Kidney cancer

1993-2021

(ICD10 codes: C64)

Northern Ireland Cancer Registry, 2024

An official statistics publication

ABOUT THIS REPORT

Contents

This report includes information on incidence of kidney 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. Kidney 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

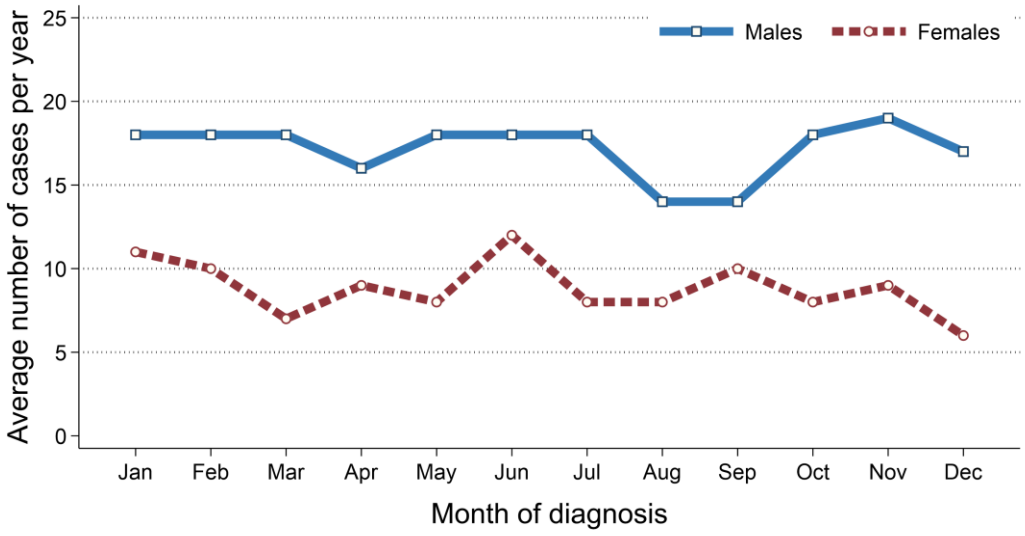
The Northern Ireland Cancer Registry (NICR) uses data provided by patients and collected by the health service as part of their care and support.

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

INCIDENCE

- There were 1,561 cases of kidney cancer diagnosed during 2017-2021 in Northern Ireland. On average this was 312 cases per year.
- During this period 34.4% of kidney cancer cases were among women (Male cases: 1,024, Female cases: 537). On average there were 205 male and 107 female cases of kidney cancer per year.
- The most common diagnosis month during 2017-2021 was November among males with 19 cases per year and June among females with 12 cases per year.

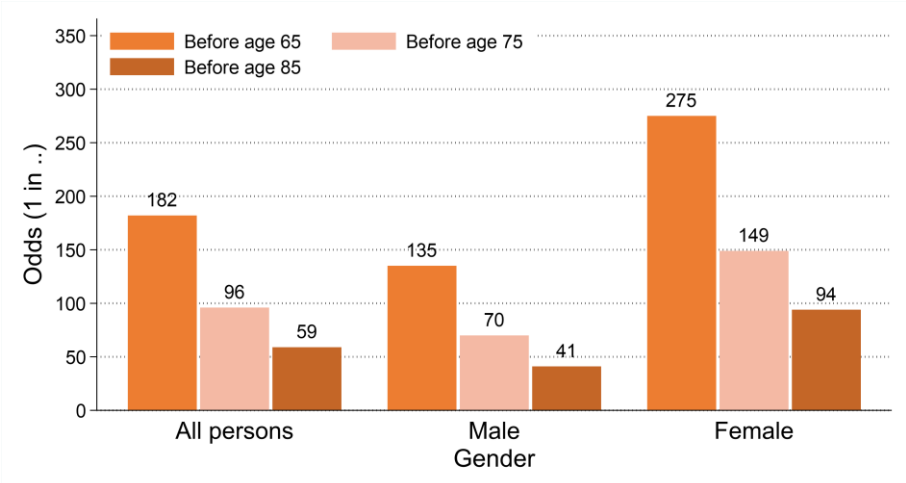
Figure 1: Average number of cases of kidney cancer per year in 2017-2021 by month of diagnosis



Month of diagnosis	Average number of cases per year	
	Males	Females
January	18	11
February	18	10
March	18	7
April	16	9
May	18	8
June	18	12
July	18	8
August	14	8
September	14	10
October	18	8
November	19	9
December	17	6

- Kidney cancer made up 4.0% of all male and 2.2% of all female cancer cases (excluding non-melanoma skin cancer).
- The kidney cancer incidence rates for each gender were 22.0 cases per 100,000 males and 11.2 cases per 100,000 females.
- The odds of developing kidney cancer before age 85 was 1 in 41 for men and 1 in 94 for women.

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



INCIDENCE BY AGE

- The median age of patients diagnosed with kidney cancer during 2017-2021 was 68 years (Males: 67, Females: 69).
- The risk of developing kidney cancer varied by age, with 29.3% of men and 33.5% of women diagnosed with kidney cancer aged 75 and over at diagnosis.
- In contrast, 18.4% of patients diagnosed with kidney cancer were aged 0 to 54 at diagnosis.

