Prostate cancer

1993-2021

(ICD10 codes: C61)

Northern Ireland Cancer Registry, 2024

An official statistics publication

ABOUT THIS REPORT

Contents

This report includes information on incidence of prostate cancer as recorded by the Northern Ireland Cancer Registry (NICR). Incidence data is available annually from 1993 to 2021, however in order to provide stable and robust figures the majority of information presented in this report is based upon the average number of cases diagnosed in the last 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

The information in this report (and any supplementary material) is available for reuse free of charge and without the need to contact NICR. However, we request that NICR is acknowledged as the source of any reused information. The following reference is recommended:
Northern Ireland Cancer Registry 2024. Prostate 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

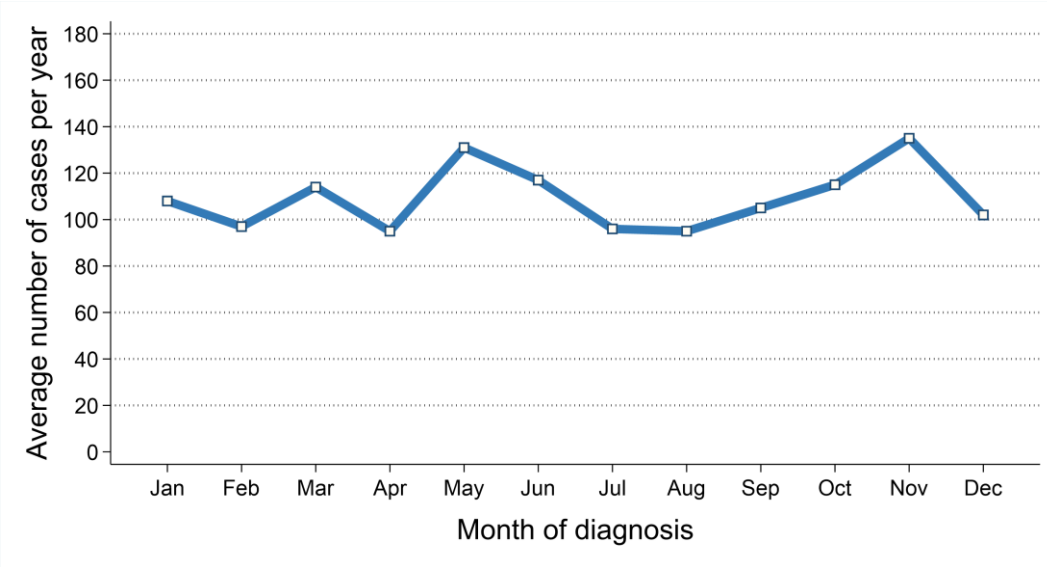
The Northern Ireland Cancer Registry (NICR) uses data provided by patients and collected by the health service as part of their care and support.

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

INCIDENCE

- There were 6,552 cases of prostate cancer diagnosed during 2017-2021 in Northern Ireland. On average this was 1,310 cases per year.
- The most common diagnosis month during 2017-2021 was November with 135 cases per year.

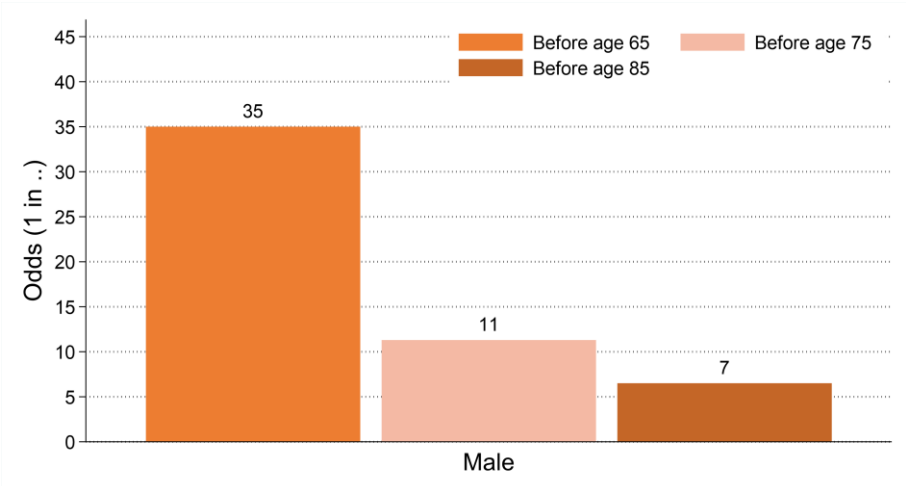
Figure 1: Average number of cases of prostate cancer per year in 2017-2021 by month of diagnosis



Month of diagnosis	Average number of cases per year
	Males
January	108
February	97
March	114
April	95
May	131
June	117
July	96
August	95
September	105
October	115
November	135
December	102

- Prostate cancer made up 25.6% of all male cancer cases (excluding non-melanoma skin cancer).
- The prostate cancer incidence rate was 140.9 cases per 100,000 males.
- The odds of developing prostate cancer before age 85 was 1 in 7.

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



INCIDENCE BY AGE

- The median age of males diagnosed with prostate cancer during 2017-2021 was 71 years.
- The risk of being diagnosed with prostate cancer varied by age, with 34.9% of men diagnosed with prostate cancer aged 75 and over at diagnosis.
- In contrast, 3.8% of men diagnosed with prostate cancer were aged 0 to 54 at diagnosis.

