# Prostate cancer

**Patients diagnosed 1993-2020**
**(ICD10: C61)**

## Further information

Further data is available at: **www.qub.ac.uk/research-centres/nicr**
Phone: +44 (0)28 9097 6028
e-mail: nicr@qub.ac.uk

## Acknowledgements

The Northern Ireland Cancer Registry (NICR) is funded by the Public Health Agency and is based in Queen's University, Belfast. NICR uses data provided by patients and collected by the health service as part of their care and support.

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.

# Incidence

During 2016-2020:

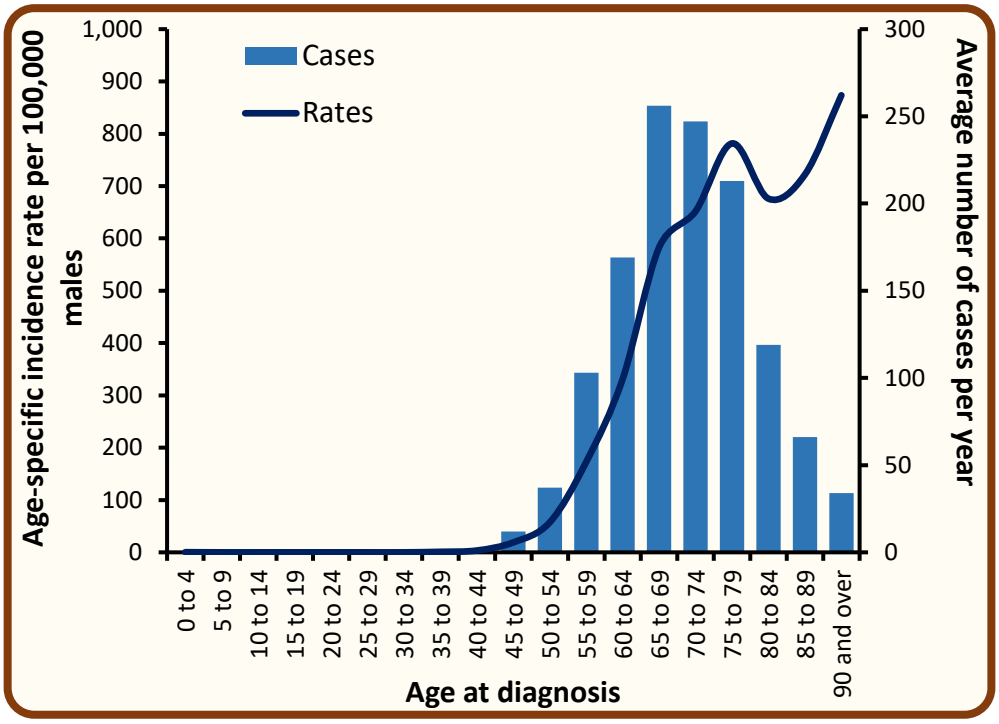
- There were 1,259 cases of prostate cancer diagnosed each year.
- The risk of prostate cancer before the age of 75 was 1 in 12, while before the age of 85 the risk was 1 in 7.

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

During 2016-2020:

- The median age at diagnosis of prostate cancer was 71.
- Cancer risk increased with age, with 34.3% of men aged 75 years or more at diagnosis.
- 4.1% of cases were diagnosed among those aged under 55.

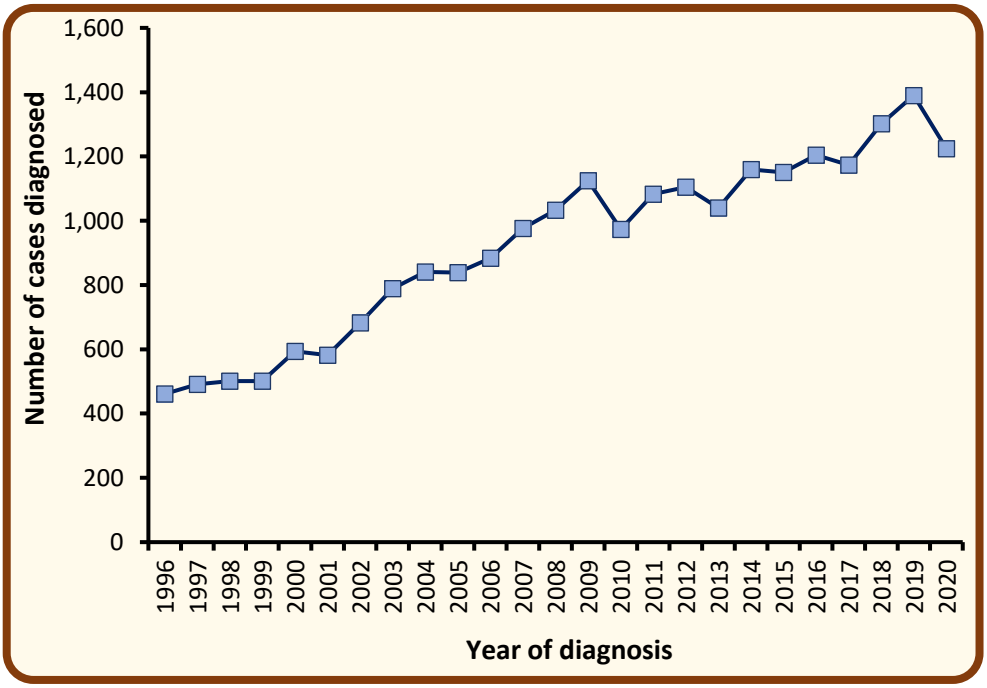
| Age at diagnosis | Average cases per year |
|---|---|
| | Male |
| 0 - 54 | 52 |
| 55 - 64 | 272 |
| 65 - 74 | 503 |
| 75 + | 432 |
| All ages | 1,259 |




## Incidence by year of diagnosis - *Prostate cancer, Cases in 1996-2020*

- Among males the number of cases of prostate cancer increased by 13.7% from an annual average of 1,107 cases in 2011-2015 to 1,259 cases in 2016-2020.