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

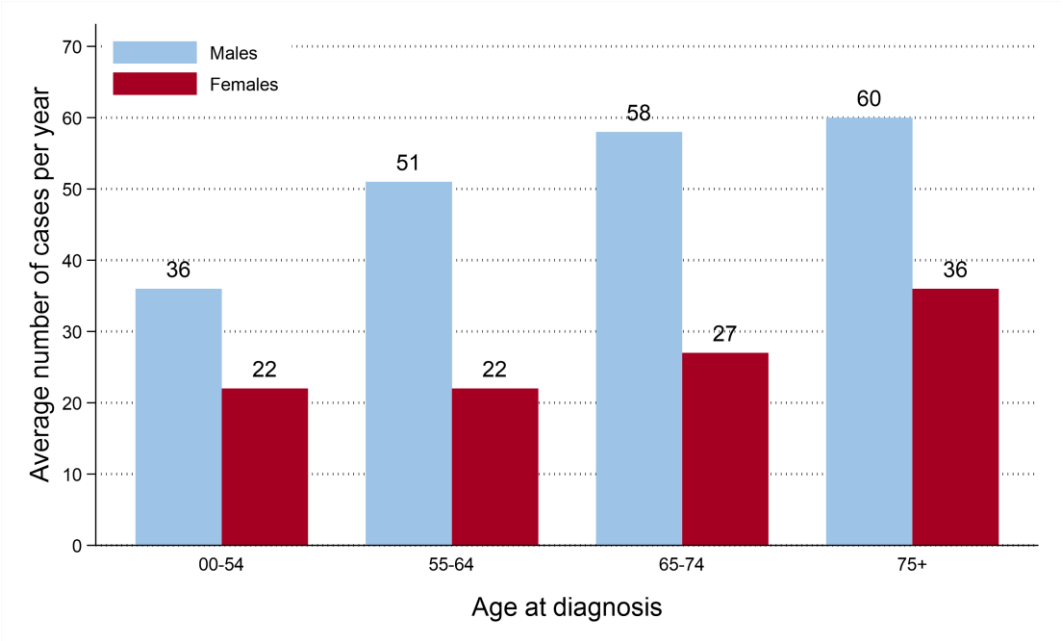
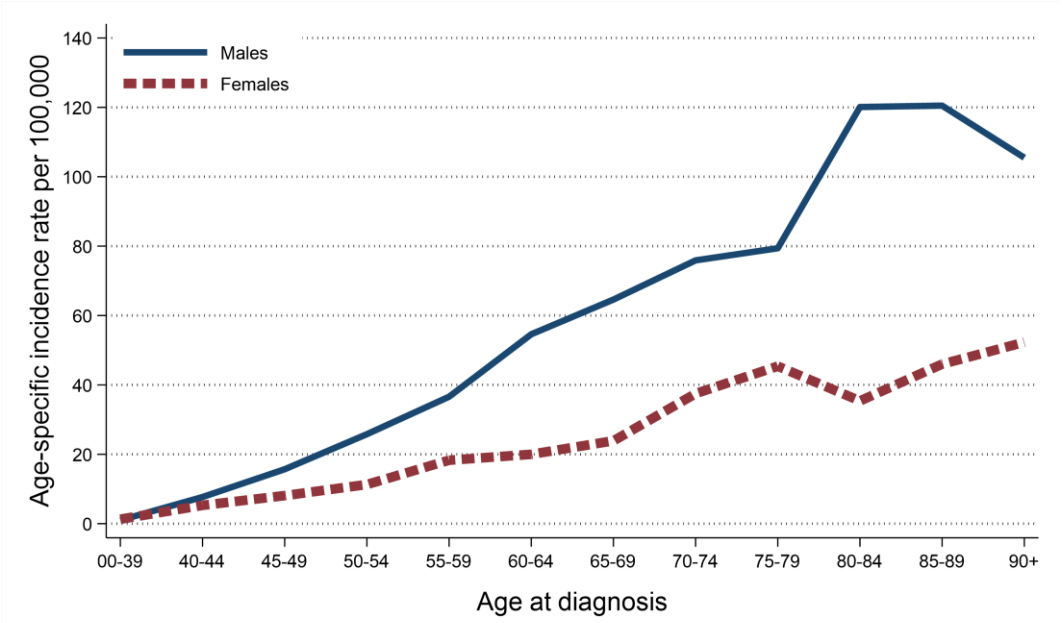


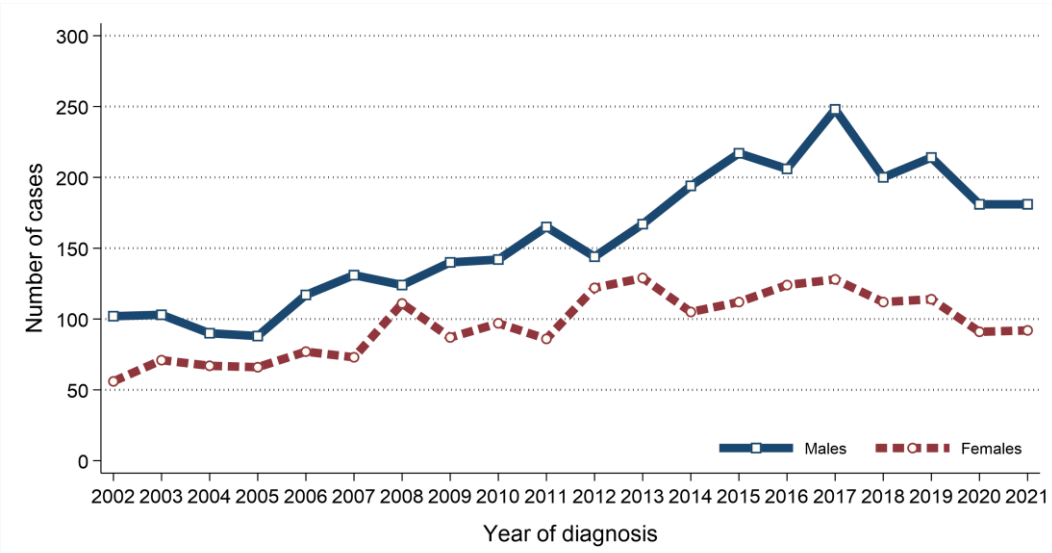
Figure 4: Age-specific incidence rates of kidney cancer in 2017-2021



INCIDENCE TRENDS

- The number of cases of kidney cancer among males increased between 2012-2016 and 2017-2021 by 10.3% from 928 cases (186 cases per year) to 1,024 cases (205 cases per year).
- The number of cases of kidney cancer among females decreased between 2012-2016 and 2017-2021 by 9.3% from 592 cases (118 cases per year) to 537 cases (107 cases per year).

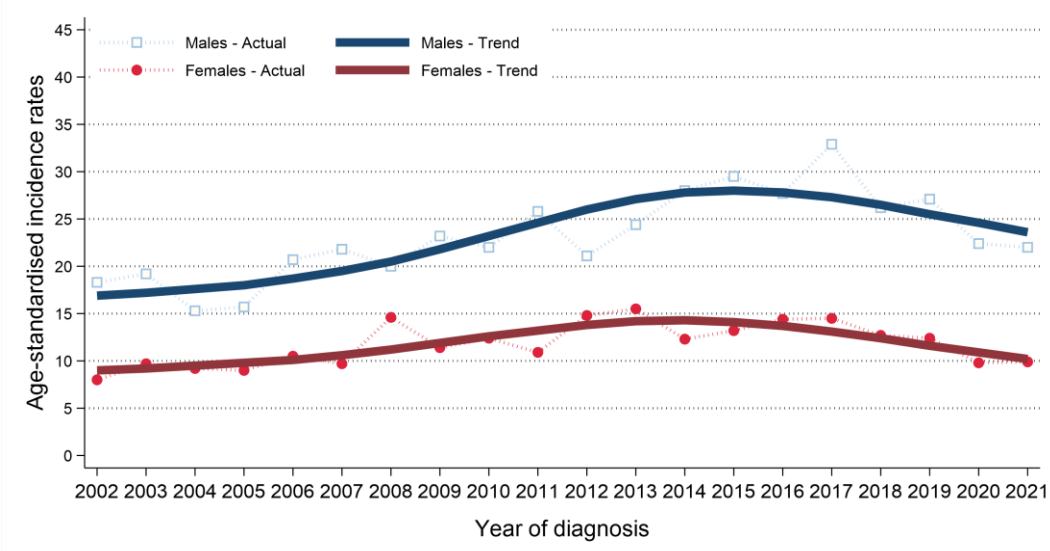
Figure 5: Trends in number of cases of kidney cancer diagnosed from 2002 to 2021



