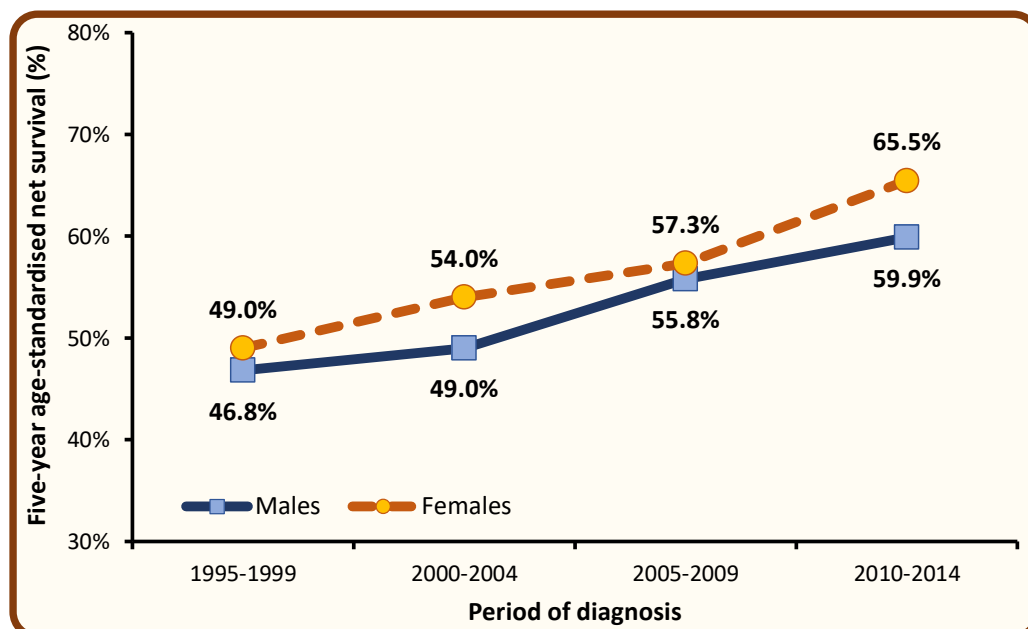
Survival by age at diagnosis - *Rectal cancer, Patients diagnosed in 2010-2014*

▪ Survival from rectal cancer among patients diagnosed in 2010-2014 was related to age with better five-year survival among younger age groups.

▪ Five-year net survival ranged from 71.5% among patients aged 55-64 at diagnosis to 50.3% among those aged 75 and over.