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

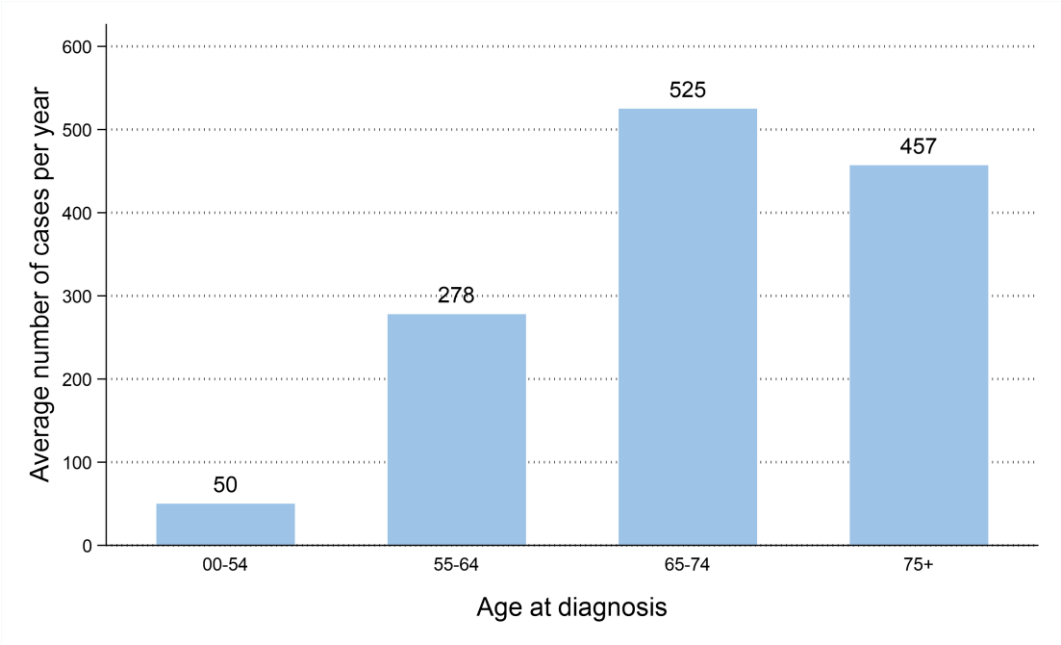
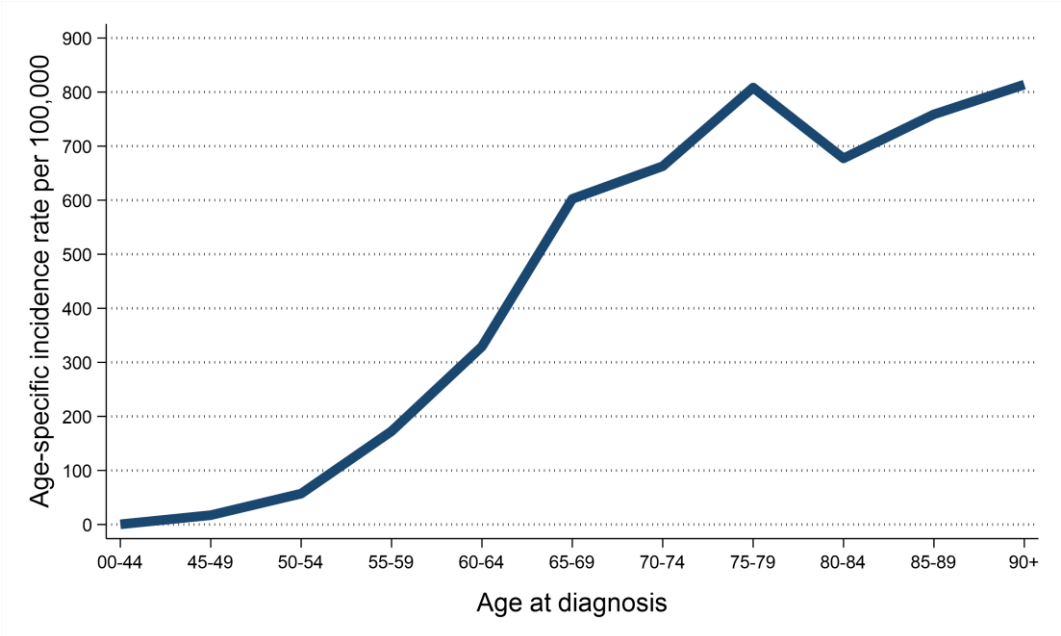


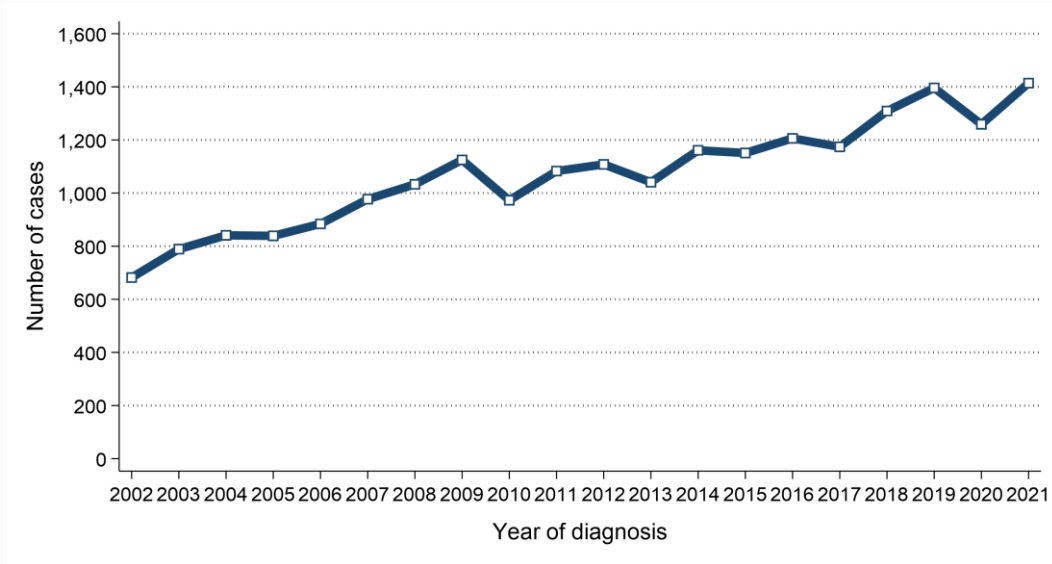
Figure 4: Age-specific incidence rates of prostate cancer in 2017-2021



INCIDENCE TRENDS

- The number of cases of prostate cancer among males increased between 2012-2016 and 2017-2021 by 15.6% from 5,667 cases (1,133 cases per year) to 6,552 cases (1,310 cases per year).

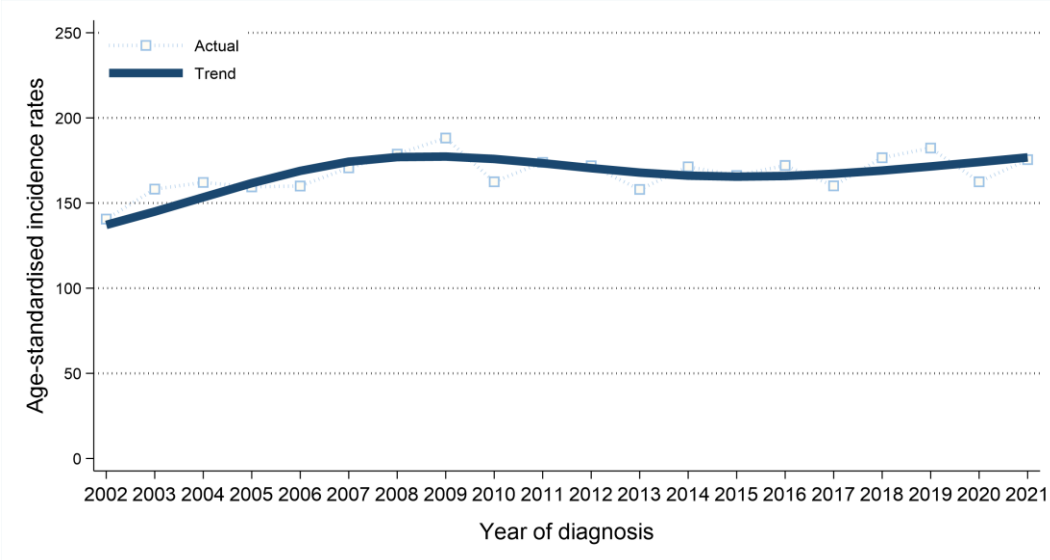
Figure 5: Trends in number of cases of prostate cancer diagnosed from 2002 to 2021



Year of diagnosis	Number of cases
	Males
2012	1,108
2013	1,041
2014	1,161
2015	1,151
2016	1,206
2017	1,174
2018	1,309
2019	1,396
2020	1,259
2021	1,414

- Male age-standardised prostate cancer incidence rates increased between 2012-2016 and 2017-2021 by 2.1% from 168.0 to 171.5 cases per 100,000 males. This change was not statistically significant.