Year of diagnosis	Number of cases	
	Males	Females
2012	144	122
2013	167	129
2014	194	105
2015	217	112
2016	206	124
2017	248	128
2018	200	112
2019	214	114
2020	181	91
2021	181	92

- Male age-standardised kidney cancer incidence rates decreased between 2012-2016 and 2017-2021 by 0.8% from 26.2 to 26.0 cases per 100,000 males. This change was not statistically significant.
- Female age-standardised kidney cancer incidence rates decreased between 2012-2016 and 2017-2021 by 15.7% from 14.0 to 11.8 cases per 100,000 females. This change was statistically significant.

Figure 6: Trends in incidence rates of kidney 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).

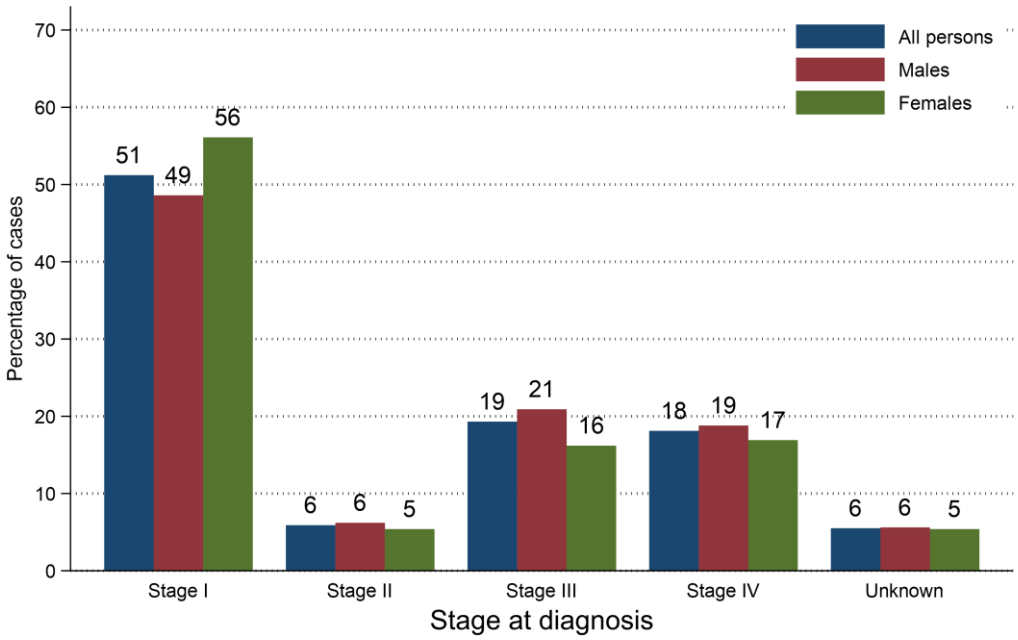
INCIDENCE BY STAGE AT DIAGNOSIS

- During 2017-2021 94.5% of kidney cancer cases had a stage assigned.
- 51.2% of kidney cancer cases were diagnosed at Stage I. (54.2% of staged cases)
- 18.1% of kidney cancer cases were diagnosed at Stage IV. (19.2% of staged cases)

Table 1: Number of cases of kidney cancer diagnosed in 2017-2021 by stage at diagnosis

Stage at diagnosis	All persons		Male		Female	
	Total cases in period	Average cases per year	Total cases in period	Average cases per year	Total cases in period	Average cases per year
All stages	**1,561**	**312**	**1,024**	**205**	**537**	**107**
	.	.	.	.	.	.
Stage I	799	160	498	100	301	60
Stage II	92	18	63	13	29	6
Stage III	301	60	214	43	87	17
Stage IV	283	57	192	38	91	18
Unknown	86	17	57	11	29	6

Figure 7: Proportion of cases of kidney 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).

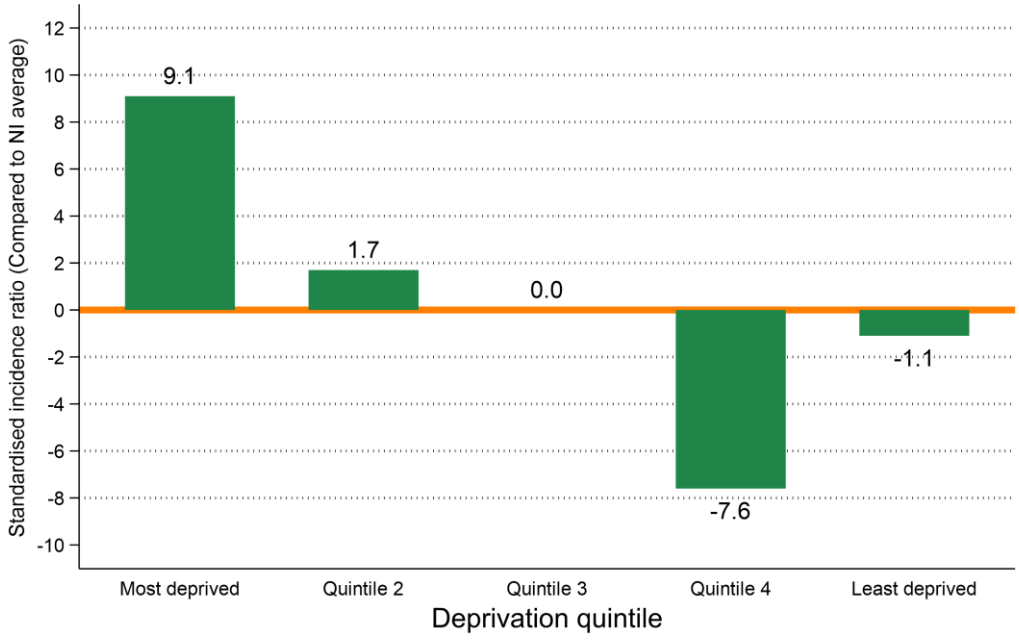
INCIDENCE BY DEPRIVATION

- The number of cases of kidney 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 did not vary significantly from the NI average.
  - in the least socio-economically deprived areas did not vary significantly from the NI average.