▪ Five-year net survival among patients aged 75 and over was 48.1% for men and 52.9% for women.
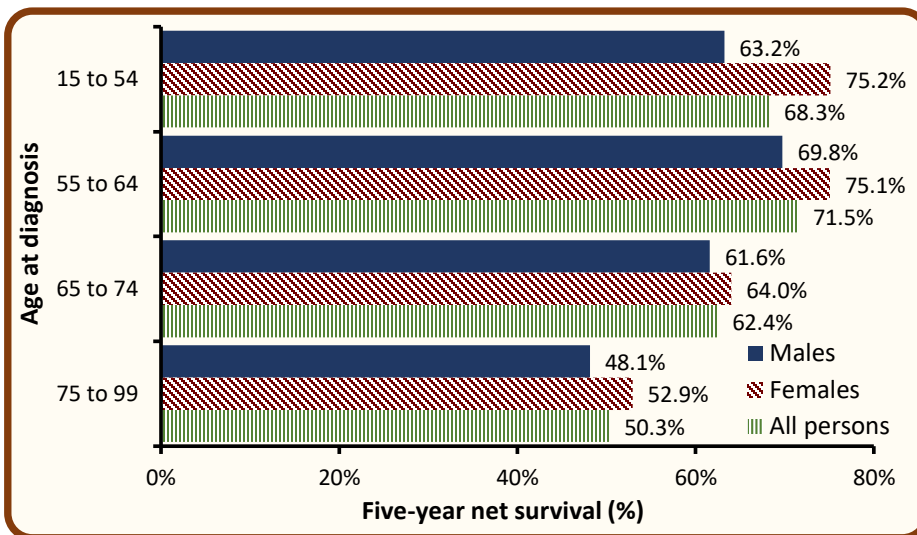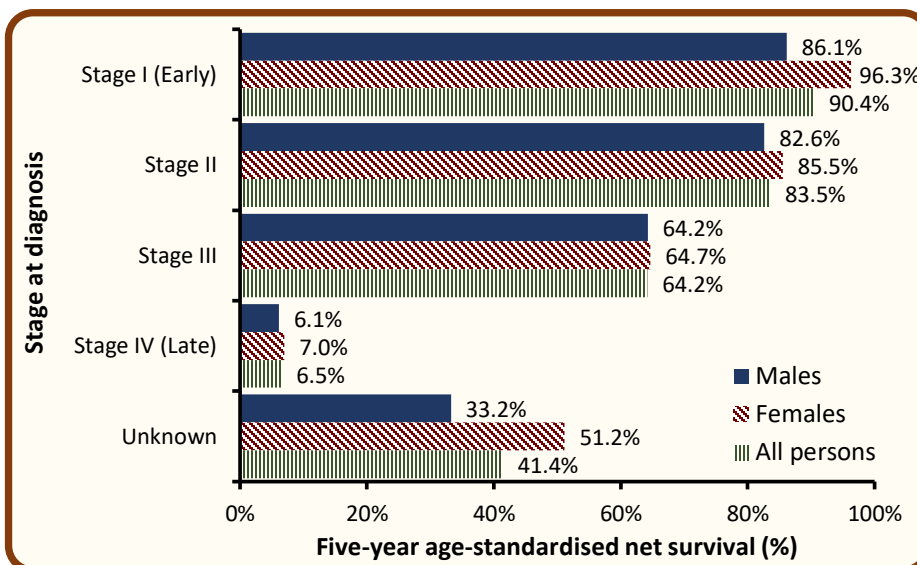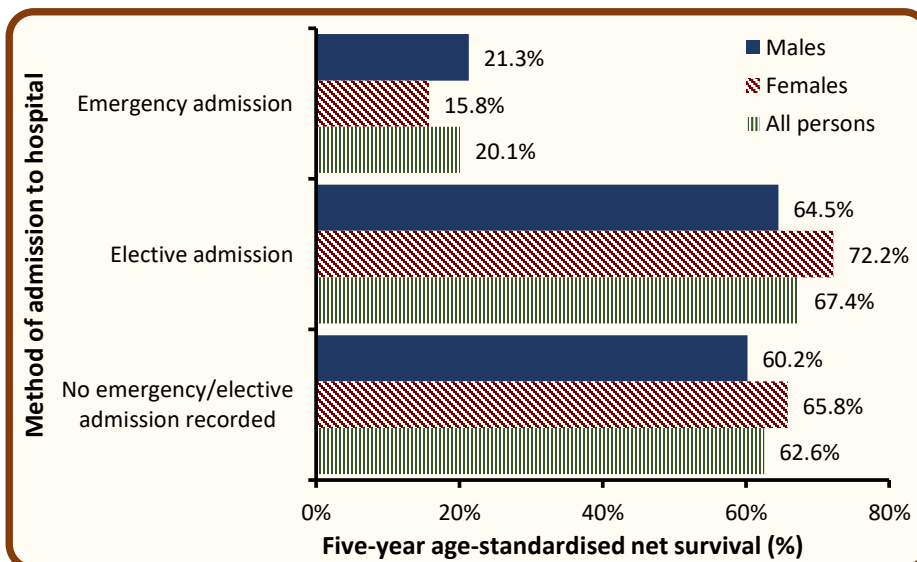
Age at diagnosis

Age	Males	Females	All persons
15 to 54	63.2%	75.2%	68.3%
55 to 64	69.8%	75.1%	71.5%
65 to 74	61.6%	64.0%	62.4%
75 to 99	48.1%	52.9%	50.3%

Five-year net survival (%)

Survival by stage at diagnosis - *Rectal cancer, Patients diagnosed in 2010-2014*

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

▪ Five-year survival (ASNS) from rectal cancer ranged from 90.4% for early stage (stage I) disease to 6.5% for late stage (stage IV) disease.

▪ Five-year survival (ASNS) for unstaged cancer was 41.4%.

▪ Five-year survival (ASNS) for stage IV cancer was 6.1% for men, compared to 7.0% for women.

