National Cancer Registry Ireland

CANCER IN IRELAND 1994-2022

ANNUAL STATISTICAL REPORT OF THE NATIONAL CANCER REGISTRY

2024

www.ncri.ie

ABBREVIATIONS	
95% CI	95% confidence interval
95% PI	95% prediction interval
APC	Annual percentage change
ASR	Age-standardised rate
CNS	Central nervous system
CSO	Central Statistics Office
ESP	European Standard Population
HPV	Human papillomavirus
IARC	International Agency for Research on Cancer
ICD	International Statistical Classification of Diseases and Related Health Problems
NCCP	National Cancer Control Programme
NCRI	National Cancer Registry Ireland
NHL	Non-Hodgkin lymphoma
NMSC	Non-melanoma skin cancer
NOS	Not otherwise specified
TNM	Tumour, node, metastasis (stage)
WHO	World Health Organisation

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About the National Cancer Registry

The National Cancer Registry was established by the Minister for Health in 1991. It has been collecting comprehensive cancer information for the population of the Republic of Ireland since 1994. This information is used in research into the causes of cancer, in education and information programmes, and in the planning and management of cancer services to deliver the best cancer care to the whole population.

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Acknowledgments

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- The Central Statistics Office and the General Register Office provided access to population and death certificate data.
- The National Cancer Registry is funded by the Department of Health.
- Drafts of this report were circulated to the Department of Health's Cancer, Blood & Organs Policy Unit; the Health Service Executive's National Cancer Control Programme; and the Board, Advisory Council, and Senior Management Team of the National Cancer Registry.

FOREWORD

The National Cancer Registry of Ireland is now in its 31st year of data collection, and in our 2024 annual statistical report, we summarise cancer data collected up to diagnosis year 2022. With the establishment of six new regions within the Health Service Executive, we profile cancer incidence and survival by the new regions for the first time. We also provide updates on the impact of the COVID-19 pandemic on numbers of cancers diagnosed in 2022.

One of the core functions of the NCRI is provide data for cancer service planning, evaluation and policymaking. Previous annual statistical reports have documented differences in cancer incidence and outcomes by geographic regions such as the original health boards and former HSE areas (2002, 2004 and 2008). At the time of writing, the HSE is transitioning towards six new health regions: HSE Dublin and Northeast (DNNE), HSE Dublin and Midlands (DNML), HSE Dublin and South East (DNSE), HSE Mid West (MW), HSE South West (SW) and HSE West and North West (WNW). Each region will be responsible for providing both hospital and community care for the people in that area. The six health regions will be fully established by March 2025. It is hoped that the more detailed cancer statistics presented by the new geographical areas in this report will assist in assessing the population needs. Regional variation in geographical cancer incidence and outcomes can be attributed to a combination of environmental, socioeconomic and healthcare-related factors and underline the importance of targeted public health strategies and equitable healthcare systems as proposed by the Sláintecare initiative.

As reported in the 2022 NCRI annual statistical report [1], for 2020, the first year of the COVID-19 pandemic, the shortfall on projected cases for 2020 was estimated at 10% (10% for males; 10% for females). For 2021, the shortfall on projected cases in 2021 was 4% (7% for males; 1% for females) where registered cases in females fell within the expected range based on pre-2020 trends [2].

For 2022, with registration now essentially complete at the time of writing, the estimated shortfall on projected cases was 2% (2% for males; 3% for females) – well within the projected range for both sexes combined and males, and just marginally below the projected range for females The reductions in cancer diagnoses during 2020 & 2021 are likely a result of pandemic-related impacts on health-seeking behaviour among the public, disruptions to cancer control services and COVID-19 related deaths among people who would otherwise have gone on to be diagnosed with cancer [3].

Professor Deirdre Murray
Director,
National Cancer Registry

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REPORT AT A GLANCE

Who are we, and what do we do?

The National Cancer Registry of Ireland (NCRI) works on behalf of the Department of Health and collects information from all hospitals in Ireland on the number of persons diagnosed with cancer and the types of cancer they have.
NCRI also follows up the numbers dying from their cancer or from other causes. All patient personal and private information is removed before summary cancer statistics are prepared and made available to the public and health professionals through our annual cancer report and other reports on our website.