Figure 6: Trends in incidence rates of prostate 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

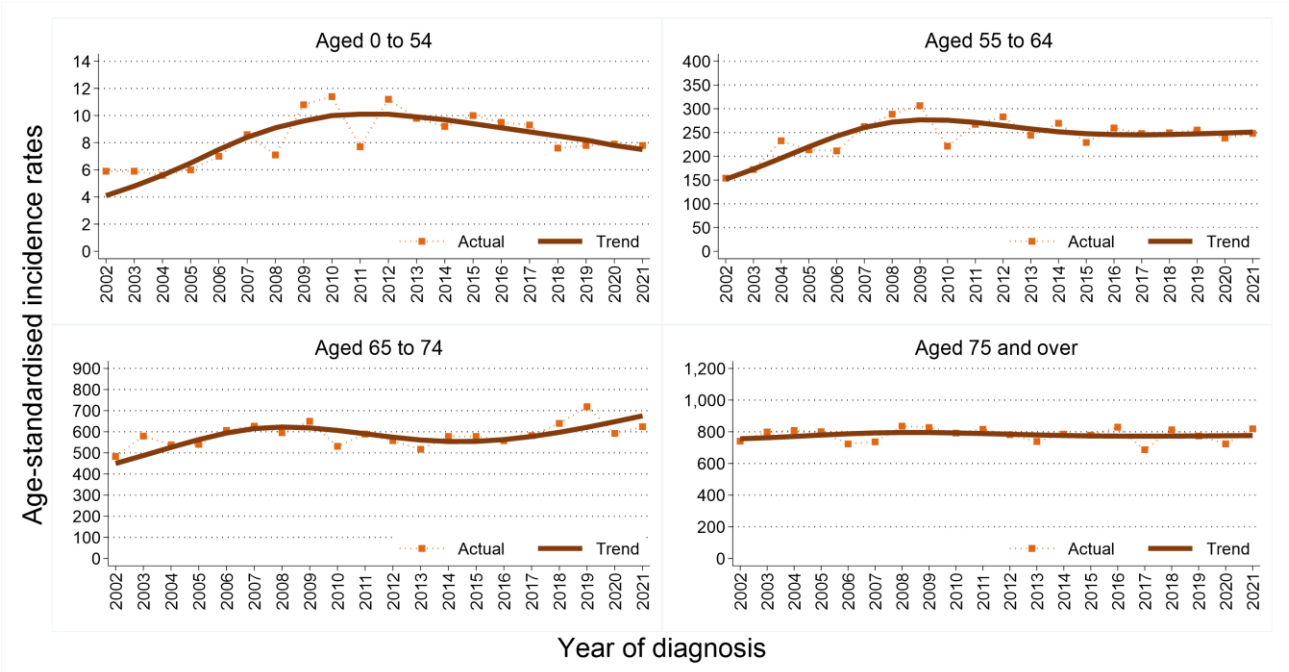
- Between 2012-2016 and 2017-2021 the number of cases of prostate cancer among
  - Males aged 0 to 54 decreased by 17.8%.
  - Males aged 55 to 64 increased by 7.9%.
  - Males aged 65 to 74 increased by 24.8%.
  - Males aged 75 and over increased by 16.0%.

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

Age at diagnosis	Male	
	2012-2016	2017-2021
All ages	**1,133**	**1,310**
	.	.
0 to 54	61	50
55 to 64	258	278
65 to 74	421	525
75 and over	394	457

- Between 2012-2016 and 2017-2021 age-standardised incidence rates of prostate cancer among
  - Males aged 0 to 54 did not change significantly.
  - Males aged 55 to 64 did not change significantly.
  - Males aged 65 to 74 increased by 13.2%.
  - Males aged 75 and over did not change significantly.

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



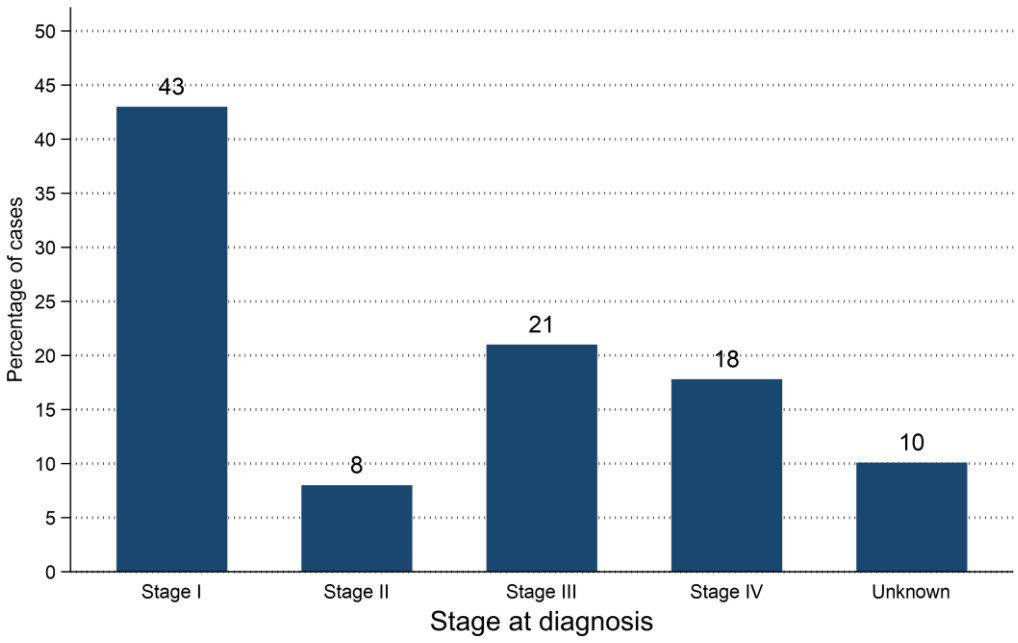
INCIDENCE BY STAGE AT DIAGNOSIS

- During 2017-2021 89.9% of prostate cancer cases had a stage assigned.
- 43.0% of prostate cancer cases were diagnosed at Stage I. (47.9% of staged cases)
- 17.8% of prostate cancer cases were diagnosed at Stage IV. (19.9% of staged cases)

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

Stage at diagnosis	Male	
	Total cases in period	Average cases per year
All stages	**6,552**	**1,310**
	.	.
Stage I	2,818	564
Stage II	524	105
Stage III	1,376	275
Stage IV	1,169	234
Unknown	665	133

Figure 8: Proportion of cases of prostate 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).