Stage at diagnosis

Stage	Males	Females	All persons
Stage I (Early)	86.1%	96.3%	90.4%
Stage II	82.6%	85.5%	83.5%
Stage III	64.2%	64.7%	64.2%
Stage IV (Late)	6.1%	7.0%	6.5%
Unknown	33.2%	51.2%	41.4%

Five-year age-standardised net survival (%)

Survival by method of most recent admission to hospital - *Rectal cancer, Patients diagnosed in 2010-2014*

▪ Five-year survival (ASNS) among patients who had an emergency admission to hospital within 30 days prior to their cancer diagnosis was 20.1% compared to 67.4% among those with elective admissions and 62.6% 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 21.3% for men, compared to 15.8% for women.

Method of admission to hospital

Method	Males	Females	All persons
Emergency admission	21.3%	15.8%	20.1%
Elective admission	64.5%	72.2%	67.4%
No emergency/elective admission recorded	60.2%	65.8%	62.6%

Five-year age-standardised net survival (%)

Survival by screen detection of cancer *- Rectal cancer, Ages 60-74, Patients diagnosed in 2010-2014*

▪ Five-year survival among rectal cancer patients aged 60 to 74 whose cancer was detected by screening was 84.8% compared to 60.0% among those who were not detected via screening.

▪ Five-year survival among patients aged 60 to 74 whose cancer was detected via sceening was 84.3% for men, compared to 86.2% for women.

Screen detection of cancer (y-axis) / **Five-year net survival (%)** (x-axis)

Legend: ■ Males / ▨ Females / ▥ All persons

Not screen detected:
- Males: 59.6%
- Females: 60.7%
- All persons: 60.0%

Screen detected:
- Males: 84.3%
- Females: 86.2%
- All persons: 84.8%
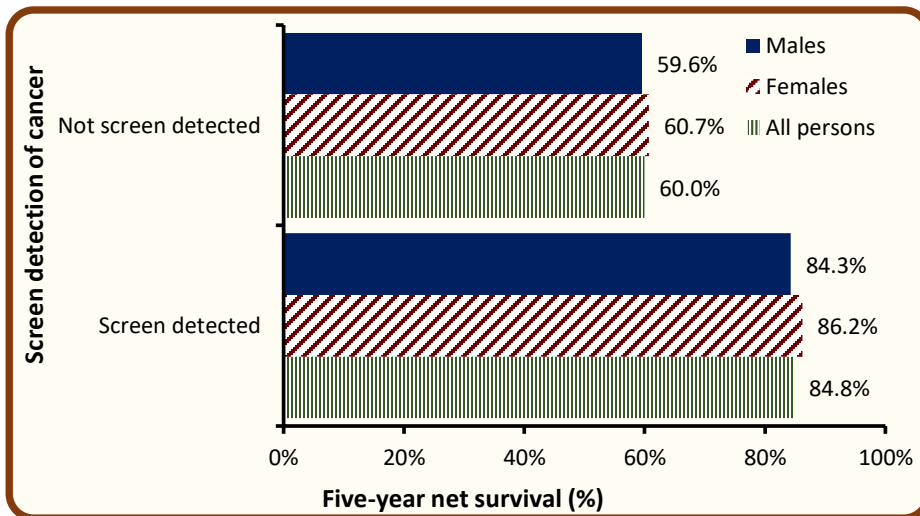
Prevalence

▪ At the end of 2019, there were 3,130 people (Males: 1,896; Females: 1,234) living with rectal cancer who had been diagnosed with the disease during 1995-2019.

▪ Of these, 60.6% were male, 41.6% were aged 75 and over, and 11.5% had been diagnosed in the previous year.

> 25-year prevalence refers to the number of cancer survivors who were alive at the end of 2019, and had been diagnosed with their cancer in the previous 25 years (i.e. 1995-2019).

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	173	98	271	57	31	88	230	129	359
1-5 years	397	242	639	200	112	312	597	354	951
5-10 years	313	197	510	204	148	352	517	345	862
10-25 years	232	176	408	320	230	550	552	406	958
0-25 years	1,115	713	1,828	781	521	1,302	1,896	1,234	3,130

Trends in 10-year prevalence *- Rectal cancer, Patients alive at end of each year from 2010-2019*

▪ Among males the number of survivors from rectal cancer who had been diagnosed within the previous ten years (10-year prevalence) increased by 9.0% from 1,233 survivors in 2014 to 1,344 survivors in 2019.

▪ Among females the number of survivors from rectal cancer who had been diagnosed within the previous ten years (10-year prevalence) increased by 5.3% from 786 survivors in 2014 to 828 survivors in 2019.