Table 2: Number of cases of kidney cancer diagnosed in 2017-2021 by deprivation quintile

Deprivation quintile	All persons		Male		Female	
	Total cases in period	Average cases per year	Total cases in period	Average cases per year	Total cases in period	Average cases per year
Northern Ireland	**1,561**	**312**	**1,024**	**205**	**537**	**107**
	.	.	.	.	.	.
Most deprived	282	56	173	35	109	22
Quintile 2	318	64	217	43	101	20
Quintile 3	328	66	212	42	116	23
Quintile 4	307	61	207	41	100	20
Least deprived	326	65	215	43	111	22
Unknown	0	0	0	0	0	0

Figure 8: Standardised incidence ratio comparing deprivation quintile to Northern Ireland for kidney 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.

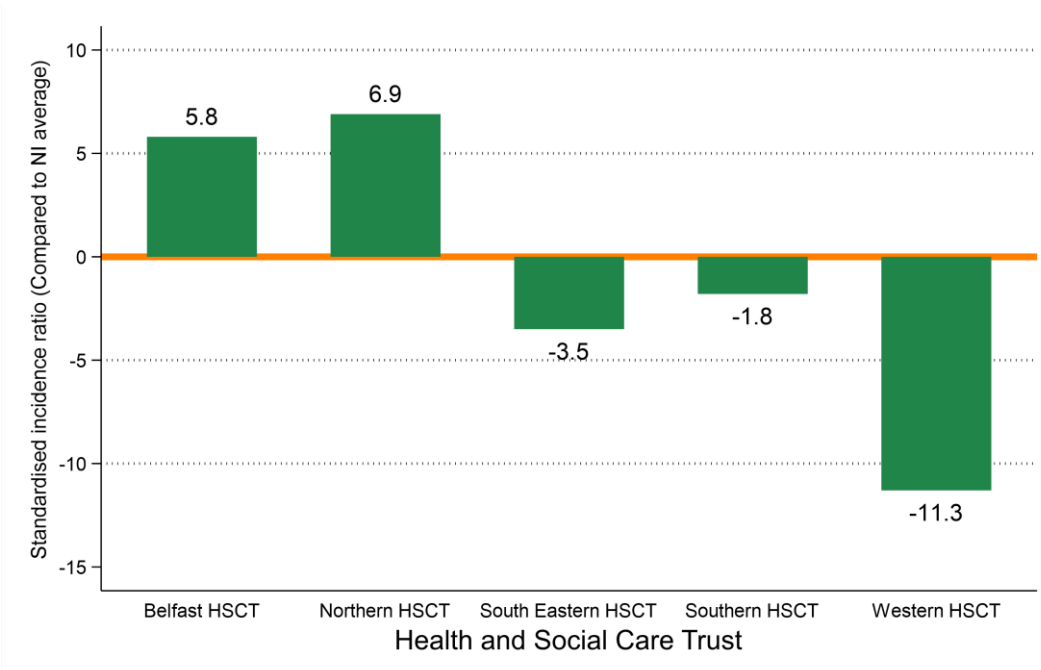
INCIDENCE BY HEALTH AND SOCIAL CARE TRUST

- The number of cases of kidney 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 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.

Table 3: Number of cases of kidney cancer diagnosed in 2017-2021 by Health and Social Care Trust

Health and Social Care Trust	All persons		Male		Female	
	Total cases in period	Average cases per year	Total cases in period	Average cases per year	Total cases in period	Average cases per year
Northern Ireland	**1,561**	**312**	**1,024**	**205**	**537**	**107**
	.	.	.	.	.	.
Belfast HSCT	297	59	179	36	118	24
Northern HSCT	442	88	281	56	161	32
South Eastern HSCT	315	63	216	43	99	20
Southern HSCT	290	58	199	40	91	18
Western HSCT	217	43	149	30	68	14
Unknown	0	0	0	0	0	0

Figure 9: Standardised incidence ratio comparing Health and Social Care Trust to Northern Ireland for kidney cancer diagnosed in 2017-2021



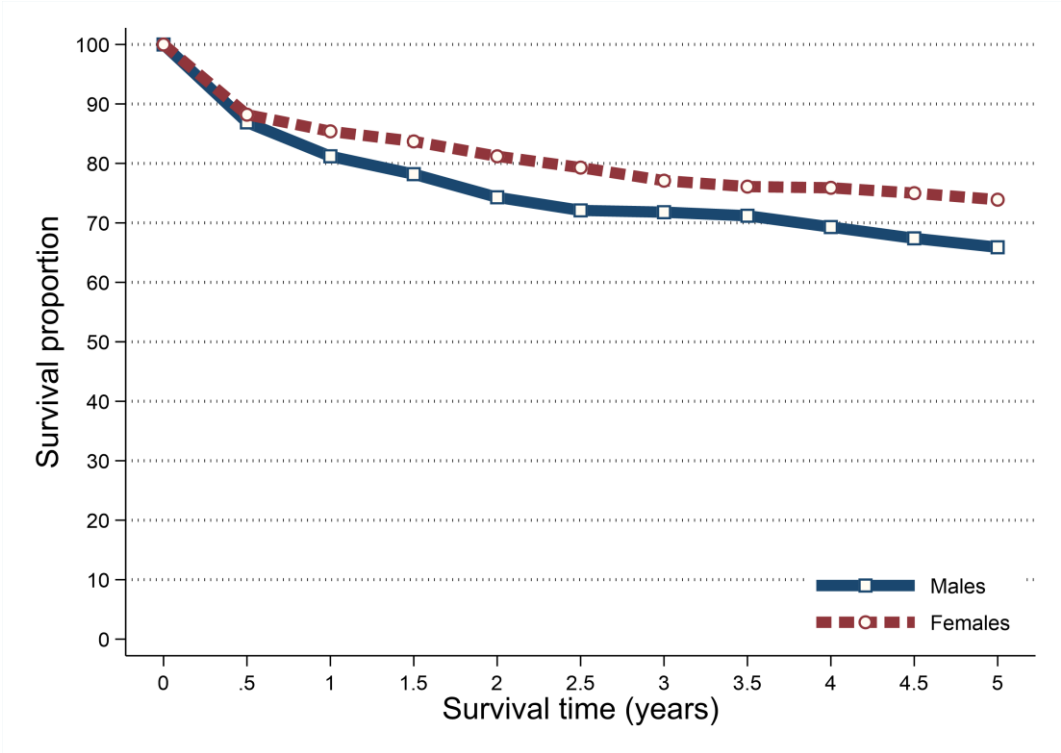
SURVIVAL

- 80.7% of patients were alive one year and 60.4% were alive five years from a kidney cancer diagnosis in 2012-2016. (observed survival)
- Age-standardised net survival (ASNS), which removes the effect of deaths from causes unrelated to cancer, was 82.8% one year and 69.1% five years from a kidney cancer diagnosis in 2012-2016.
- Five-year survival (ASNS) for kidney cancer patients diagnosed in 2012-2016 was 65.9% among men and 73.9% among women.