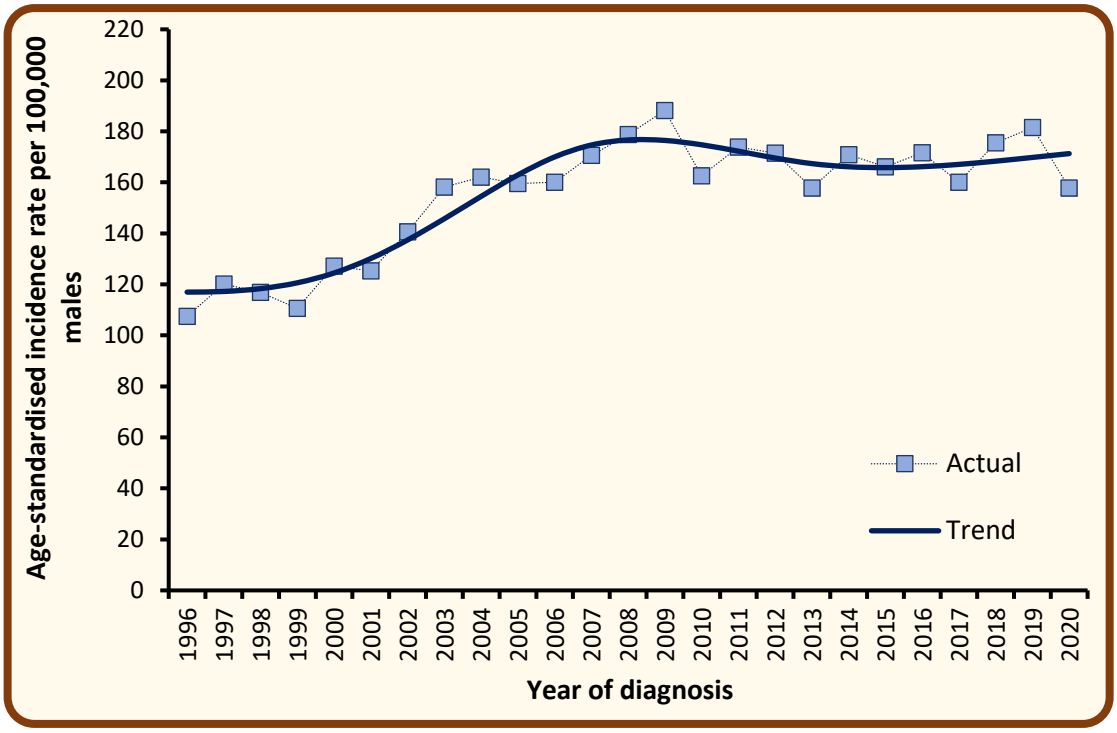
| Year of diagnosis | Male cases |
|---|---|
| 2011 | 1,083 |
| 2012 | 1,105 |
| 2013 | 1,040 |
| 2014 | 1,159 |
| 2015 | 1,150 |
| 2016 | 1,204 |
| 2017 | 1,173 |
| 2018 | 1,302 |
| 2019 | 1,390 |
| 2020 | 1,224 |




*Note: Annual averages based upon several years 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 - *Prostate cancer, Cases in 1996-2020*

▪ Among males age-standardised incidence rates of prostate cancer increased by 0.7% from 168.0 per 100,000 person years in 2011-2015 to 169.2 cases per 100,000 persons years in 2016-2020. 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 - *Prostate cancer, Cases in 1996-2020*

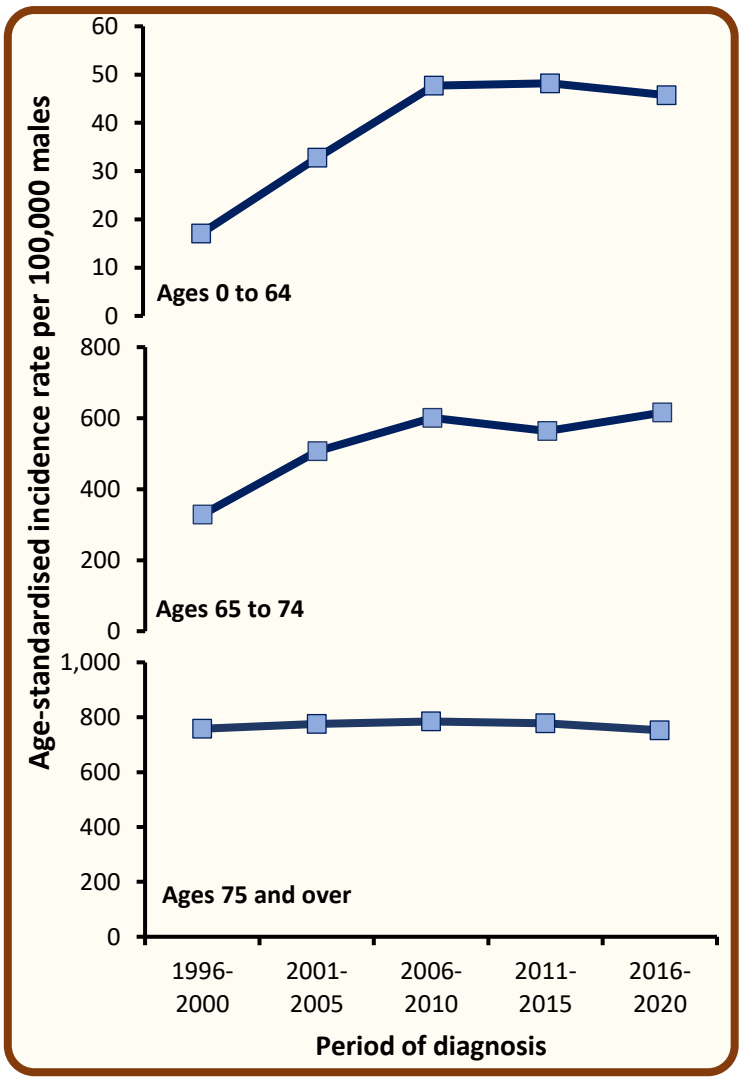
For the total number of cases recorded, between 2011-2015 and 2016-2020 there was:

▪ an increase of 3.8% among men aged 0 to 64, an increase of 21.8% among men aged 65 to 74 and an increase of 13.1% among men aged 75 and over.

| Age group | Average cases per year | |
|---|---|---|
| | 2011-2015 | 2016-2020 |
| | Male | Male |
| 0 to 64 | 312 | 324 |
| 65 to 74 | 413 | 503 |
| 75 and over | 382 | 432 |
| All ages | **1,107** | **1,259** |

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

▪ no significant change among men aged 0 to 64, an increase of 9.3% among men aged 65 to 74 and no significant change among men aged 75 and over.



## Incidence by deprivation quintile - *Prostate 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:

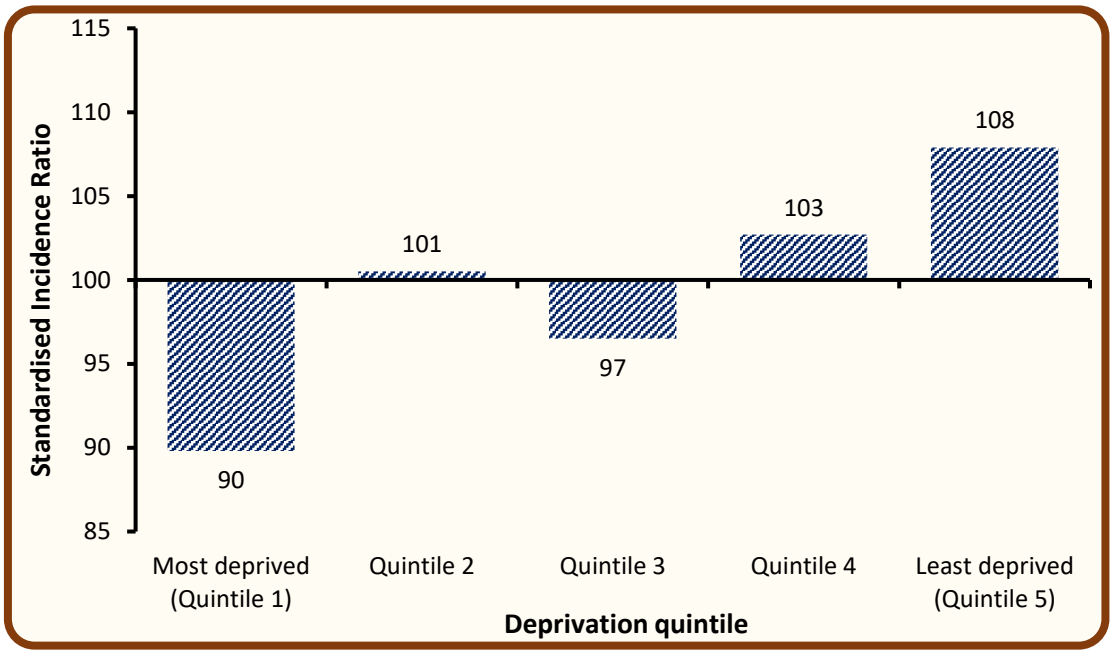
- in the least socio-economically deprived areas were 7.9% higher than the NI average.
- in the most socio-economically deprived areas were 10.2% lower than the NI average.

| Deprivation quintile | Average cases per year |
|---|---|
| | Male |
| Most deprived (Quintile 1) | 182 |
| Quintile 2 | 252 |
| Quintile 3 | 260 |
| Quintile 4 | 277 |
| Least deprived (Quintile 5) | 288 |
| Northern Ireland | 1,259 |

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.