How are the numbers reported?

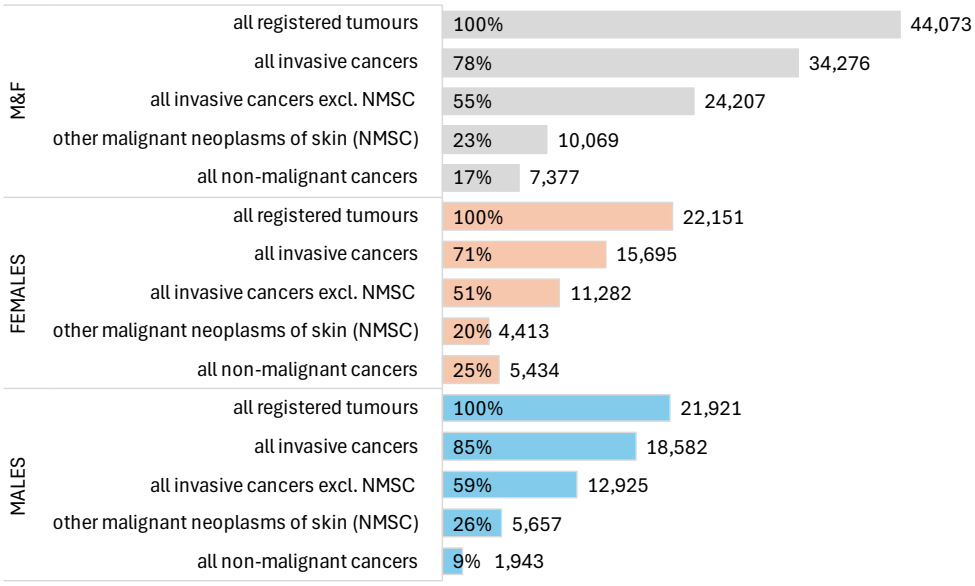
Collecting and checking all this information is performed by a combination of manual and electronic processes. Our staff collect cancer diagnosis information and then use an agreed system of coding (The International Classification of Diseases) to group the cancers into different types.

After a process of collating diverse information from Irish hospitals and validation for accuracy, the annual cancer report is published following analysis of de-identified data.

How many people were diagnosed with cancer?

- On average, 44,073 cancers or related tumours were diagnosed each year during 2020-2022.
- The figure most often quoted in international comparisons ('all invasive cancer, excluding NMSC') averaged 24,207 cases (12,925 males and 11,282 females) diagnosed annually during 2020-2022, or 55% of all registered tumours (just over 1 in 2 of all registered cancers). These are life-changing invasive cancers which often require extensive treatment.
- 23% of all registered cancers (almost 1 in 4) were non-melanoma skin cancers.
- Approximately 17% (almost 1 in 5) of these were non-invasive neoplasms (*in situ* carcinomas, tumours of uncertain behaviour and benign brain and CNS tumours).

Cancer cases: annual average 2020-2022



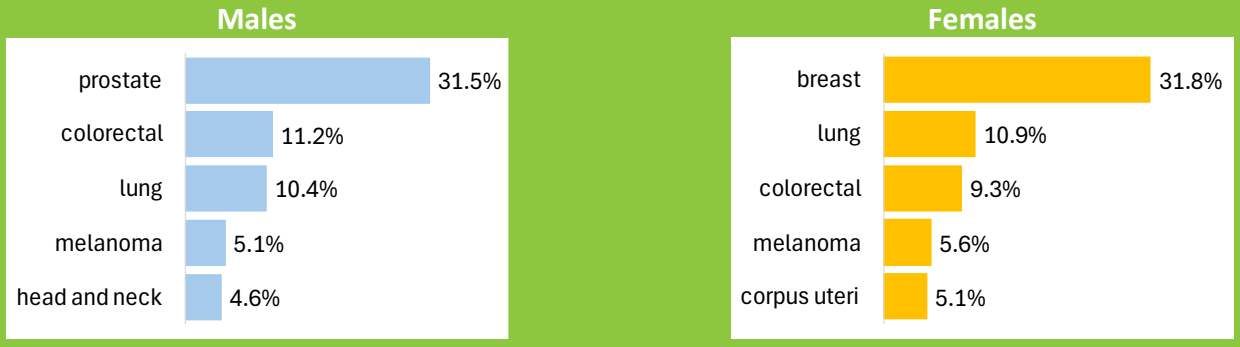
Percentages represent the proportion of *all registered cancers*.