Table 4: Survival from kidney cancer for patients diagnosed in 2012-2016

Time since diagnosis	All persons		Male		Female	
	Observed survival	Age-standardised net survival	Observed survival	Age-standardised net survival	Observed survival	Age-standardised net survival
6 months	86.2%	87.4%	85.9%	86.9%	86.6%	88.2%
One year	80.7%	82.8%	79.2%	81.2%	83.0%	85.4%
Two years	73.2%	77.0%	70.8%	74.3%	76.9%	81.2%
Five years	60.4%	69.1%	57.7%	65.9%	64.8%	73.9%

Figure 10: Age-standardised net survival from kidney 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.

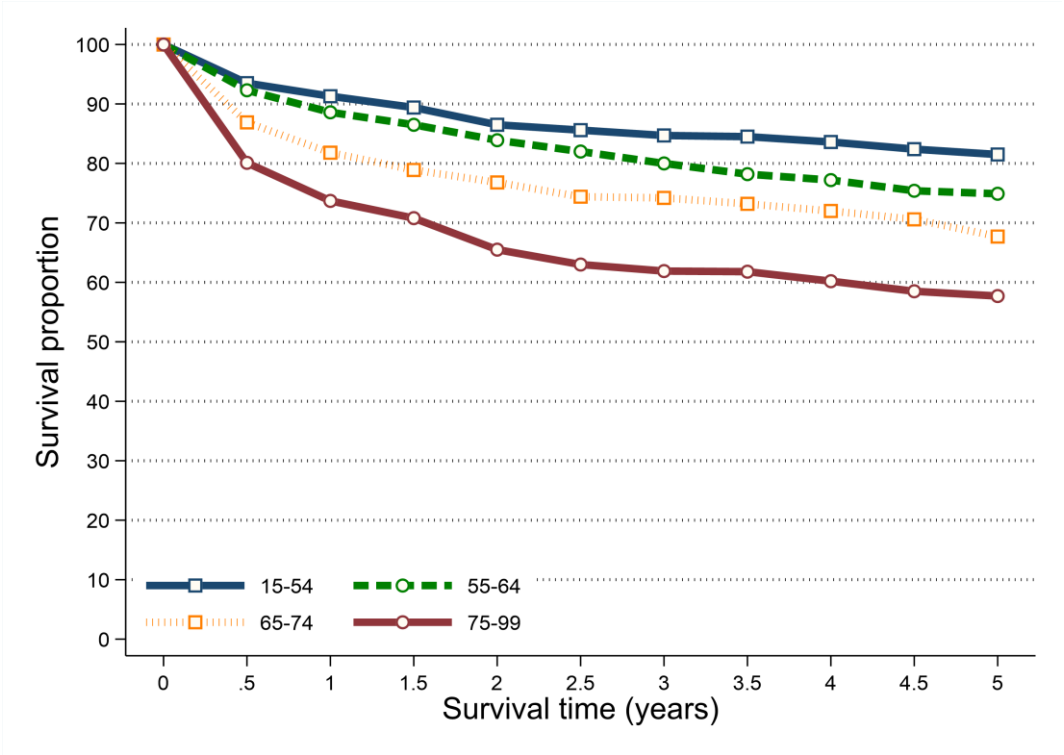
SURVIVAL BY AGE

- Survival from kidney 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 81.5% among patients aged 15 to 54 at diagnosis to 57.7% among those aged 75 to 99.

Table 5: Net survival from kidney cancer for patients diagnosed in 2012-2016 by age at diagnosis

Age group	All persons	
	One-year	Five-years
15 to 54	91.3%	81.5%
55 to 64	88.6%	74.9%
65 to 74	81.8%	67.7%
75 to 99	73.7%	57.7%

Figure 11: Net survival from kidney cancer for patients diagnosed in 2012-2016 by age at diagnosis

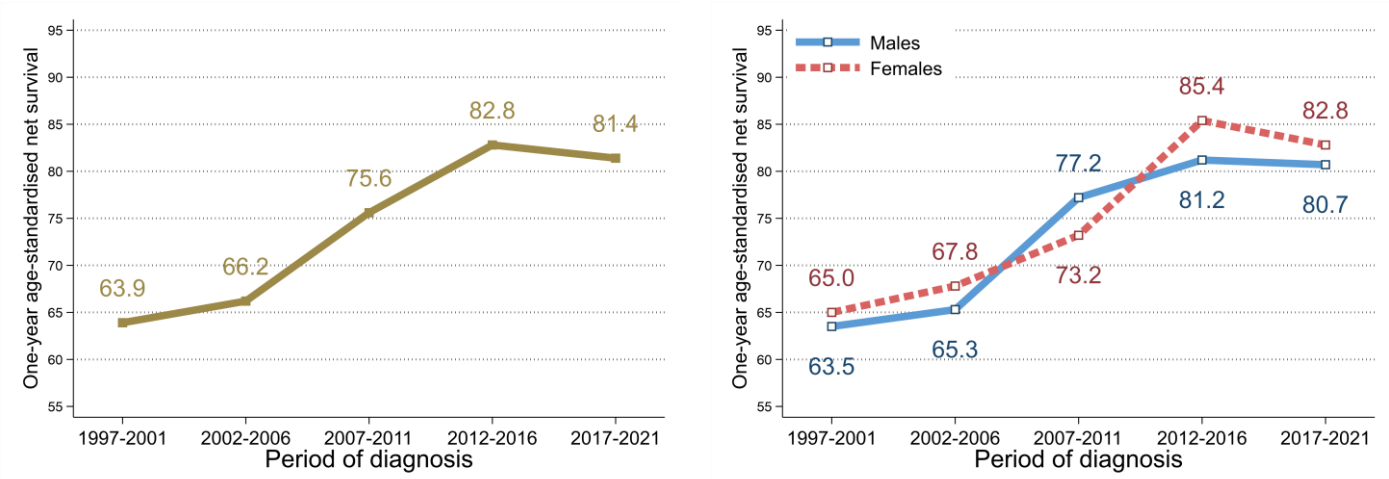


SURVIVAL TRENDS

ONE-YEAR NET SURVIVAL

- Between 2012-2016 and 2017-2021 there was no significant change in one-year survival (ASNS) from kidney cancer.
- Compared to 1997-2001 one-year survival (ASNS) from kidney cancer in 2017-2021 increased significantly from 63.9% to 81.4%. This increase was significant for males (63.5% to 80.7%) and females (65.0% to 82.8%).