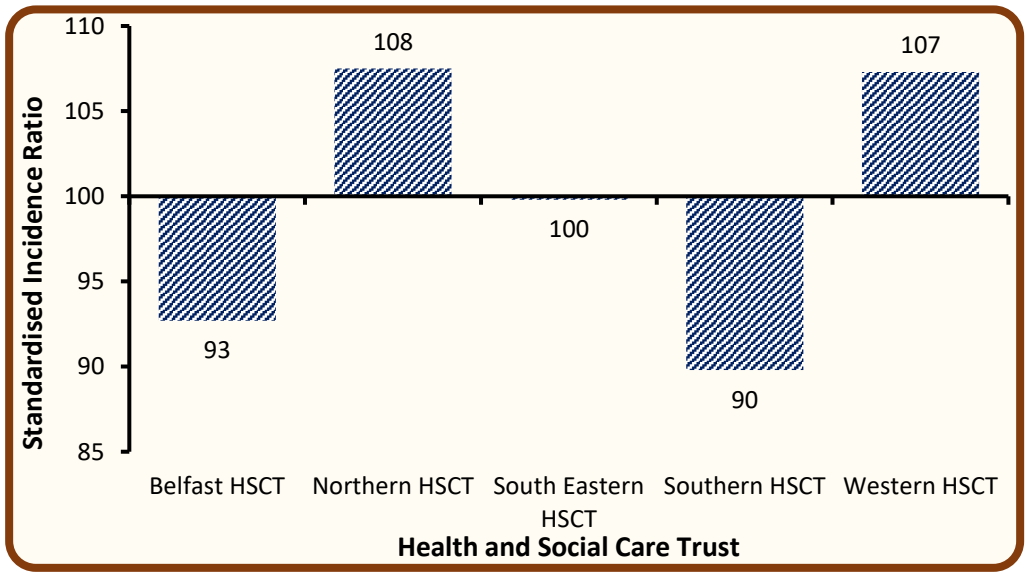

## Incidence by Health and Social Care Trust (HSCT) - *Prostate cancer, Cases in 2016-2020*

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 lower than the NI average.
- in Northern HSCT were significantly higher than the NI average.
- in South-Eastern HSCT did not vary significantly from the NI average.
- in Southern HSCT were significantly lower than the NI average.
- in Western HSCT were significantly higher than the NI average.

| Health and Social Care Trust | Average cases per year |
|---|---|
| | Male |
| Belfast HSCT | 199 |
| Northern HSCT | 363 |
| South Eastern HSCT | 268 |
| Southern HSCT | 211 |
| Western HSCT | 216 |
| Northern Ireland | 1,259 |




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.

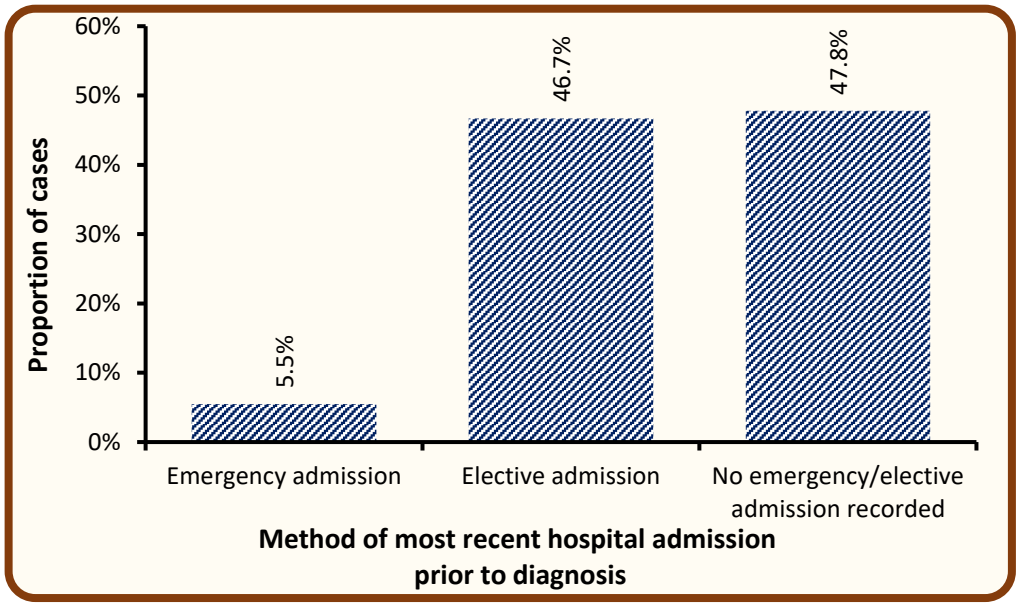
Data for Local Government Districts and Parliamentary Constituencies are available at www.qub.ac.uk/research-centres/nicr

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

During 2016-2020:

- 5.5% of cases had an emergency admission to hospital recorded within 30 days prior to their cancer diagnosis.
- In 47.8% 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 |
| Emergency admission | 69 |
| Elective admission | 588 |
| No emergency/elective admission recorded | 602 |
| Total | 1,259 |




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.