For example, non-melanoma skin cancer made up 20% (1 in 5) of all registered tumours in females and 26% (just over 1 in 4) in males

What are the most common cancers?

- Excluding non-melanoma skin cancer (NMSC), prostate and female breast cancer were the most commonly diagnosed invasive cancers overall, and each comprised almost one-third of all invasive cancers in men and women respectively during the period 2020-2022.
- Colorectal (bowel) cancer, lung cancer, melanoma of skin and head & neck cancer and were the 2nd, 3rd, 4th and 5th most common cancers in males, respectively.
- Lung cancer, colorectal cancer, melanoma of skin, and uterine cancer (corpus uteri) were the 2nd, 3rd, 4th and 5th most common cancers in females, respectively.

Top five most common incident cancers during 2020-2022



% of all invasive cancers, excluding NMSC

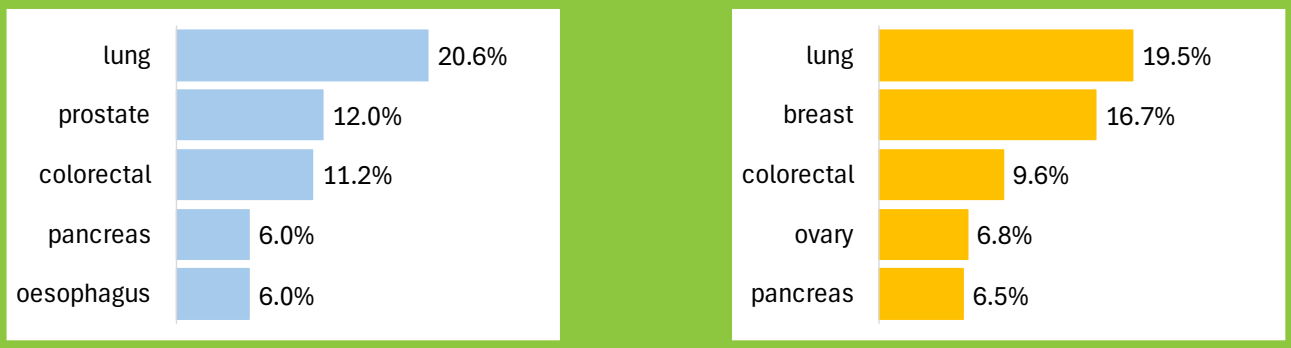
How many people died of cancer?

- On average during 2020-2022 there were 9,797 deaths per year from invasive cancer (5,246 in males and 4,551 in females) during the period 2020-2022, or 10,041 deaths per year across all tumour types.

What are the most common cancers causing death?

- Lung cancer was the leading cause of cancer death in both sexes accounting for 1 in 5 of all cancer deaths during 2020-2022.
- In males, the most common causes of cancer deaths after lung cancer were: (2) cancer of the prostate, (3) colorectal (bowel), (4) pancreas and (5) oesophagus.
- In females, the most common causes of cancer deaths after lung cancer were: (2) cancer of the breast, (3) colorectal (bowel), (4) ovary and (5) pancreas.

Top five most common causes of cancer death during 2020-2022

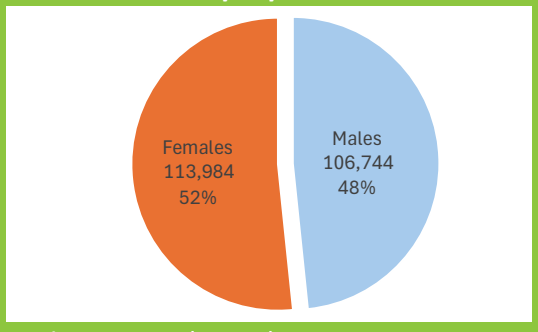


% of all invasive cancer related deaths

How many previously diagnosed cancer patients are still alive?