Year	10-year prevalence		
	Male	Female	Both sexes
2010	1,081	679	1,760
2011	1,138	706	1,844
2012	1,205	743	1,948
2013	1,202	776	1,978
2014	1,233	786	2,019
2015	1,247	791	2,038
2016	1,306	797	2,103
2017	1,309	793	2,102
2018	1,309	810	2,119
2019	1,344	828	2,172

Mortality

▪ During 2015-2019 there were 125 male and 91 female deaths from rectal cancer each year.

▪ Rectal cancer made up 5.4% of all male, and 4.4% of all female cancer deaths (ex NMSC).

Deaths by age at death - *Rectal cancer, Deaths in 2015-2019*

▪ The median age at death during 2015-2019 was 74 for men and 76 for women.

▪ Risk of death from rectal cancer was strongly related to patient age, with 48.8% of men and 56.0% of women aged 75 years or more at time of death.

▪ 8.8% of rectal cancer deaths occurred among those aged under 55.

| Age at death	Average deaths per year		
	Male	**Female**	**Both sexes**
0 - 54	11	8	19
54 - 64	20	11	31
65 - 74	32	21	53
75 +	61	51	112
All ages	125	91	217

Deaths by year of death - *Rectal cancer, Deaths in 2010-2019*

▪ Among males the number of deaths from rectal cancer increased by 31.6% from an annual average of 95 deaths in 2010-2014 to 125 deaths in 2015-2019.

▪ Among females the number of deaths from rectal cancer increased by 31.9% from an annual average of 69 deaths in 2010-2014 to 91 deaths in 2015-2019.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Male	87	91	96	103	97	112	104	135	125	151
Female	54	65	64	76	88	83	89	90	86	109
Both sexes	141	156	160	179	185	195	193	225	211	260

Trends in age-standardised mortality rates - *Rectal cancer, Deaths in 1995-2019*

▪ Among males age-standardised mortality rates from rectal cancer increased by 19.6% between 2010-2014 and 2015-2019 from 15.3 to 18.3 deaths per 100,000 persons years. This difference was statistically significant.

▪ Among females age-standardised mortality rates from rectal cancer increased by 21.2% between 2010-2014 and 2015-2019 from 8.5 to 10.3 deaths per 100,000 persons years. This difference was not statistically significant.
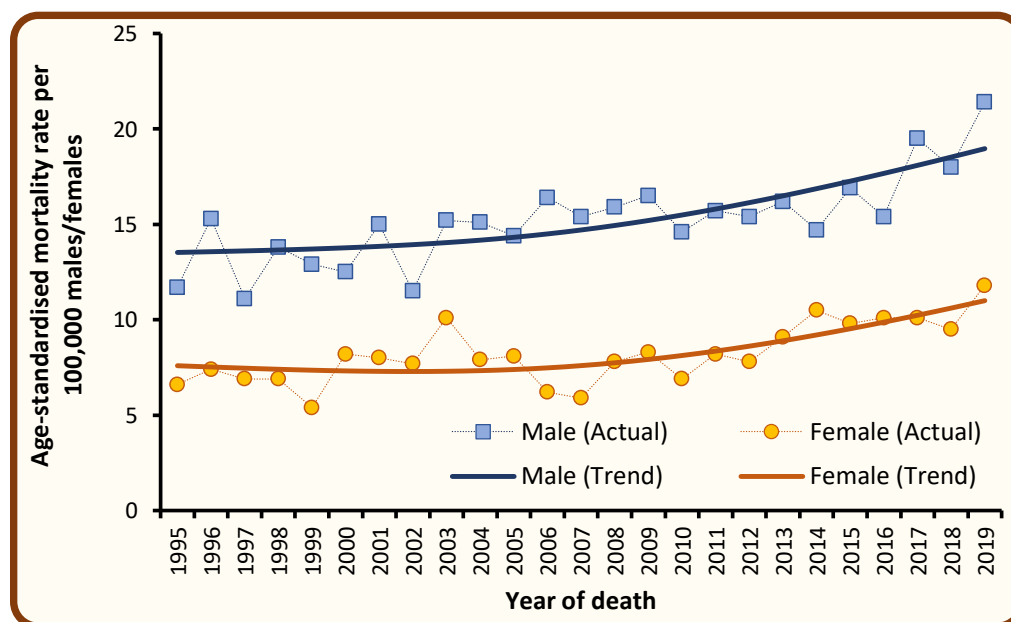
Mortality data are provided by the Northern Ireland General Registrar Office via the Department of Health.

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. rectal 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 2019 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.