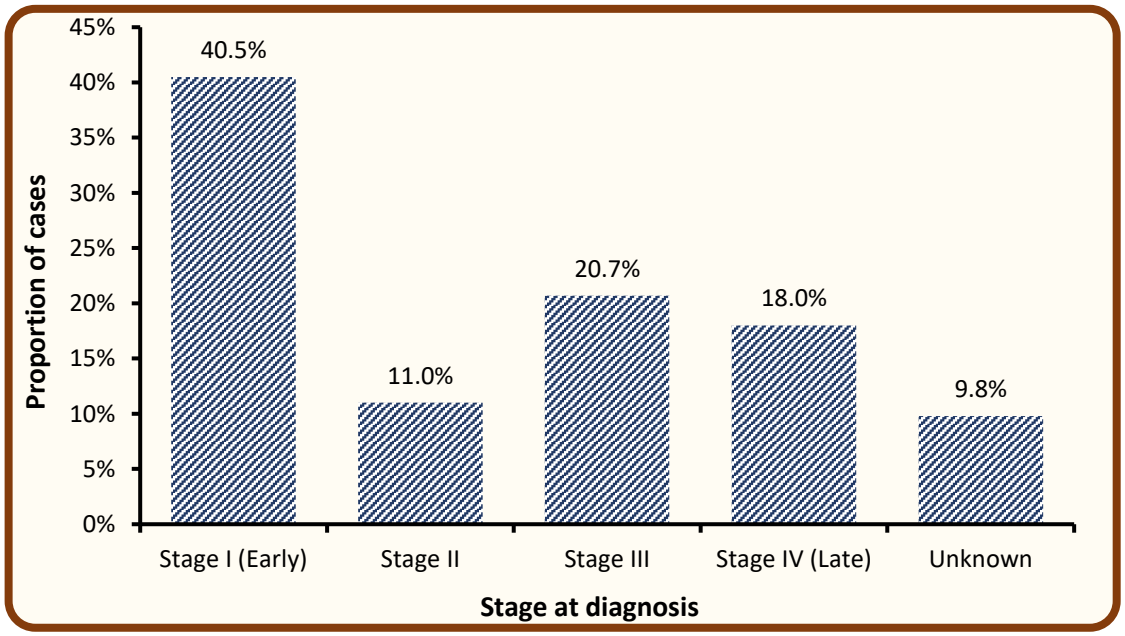
The majority of patients with no inpatient admission recorded prior to diagnosis are likely to have been diagnosed via an outpatient route.

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

During 2016-2020:

- 90.2% of cases diagnosed had a stage assigned.
- 40.5% of cases were diagnosed at stage I. (44.9% of staged cases)
- 18.0% of cases were diagnosed at stage IV. (19.9% of staged cases)

| Stage at diagnosis | Average cases per year |
|---|---|
| | Male |
| Stage I (Early) | 510 |
| Stage II | 139 |
| Stage III | 261 |
| Stage IV (Late) | 226 |
| Unknown | 123 |
| All stages | 1,259 |




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.

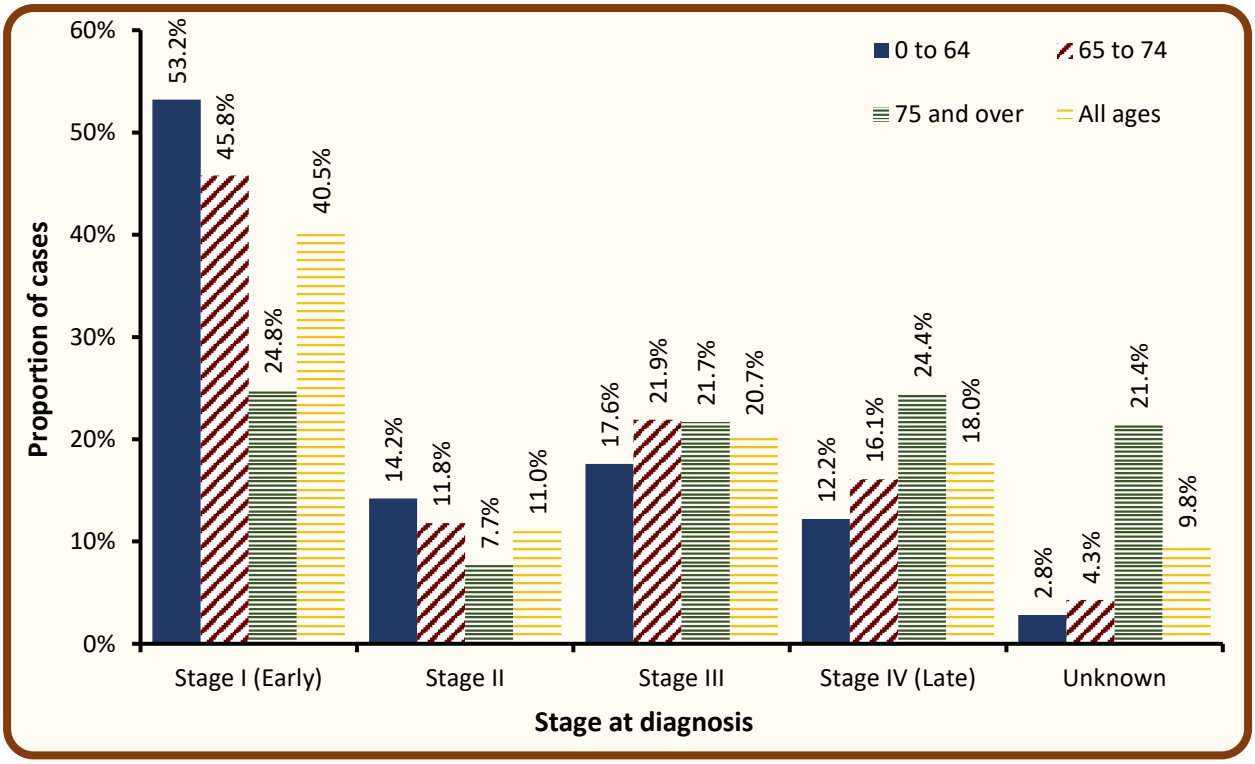
The classification used here to stage cancer is the TNM classification (Version 7 prior to 2018, Version 8 from 2018 onwards).