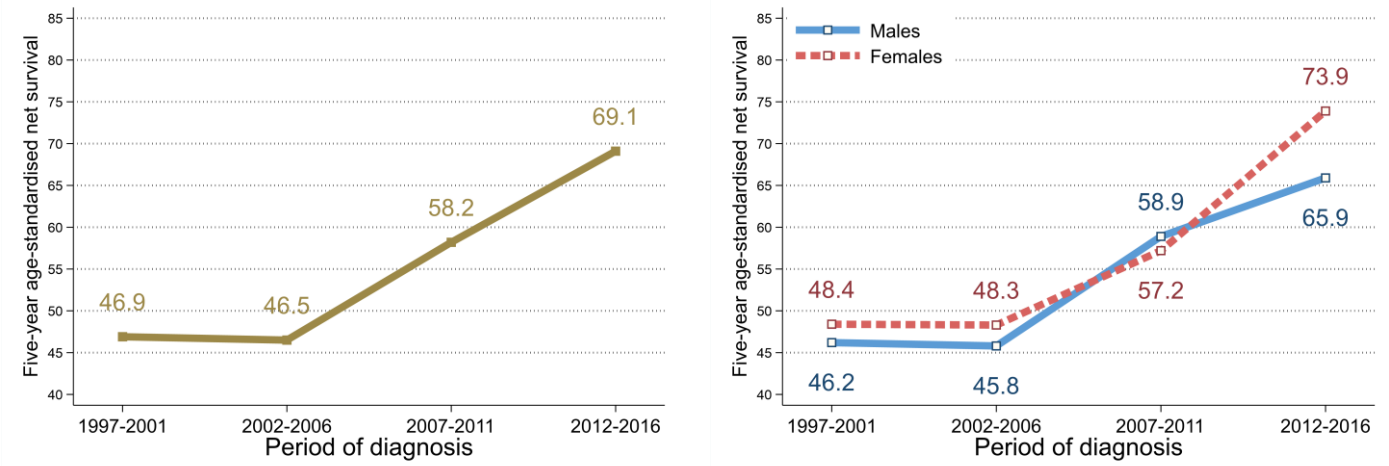
Figure 12: Trends in one-year age-standardised net survival from kidney cancer in 1997-2021



FIVE-YEAR NET SURVIVAL

- Between 2007-2011 and 2012-2016 there was a significant increase from 58.2% to 69.1% in five-year survival (ASNS) from kidney cancer. This increase was significant for females (57.2% to 73.9%) but not males.
- Compared to 1997-2001 five-year survival (ASNS) from kidney cancer in 2012-2016 increased significantly from 46.9% to 69.1%. This increase was significant for males (46.2% to 65.9%) and females (48.4% to 73.9%).

Figure 13: Trends in five-year age-standardised net survival from kidney cancer in 1997-2016



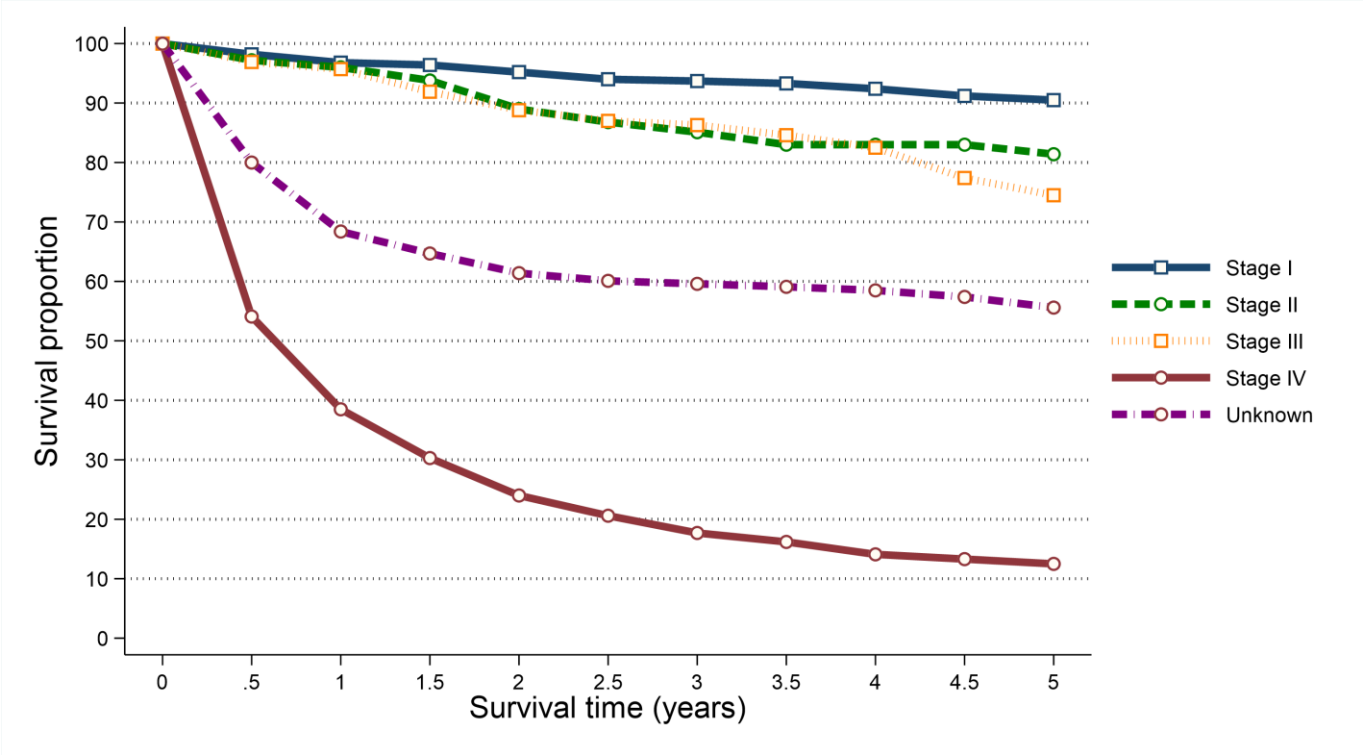
SURVIVAL BY STAGE

- Survival from kidney 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 90.5% among patients diagnosed at Stage I to 12.5% among those diagnosed at Stage IV.