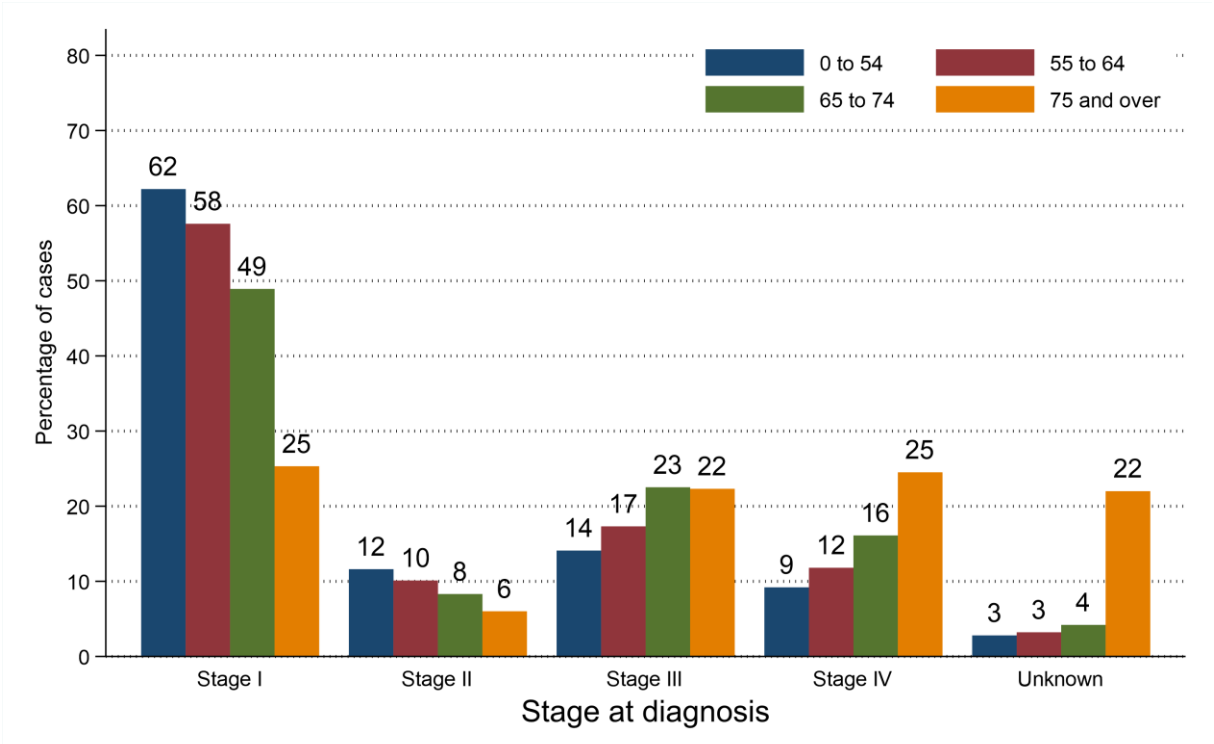
INCIDENCE BY STAGE AND AGE AT DIAGNOSIS

- During 2017-2021 78.0% of prostate cancer cases among those aged 75 and over had a stage assigned compared to 97.2% of those aged 0 to 54.
- 25.3% of prostate cancer cases among those aged 75 and over were diagnosed at Stage I (32.4% of staged cases) compared to 62.2% of those aged 0 to 54 (64.0% of staged cases).
- 24.5% of prostate cancer cases among those aged 75 and over were diagnosed at Stage IV (31.3% of staged cases) compared to 9.2% of those aged 0 to 54 (9.5% of staged cases).

Table 3: Average number of cases of prostate 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	**1,310**	**50**	**278**	**525**	**457**
	.	.	.	.	.
Stage I	564	31	160	257	116
Stage II	105	6	28	44	27
Stage III	275	7	48	118	102
Stage IV	234	5	33	85	112
Unknown	133	1	9	22	100

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



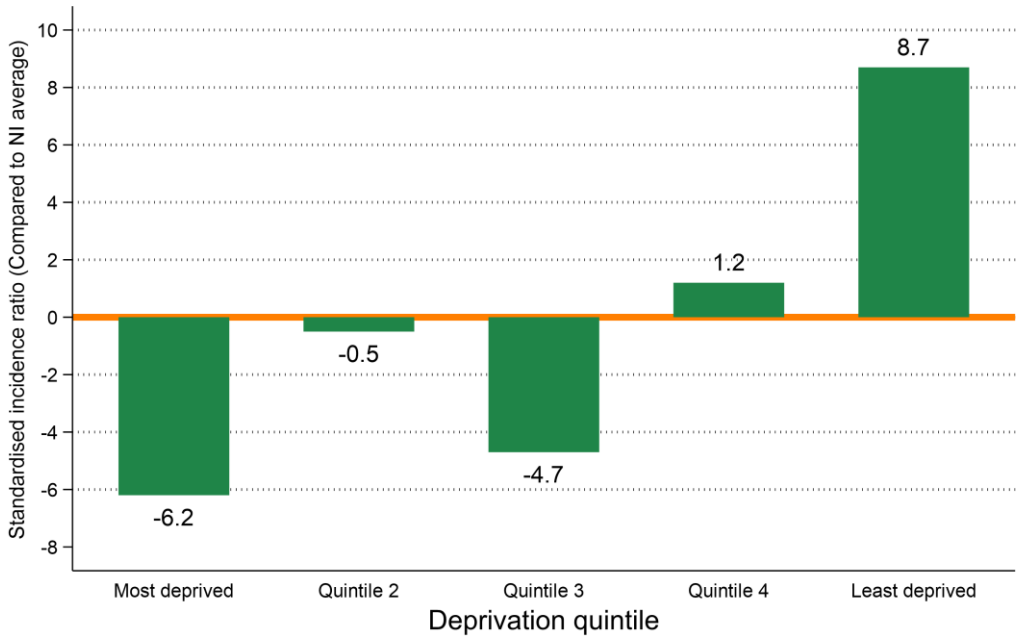
INCIDENCE BY DEPRIVATION

- The number of cases of prostate 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 6.2% lower than the NI average.
  - in the least socio-economically deprived areas were 8.7% higher than the NI average.

Table 4: Number of cases of prostate cancer diagnosed in 2017-2021 by deprivation quintile

Deprivation quintile	Male	
	Total cases in period	Average cases per year
Northern Ireland	**6,552**	**1,310**
	.	.
Most deprived	983	197
Quintile 2	1,296	259
Quintile 3	1,335	267
Quintile 4	1,424	285
Least deprived	1,514	303
Unknown	0	0

Figure 10: Standardised incidence ratio comparing deprivation quintile to Northern Ireland for prostate 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.