## Incidence by age and stage at diagnosis - *Prostate cancer, Cases in 2016-2020*

During 2016-2020:

- 21.4% of cases among those aged 75 and over did not have a stage assigned at diagnosis, compared to 2.8% of cases among those aged 0 to 64.
- Among cases which were staged, 31.1% of cases among those aged 75 and over were diagnosed at stage IV, compared to 12.5% 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) | 172 | 231 | 107 | 510 |
| Stage II | 46 | 59 | 33 | 139 |
| Stage III | 57 | 110 | 94 | 261 |
| Stage IV (Late) | 39 | 81 | 105 | 226 |
| Unknown | 9 | 22 | 92 | 123 |
| All stages | 324 | 503 | 432 | 1,259 |



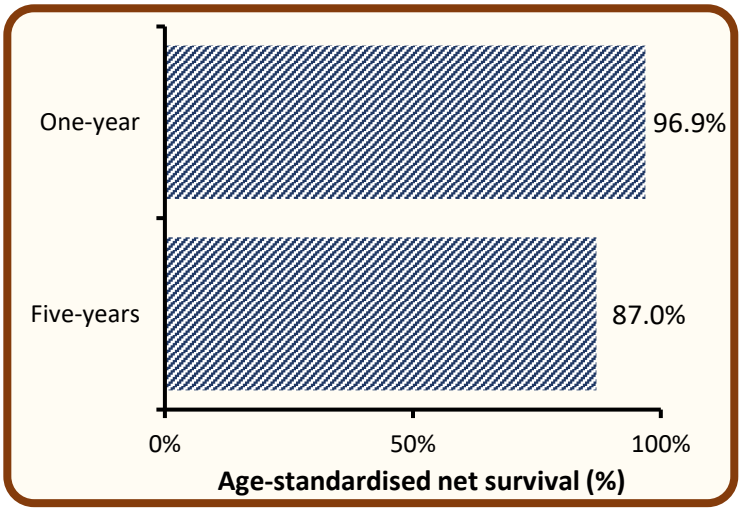

## Survival

- 93.2% of patients were alive one year and 71.9% were alive five years from a prostate cancer diagnosis in 2011-2015. (observed survival)
- Age-standardised net survival (ASNS), which removes the effect of deaths from causes unrelated to cancer, was 96.9% one year and 87.0% five years from a prostate cancer diagnosis in 2011-2015.

| Survival time | Observed survival | Age-standardised net survival |
|---|---|---|
| One-year | 93.2% | 96.9% |
| Five-years | 71.9% | 87.0% |

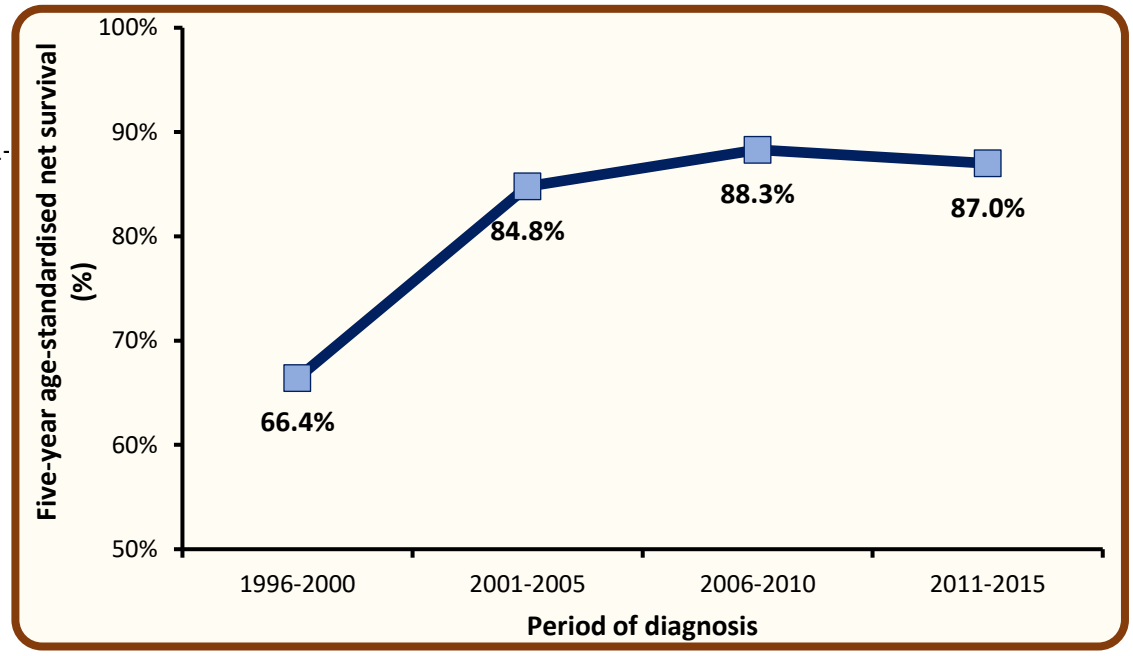
Observed survival is the proportion of patients still alive one/five years after diagnosis. However, in this measure patients may have died from causes unrelated to their cancer.