Table 6: Age-standardised net survival from kidney cancer for patients diagnosed in 2012-2016 by stage at diagnosis

Stage at diagnosis	All persons	
	One-year	Five-years
Stage I	96.8%	90.5%
Stage II	96.0%	81.4%
Stage III	95.7%	74.5%
Stage IV	38.5%	12.5%
Unknown	68.4%	55.6%

Figure 14: Age-standardised net survival from kidney cancer for patients diagnosed in 2012-2016 by stage at diagnosis



PREVALENCE

- At the end of 2021, there were 2,480 people (Males: 1,496; Females: 984) living with kidney cancer who had been diagnosed with the disease during 1997-2021.
- Of these 9.1% had been diagnosed in the previous year (one-year prevalence) and 75.0% in the previous 10 years (ten-year prevalence).
- 34.3% of kidney cancer survivors were aged 75 and over at the end of 2021.

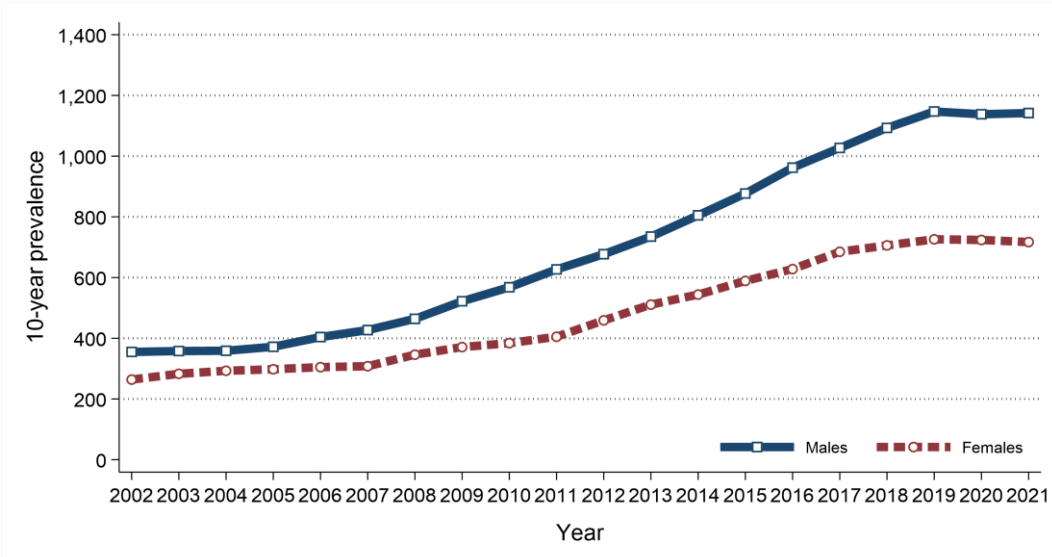
Table 7: 25-year prevalence of kidney cancer by age at end of 2021

Gender	Age at end of 2021	25-year prevalence	Time since diagnosis			
			0 to 1 year	1 to 5 years	5 to 10 years	10 to 25 years
All persons	All ages	2,480	226	852	781	621
	0 to 74	1,629	170	595	523	341
	75 and over	851	56	257	258	280
Male	All ages	1,496	150	540	452	354
	0 to 74	1,028	120	388	316	204
	75 and over	468	30	152	136	150
Female	All ages	984	76	312	329	267
	0 to 74	601	50	207	207	137
	75 and over	383	26	105	122	130

PREVALENCE TRENDS

- 10-year prevalence of kidney cancer among males increased between 2016 and 2021 by 18.7% from 962 survivors to 1,142 survivors.
- 10-year prevalence of kidney cancer among females increased between 2016 and 2021 by 14.2% from 628 survivors to 717 survivors.

Figure 15: Trends in 10-year prevalence of kidney cancer in 2002-2021



Year	10-year prevalence	
	Males	Females
2012	677	459
2013	735	511
2014	805	544
2015	877	589
2016	962	628
2017	1,027	685
2018	1,093	706
2019	1,147	726
2020	1,138	724
2021	1,142	717

MORTALITY

- There were 565 deaths from kidney cancer during 2017-2021 in Northern Ireland. On average this was 113 deaths per year.
- During this period 32.4% of kidney cancer deaths were among women (Male deaths: 382, Female deaths: 183). On average there were 76 male and 37 female deaths from kidney cancer per year.
- Kidney cancer deaths made up 3.2% of all male cancer deaths and 1.7% of all female cancer deaths.
- The median age of patients who died from kidney cancer during 2017-2021 was 74 years (Males: 74, Females: 77).
- The risk of dying from kidney cancer varied by age, with 46.9% of men and 54.6% of women who died from kidney cancer aged 75 and over at death.
- In contrast, 8.5% of patients who died from kidney cancer were aged 0 to 54 at death.

Figure 16: Average number of deaths from kidney cancer per year in 2017-2021 by age at death

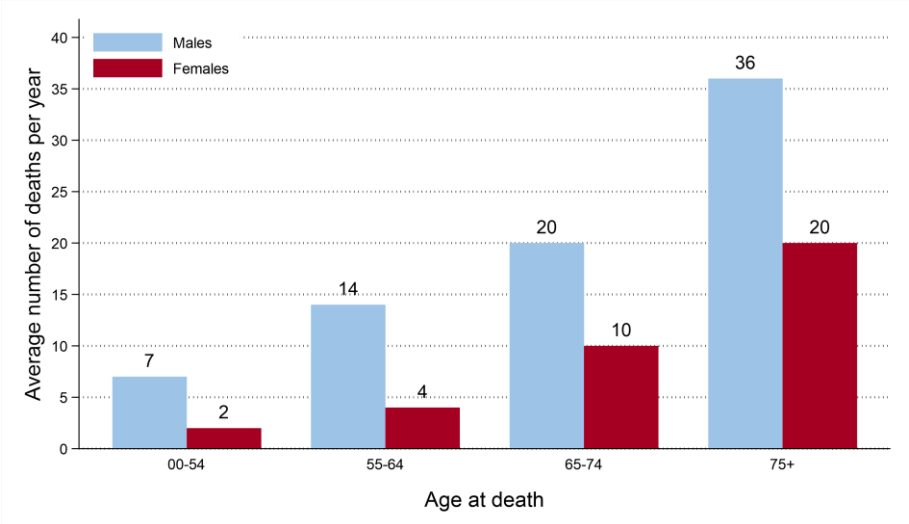
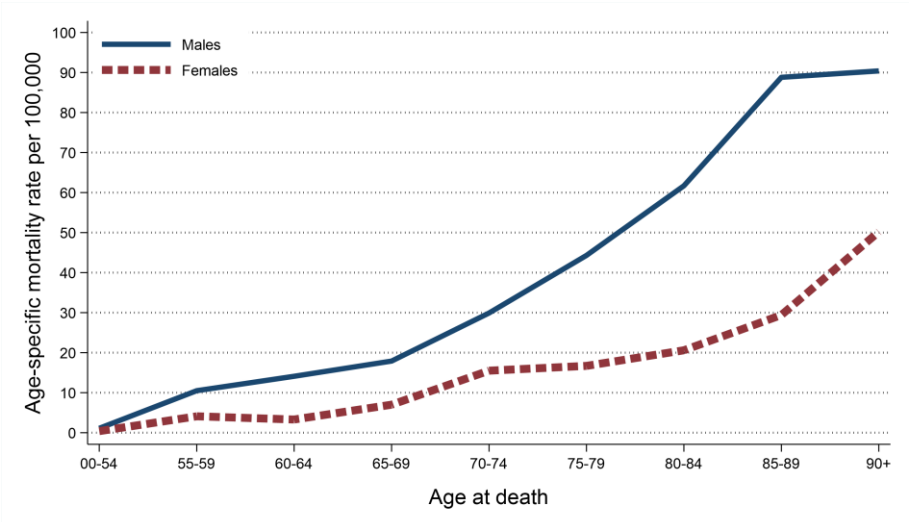