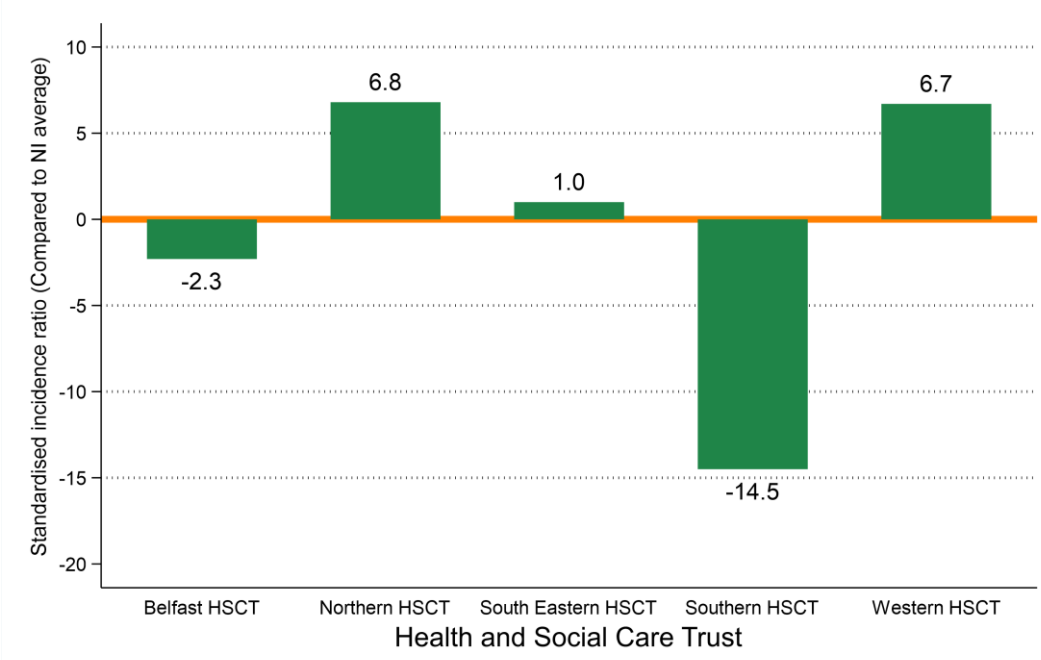
INCIDENCE BY HEALTH AND SOCIAL CARE TRUST

- The number of cases of prostate 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 did not vary significantly from the NI average.
  - in Northern HSCT were 6.8% higher than the NI average.
  - in South Eastern HSCT did not vary significantly from the NI average.
  - in Southern HSCT were 14.5% lower than the NI average.
  - in Western HSCT were 6.7% higher than the NI average.

Table 5: Number of cases of prostate cancer diagnosed in 2017-2021 by Health and Social Care Trust

Health and Social Care Trust	Male	
	Total cases in period	Average cases per year
Northern Ireland	**6,552**	**1,310**
	.	.
Belfast HSCT	1,087	217
Northern HSCT	1,877	375
South Eastern HSCT	1,416	283
Southern HSCT	1,050	210
Western HSCT	1,122	224
Unknown	0	0

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



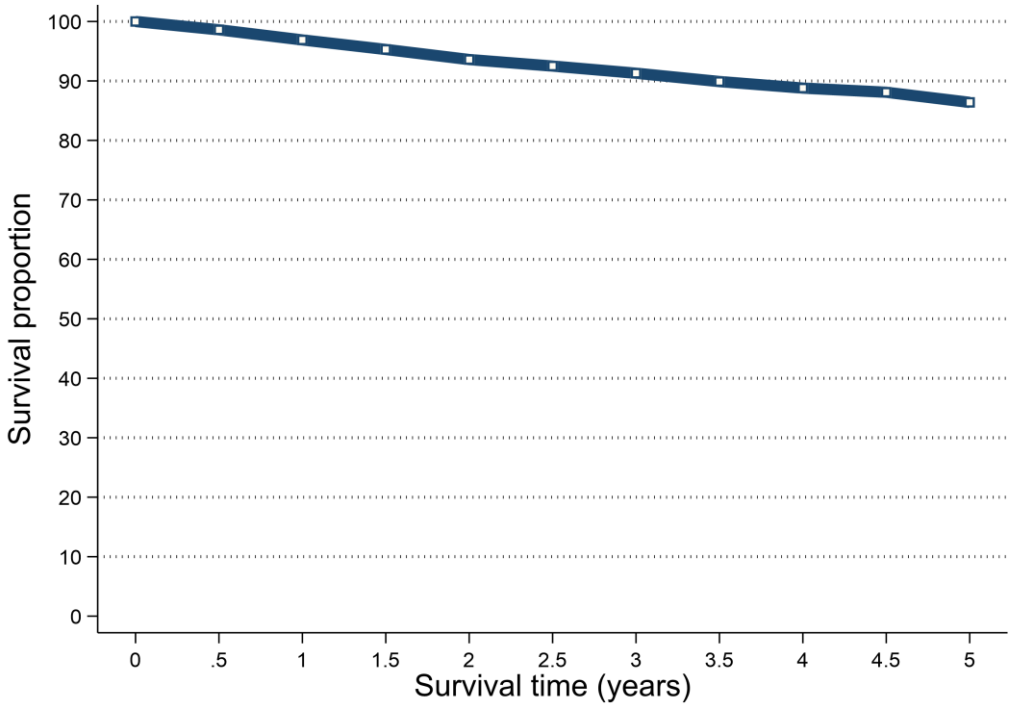
SURVIVAL

- 93.3% of patients were alive one year and 72.0% were alive five years from a prostate cancer diagnosis in 2012-2016. (observed survival)
- Age-standardised net survival (ASNS), which removes the effect of deaths from causes unrelated to cancer, was 96.9% one year and 86.4% five years from a prostate cancer diagnosis in 2012-2016.

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

Time since diagnosis	Male	
	Observed survival	Age-standardised net survival
6 months	96.7%	98.6%
One year	93.3%	96.9%
Two years	86.9%	93.6%
Five years	72.0%	86.4%

Figure 12: Age-standardised net survival from prostate 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.