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 - *Prostate cancer, Patients diagnosed in 1996-2015*

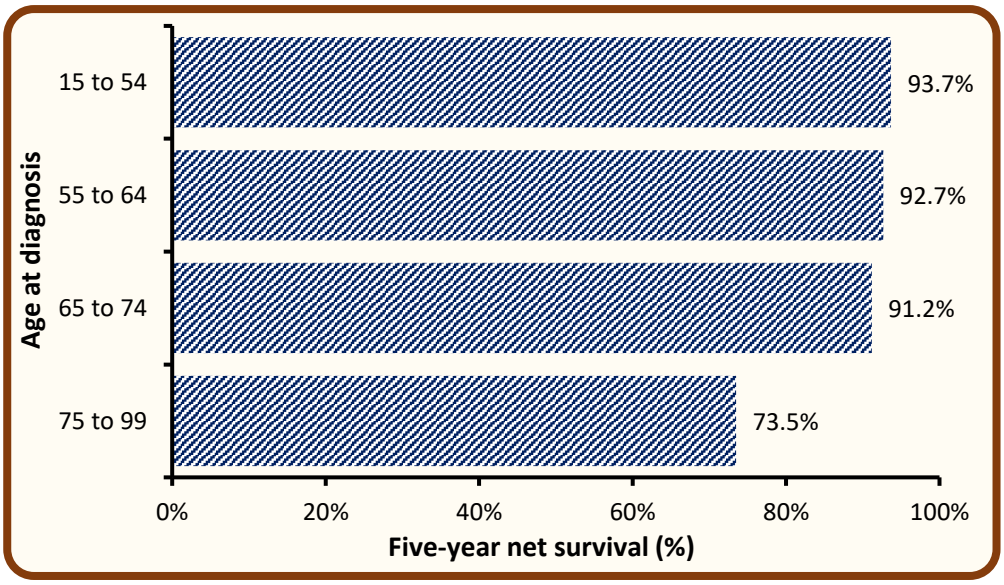
▪ Five-year survival (ASNS) from prostate cancer decreased from 88.3% in 2006-2010 to 87.0% in 2011-2015. This difference was not statistically significant.




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

▪ Survival from prostate cancer among patients diagnosed in 2011-2015 was strongly related to age with five-year survival decreasing as age increases.

▪ Five-year net survival ranged from 93.7% among patients aged 15-54 at diagnosis to 73.5% among those aged 75 and over.

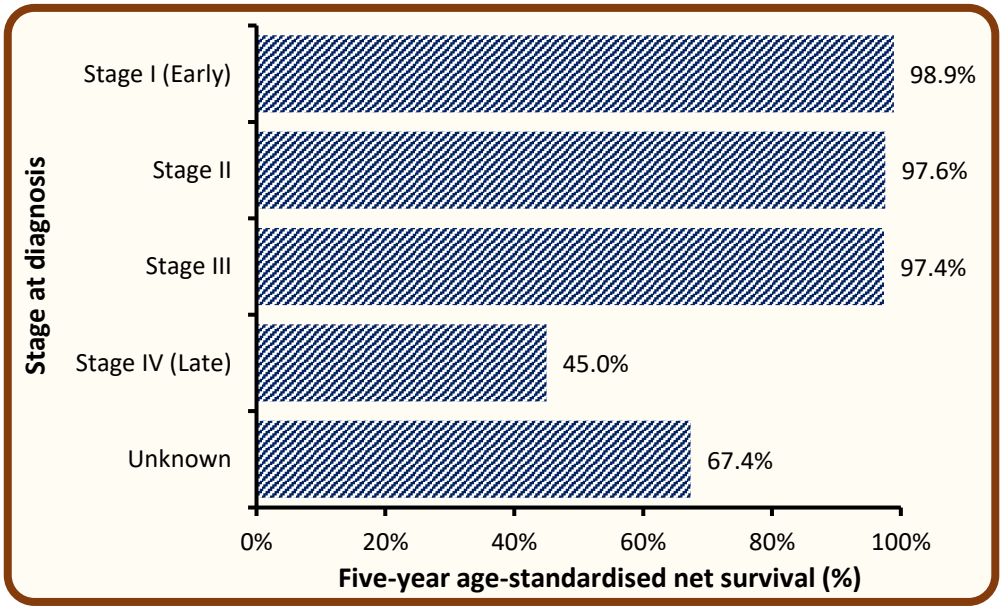



## Survival by stage at diagnosis - *Prostate cancer, Patients diagnosed in 2011-2015*

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

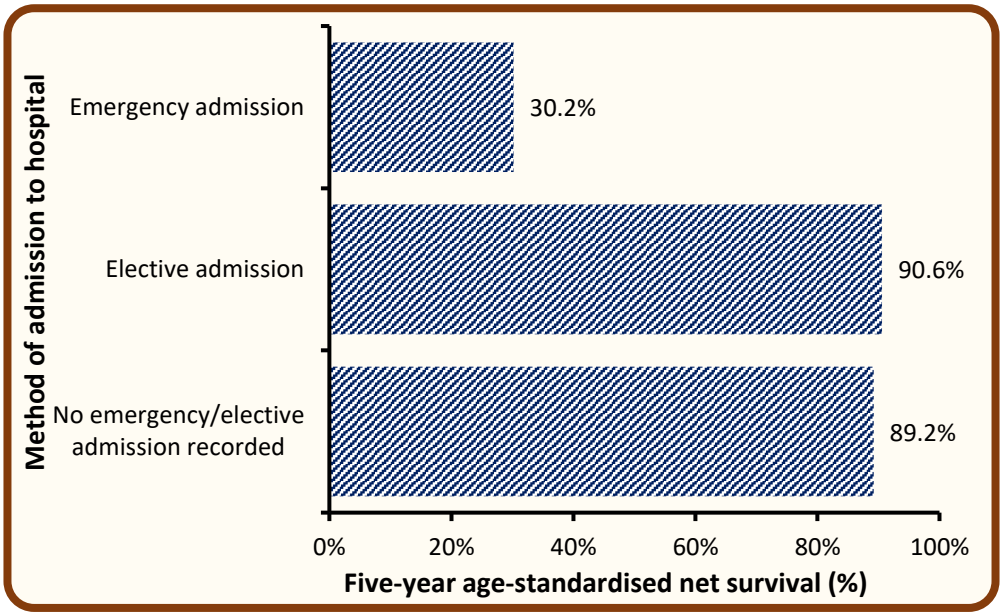
▪ Five-year survival (ASNS) ranged from 98.9% for early stage (stage I) disease to 45.0% for late stage (stage IV) disease.