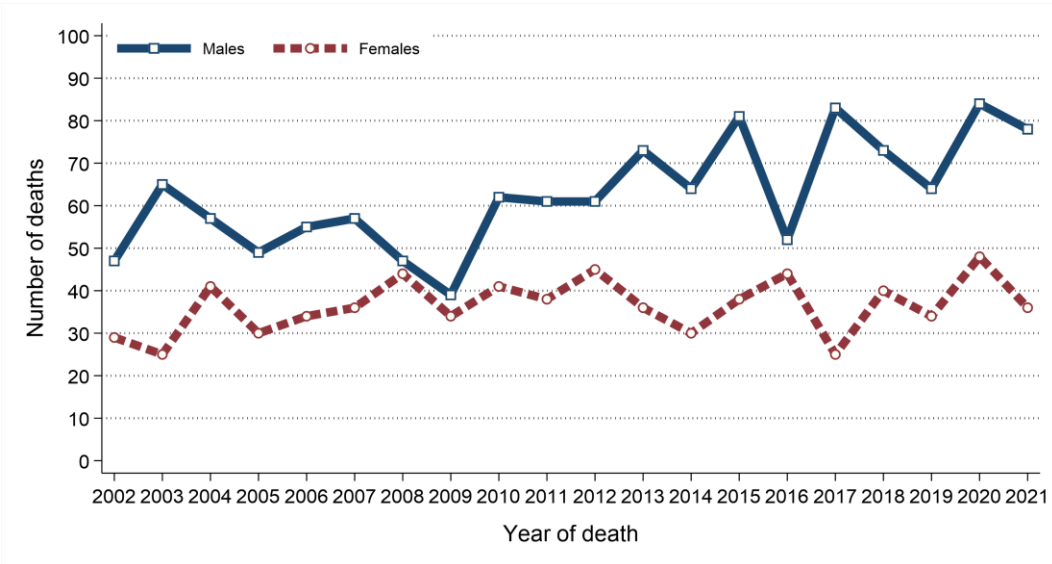
Figure 17: Age-specific mortality rates of kidney cancer in 2017-2021



MORTALITY TRENDS

- The number of deaths from kidney cancer among males increased between 2012-2016 and 2017-2021 by 15.4% from 331 deaths (66 deaths per year) to 382 deaths (76 deaths per year).
- The number of deaths from kidney cancer among females decreased between 2012-2016 and 2017-2021 by 5.2% from 193 deaths (39 deaths per year) to 183 deaths (37 deaths per year).

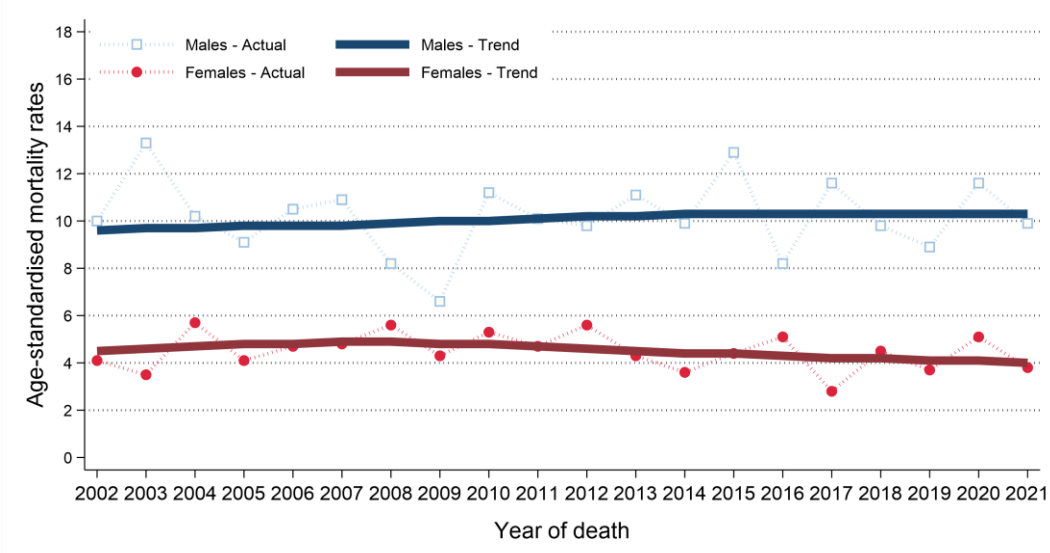
Figure 18: Trends in the number of deaths from kidney cancer from 2002 to 2021



Year of death	Number of deaths	
	Males	Females
2012	61	45
2013	73	36
2014	64	30
2015	81	38
2016	52	44
2017	83	25
2018	73	40
2019	64	34
2020	84	48
2021	78	36

- Male age-standardised kidney cancer mortality rates did not change between 2012-2016 and 2017-2021 with 10.4 deaths per 100,000 males in each period of time.
- Female age-standardised kidney cancer mortality rates decreased between 2012-2016 and 2017-2021 by 13.0% from 4.6 to 4.0 deaths per 100,000 females. This change was not statistically significant.

Figure 19: Trends in mortality rates of kidney 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. kidney 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. kidney 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.