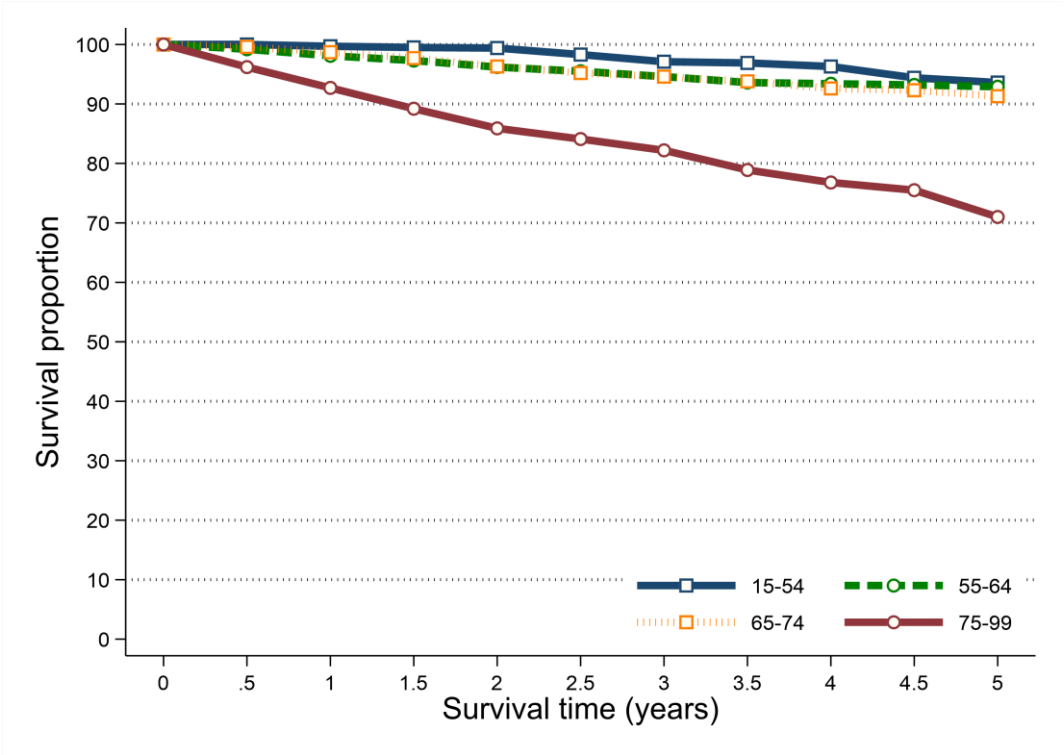
SURVIVAL BY AGE

- Survival from prostate 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 93.6% among patients aged 15 to 54 at diagnosis to 71.0% among those aged 75 to 99.

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

Age group	Male	
	One-year	Five-years
15 to 54	99.7%	93.6%
55 to 64	98.1%	92.9%
65 to 74	98.7%	91.3%
75 to 99	92.7%	71.0%

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

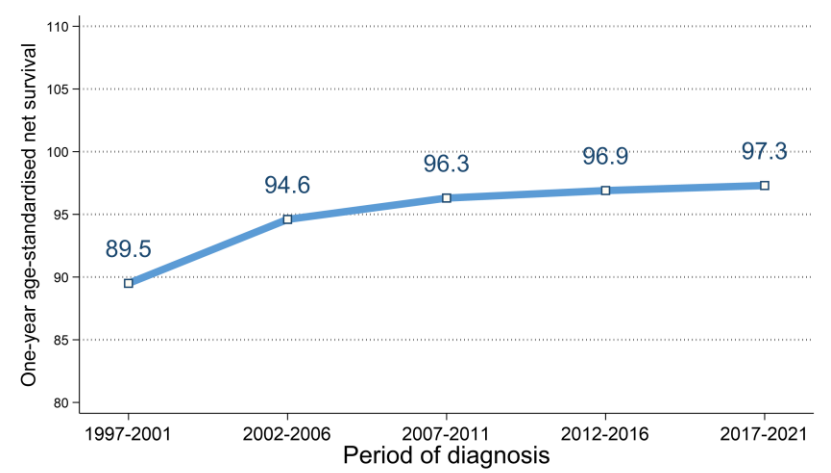


SURVIVAL TRENDS

ONE-YEAR NET SURVIVAL

- Between 2012-2016 and 2017-2021 there was no significant change in one-year survival (ASNS) from prostate cancer among males.
- Compared to 1997-2001 one-year survival (ASNS) from prostate cancer among males in 2017-2021 increased significantly from 89.5% to 97.3%.

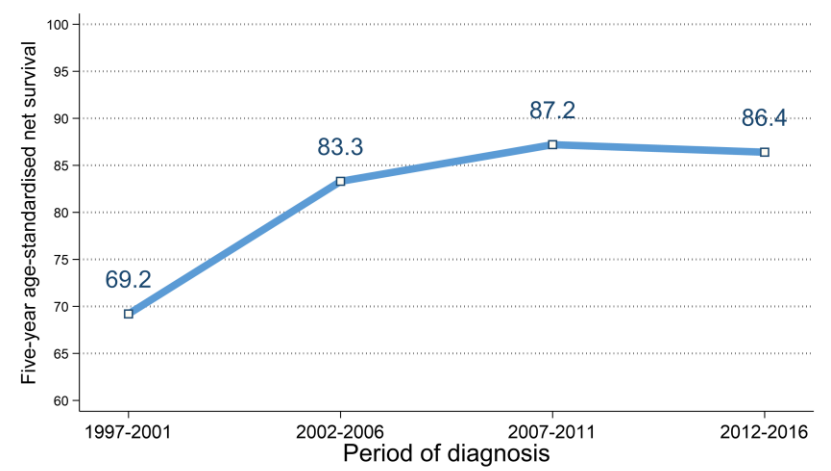
Figure 14: Trends in one-year age-standardised net survival from prostate cancer in 1997-2021



FIVE-YEAR NET SURVIVAL

- Between 2007-2011 and 2012-2016 there was no significant change in five-year survival (ASNS) from prostate cancer among males.
- Compared to 1997-2001 five-year survival (ASNS) from prostate cancer among males in 2012-2016 increased significantly from 69.2% to 86.4%.