▪ Five-year survival (ASNS) for unstaged cancer was 67.4%.



## Survival by method of most recent admission to hospital - *Prostate cancer, Patients diagnosed in 2011-2015*

▪ Five-year survival (ASNS) among patients who had an emergency admission to hospital up to 30 days prior to their cancer diagnosis was 30.2% compared to 90.6% among those with elective admissions and 89.2% among those who had no hospital admissions recorded up to 30 days prior to diagnosis.




# Prevalence

▪ At the end of 2020, there were 12,056 men living with prostate cancer who had been diagnosed in the previous 25 years.

▪ Of these, 49.4% were aged 75 and over, and 9.6% 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 |
| 0-1 year | 773 | 387 | 1,160 |
| 1-5 years | 2,527 | 1,653 | 4,180 |
| 5-10 years | 1,771 | 1,693 | 3,464 |
| 10-25 years | 1,024 | 2,228 | 3,252 |
| 0-25 years | 6,095 | 5,961 | 12,056 |

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

▪ Among men the number of survivors from prostate cancer who had been diagnosed within the previous ten years increased by 13.4% from 7,763 survivors in 2015 to 8,804 survivors in 2020.

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male | 6,584 | 6,940 | 7,169 | 7,484 | 7,763 | 7,986 | 8,137 | 8,387 | 8,641 | 8,804 |

# Mortality

▪ During 2016-2020 there were 287 deaths from prostate cancer each year. It made up 12.3% of all male cancer deaths (ex NMSC).

▪ Risk of death from prostate cancer was strongly related to age, with 72.1% of men aged 75 years or more at time of death, while 0.7% of prostate cancer deaths occurred among those aged under 55. The median age at death was 81.

| Age at death | Average deaths per year |
|---|---|
| 0 - 54 | 2 |
| 54 - 64 | 19 |
| 65 - 74 | 59 |
| 75 + | 207 |

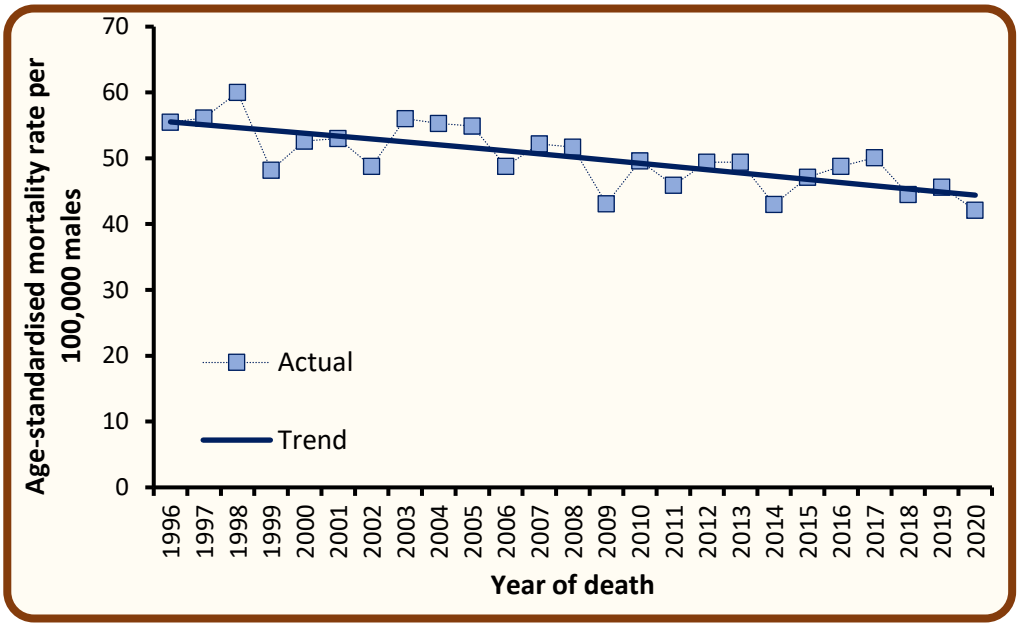
## Deaths by year of death - *Prostate cancer, Deaths in 2011-2020*

▪ Among men the number of deaths from prostate cancer increased by 12.1% from an annual average of 256 deaths in 2011-2015 to 287 deaths in 2016-2020.

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male | 234 | 266 | 271 | 243 | 267 | 293 | 300 | 276 | 290 | 277 |

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

▪ Among males age-standardised mortality rates from prostate cancer decreased by 1.9% between 2011-2015 and 2016-2020 from 47.0 to 46.1 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. prostate 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.