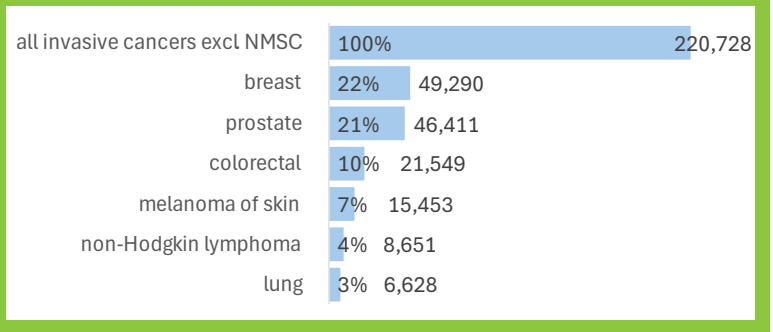
- About 220,728 cancer patients or former cancer patients were alive in Ireland at the end of 2022 (about 4.3% or 1 in 23 of the Irish population).
- The six most common cancers among survivors were: breast cancer (22% of all cancer survivors), prostate cancer (21%), colorectal (bowel) cancer (10%) and skin melanoma (7%), non-Hodgkin lymphoma (4%) and lung cancer (3%) which together account for 68% of all cancer survivors.
- These figures exclude survivors of non-melanoma skin cancers, which are rarely fatal.

Number of cancer survivors on 31/12/2022



Total=220,728 (100%)

Top six most common cancers among cancer survivors



Has the COVID-19 pandemic affected cancer registration?

- The COVID-19 pandemic affected cancer registration in 2020 and to a lesser extent in 2021. Case registration of 2022 was within the projected range based on pre-pandemic trends.
- We employ cancer data registrars embedded in the hospital system. Using active case-finding and electronic records, it normally takes up to two years before complete details of a case are fully registered.
- Cancer registration of incident cases for 2022 is now essentially complete. Some *late registrations* may still emerge as it takes up to five years after the end of a given calendar year before each element of cancer data is received, checked and validated.
- Using projections, we estimated the numbers of cases that would have been expected for 2020, 2021 & 2022 assuming that cancer trends for the years leading up to 2019 still applied, i.e., as if the COVID-19 pandemic had not occurred in early 2020.

Effect of COVID-19 pandemic on cancer diagnoses

- For 2020, the first year of the COVID-19 pandemic, a preliminary analysis estimated that the shortfall of cancer diagnoses due to COVID-19 in 2020 was no greater than 14% [4]. After one further year of registration activity, the shortfall on projected cases for 2020 was estimated at 10% (10% for males; 10% for females) as reported in the 2022 NCRI annual statistical report [1].

- For 2021, a preliminary analysis published in March 2023 showed that the estimated shortfall was 6% (9% in males; 3% in females) [5]. After a further 6 months of registration activity, with registration complete, a re-calculation showed that the shortfall on projected cases in 2021 was 4% (7% for males; 1% for females) where registered cases in females fell within the expected range based on pre-2020 trends [2].

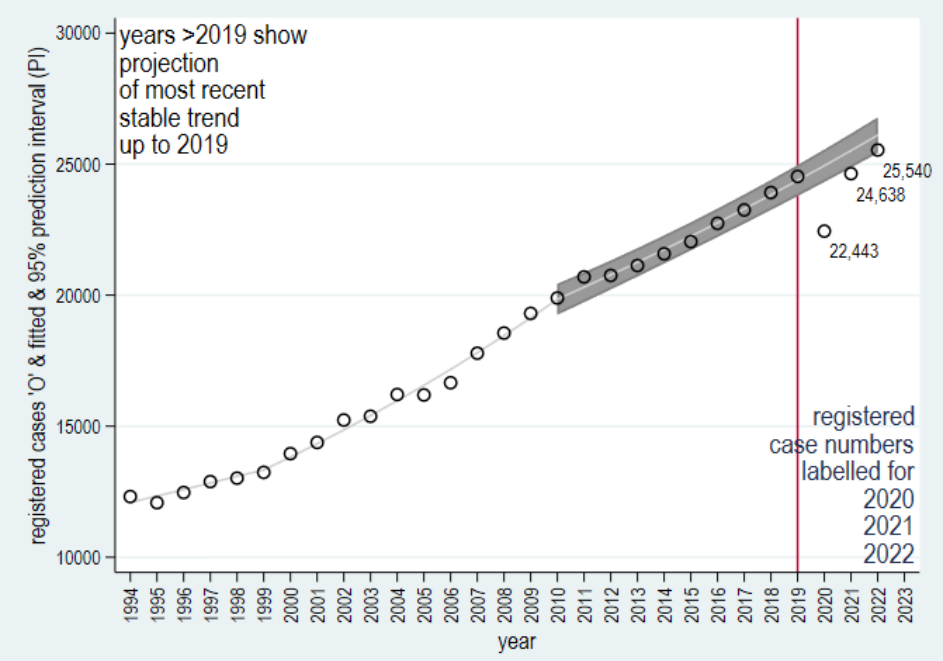
- For 2022, with registration now essentially complete at the time of writing, the estimated shortfall on projected cases was 2% (2% for males; 3% for females) – well within the projected range for both sexes combined and males, and just below the projected range for females.