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



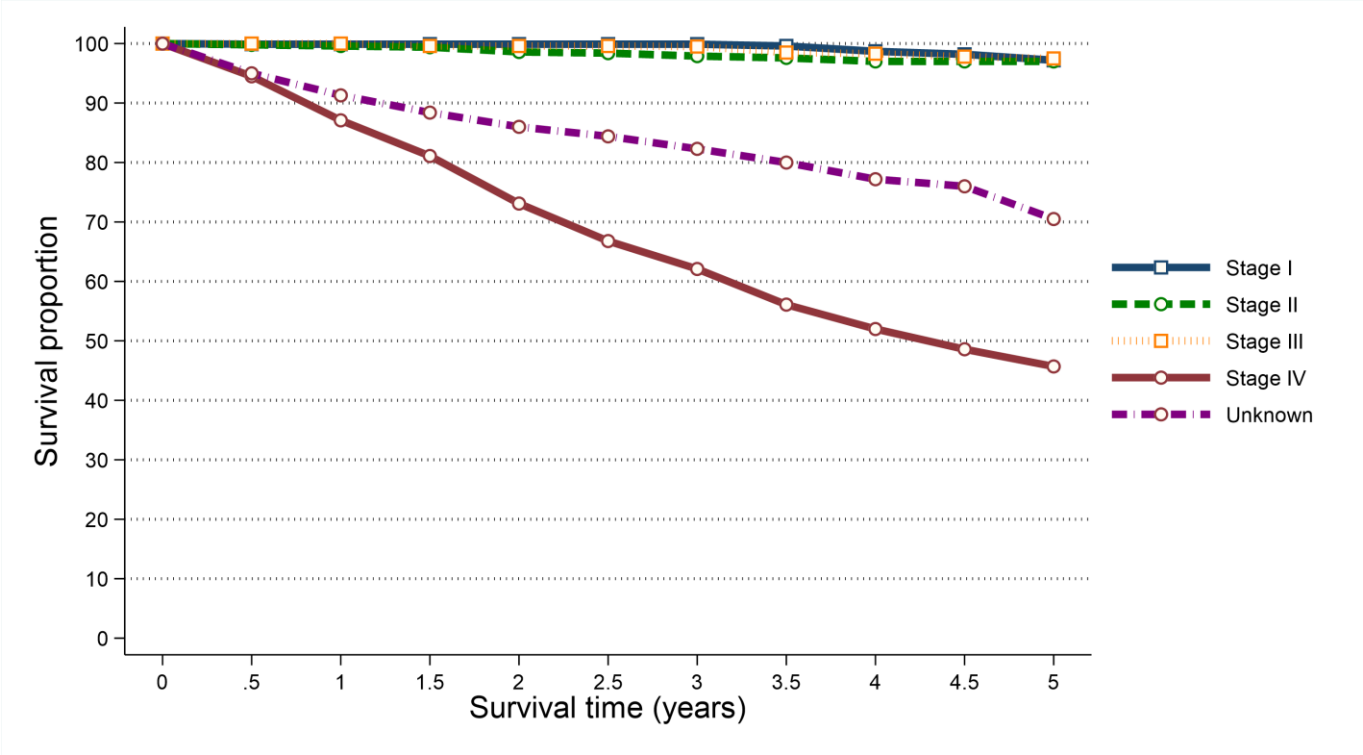
SURVIVAL BY STAGE

- Survival from prostate 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 97.5% among patients diagnosed at Stage III to 45.7% among those diagnosed at Stage IV.

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

Stage at diagnosis	Male	
	One-year	Five-years
Stage I	99.9%	97.2%
Stage II	99.6%	97.0%
Stage III	100.0%	97.5%
Stage IV	87.1%	45.7%
Unknown	91.3%	70.5%

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



PREVALENCE

- At the end of 2021, there were 12,654 males living with prostate cancer who had been diagnosed with the disease during 1997-2021.
- Of these 10.7% had been diagnosed in the previous year (one-year prevalence) and 71.9% in the previous 10 years (ten-year prevalence).
- 50.6% of prostate cancer survivors were aged 75 and over at the end of 2021.

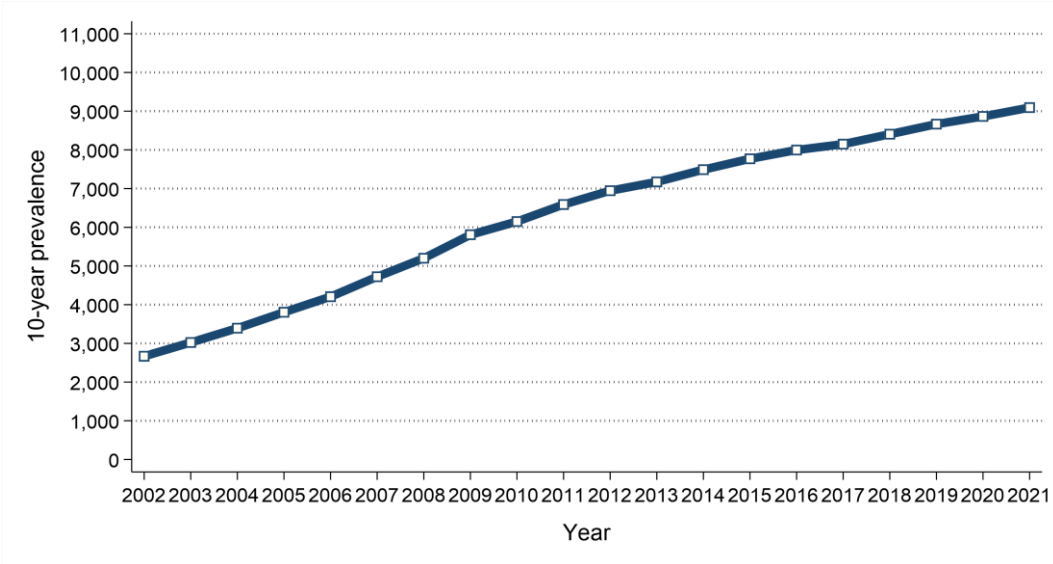
Table 9: 25-year prevalence of prostate cancer by age at end of 2021

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 ages	12,654	1,359	4,206	3,528	3,561
0 to 74	6,253	851	2,532	1,800	1,070
75 and over	6,401	508	1,674	1,728	2,491

PREVALENCE TRENDS

- 10-year prevalence of prostate cancer among males increased between 2016 and 2021 by 13.7% from 7,997 survivors to 9,093 survivors.

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



Year	10-year prevalence Males
2012	6,945
2013	7,173
2014	7,489
2015	7,770
2016	7,997
2017	8,148
2018	8,406
2019	8,666
2020	8,864
2021	9,093

MORTALITY

- There were 1,443 deaths from prostate cancer during 2017-2021 in Northern Ireland. On average this was 289 deaths per year.
- Prostate cancer deaths made up 12.2% of all male cancer deaths.
- The median age of males who died from prostate cancer during 2017-2021 was 81 years.
- The risk of dying from prostate cancer varied by age, with 72.8% of men who died from prostate cancer aged 75 and over at death.
- In contrast, 0.6% of men who died from prostate cancer were aged 0 to 54 at death.

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

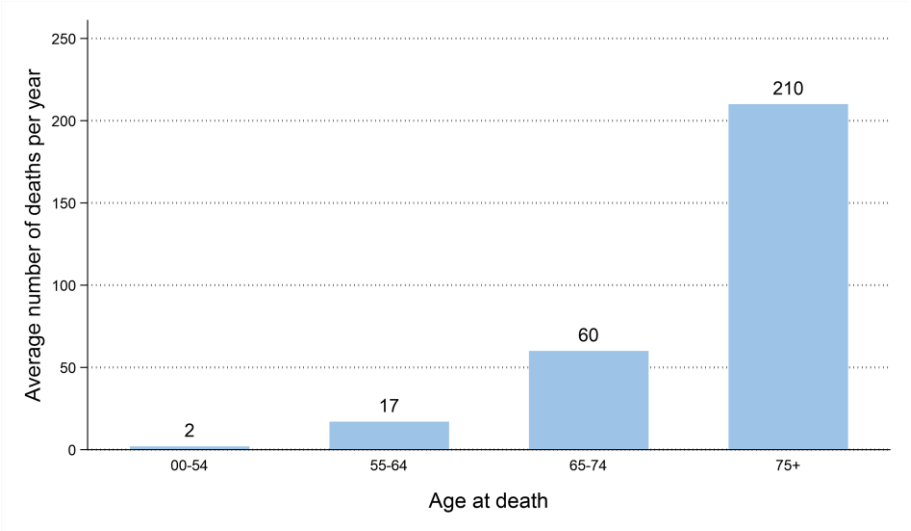
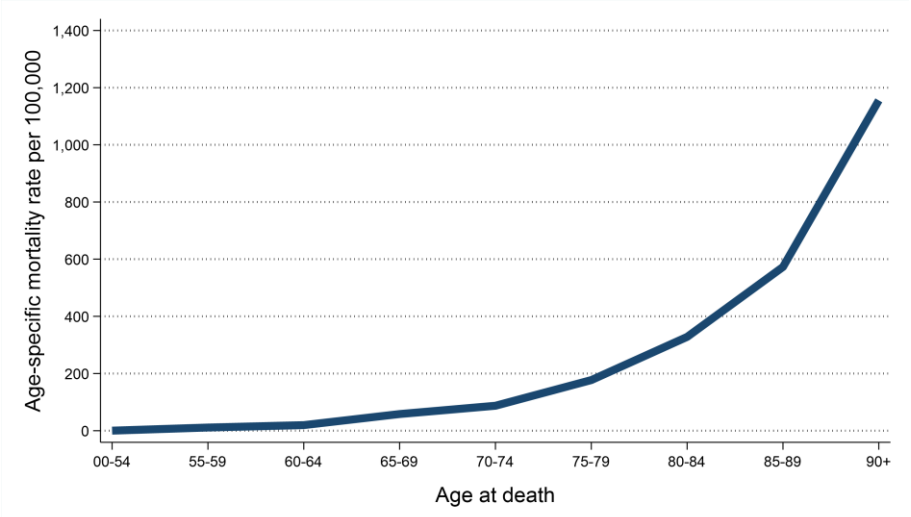


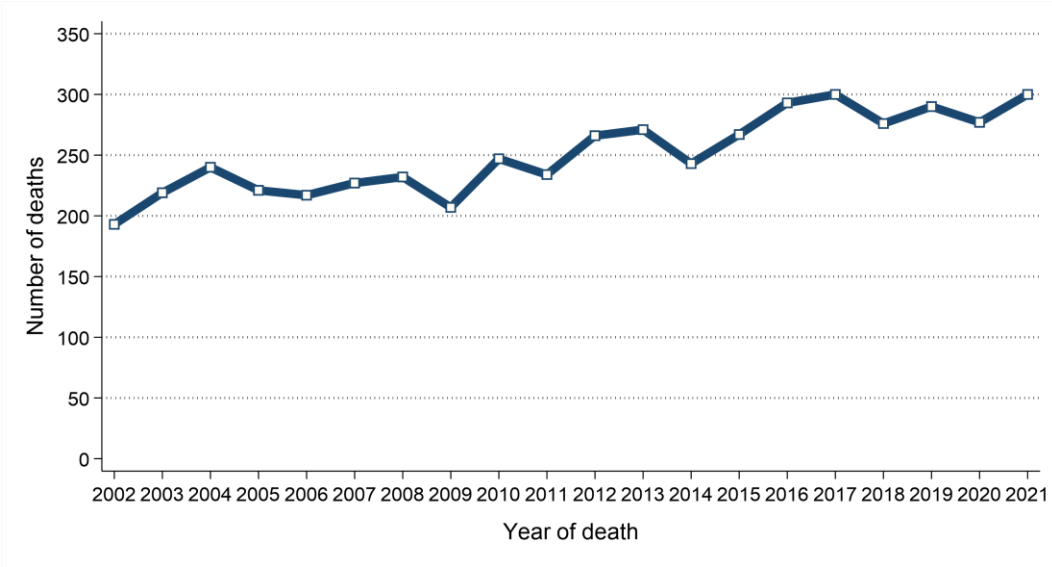
Figure 19: Age-specific mortality rates of prostate cancer in 2017-2021



MORTALITY TRENDS

- The number of deaths from prostate cancer among males increased between 2012-2016 and 2017-2021 by 7.7% from 1,340 deaths (268 deaths per year) to 1,443 deaths (289 deaths per year).

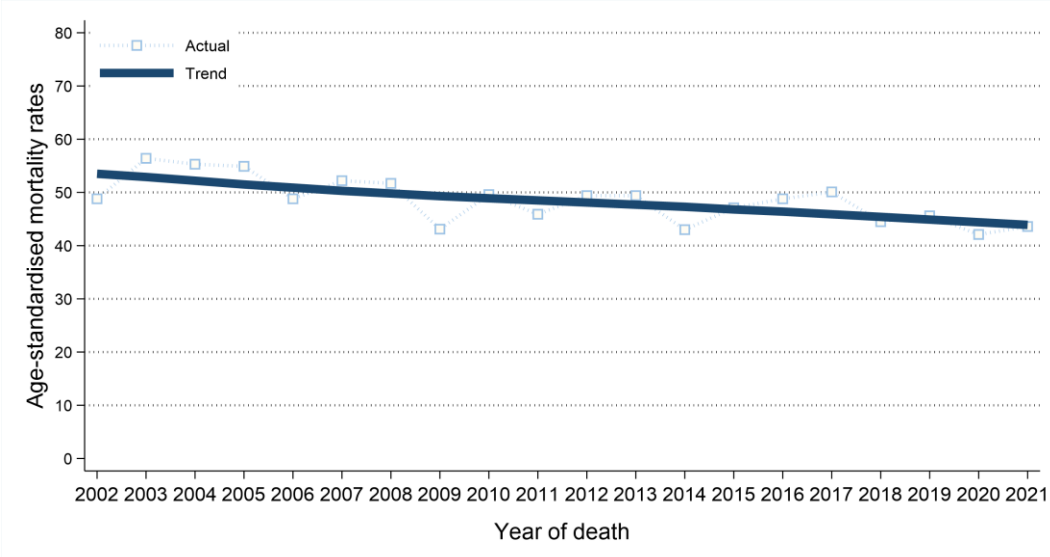
Figure 20: Trends in the number of deaths from prostate cancer from 2002 to 2021



Year of death	Number of deaths Males
2012	266
2013	271
2014	243
2015	267
2016	293
2017	300
2018	276
2019	290
2020	277
2021	300

- Male age-standardised prostate cancer mortality rates decreased between 2012-2016 and 2017-2021 by 5.3% from 47.6 to 45.1 deaths per 100,000 males. This change was not statistically significant.

Figure 21: Trends in mortality rates of prostate 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. 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. prostate 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.