- The reductions in cancer diagnoses during 2020 & 2021 are likely a result of pandemic-related impacts on health-seeking behaviour among the public, disruptions to cancer control services and COVID-19 related deaths among people who would otherwise have gone on to be diagnosed with cancer [3].

The graph on the right shows the trend in registered cancer cases (excl. NMSC) during 1994-2022.

- The shortfall on projected cases in 2020 was estimated at 10% [1].
- The shortfall on projected cases in 2021 was estimated at 4% [2].
- The shortfall on projected cases in 2022 was 2% – well within the projected range.

Registered case counts in both sexes, all invasive cancers excluding NMSC



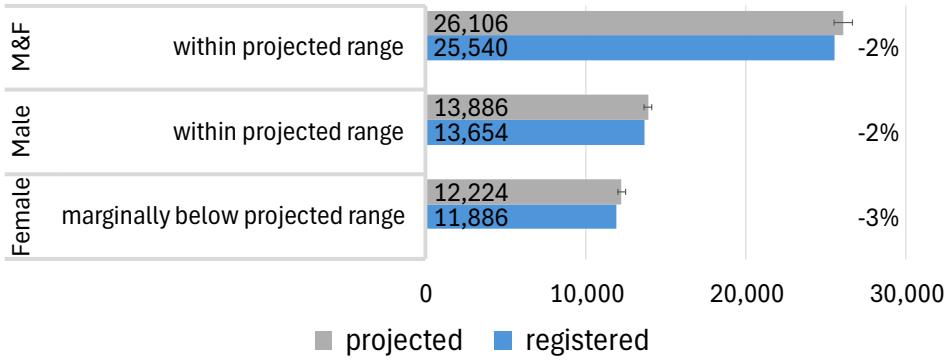
Hollow points: registered case counts

Grey line: fitted over the span of years where the trend was linear, and where the most recent linear trend up to 2019 was projected between 2020-2022

Prediction interval: boundaries for future case counts with 95% probability given observed case count over the last linear trend up to 2019

- The graph on the right shows the registered and projected cases in 2022.
- Overall, 98% of the cases that were projected for 2022 have been registered to date (Oct 2024).
- *i.e. marginal 2% shortfall overall; marginal 2% shortfall for males and 3% shortfall for females.*

Incident cases in 2022: all cancer, excl. NMSC



Does cancer incidence vary across the country?

Yes, most cancers (60%) occur in the eastern half of the country due its higher population density.

- The NCRI reports every year on case counts at the national level as they are essential for cancer policy makers and service provision involved in planning and evaluating health services.
- When comparing cancer incidence patterns between geographical regions, case counts alone can be misleading due to variation in population size and age distribution where less populous regions have fewer cases. Age-standardised cancer rates allow *like-for-like* comparisons across health regions by adjusting for population size and age structure. Regional rates generally mirror the national rates with some variation among regions depending on the diagnosis years selected.
- The health service is transitioning towards six health regions which will cover the following geographical regions: Dublin and Northeast (DNNE), Dublin and Midlands (DNML), Dublin and South East (DNSE), Mid West (MW), South West (SW) and West and North West (WNW) [1]. The six health regions will be fully established by March 2025[2].

Ireland population, number of cancer cases and age-standardised rate, by geographical region of residence

Health Region	population in Ireland 2022*	% of total population in 2022*	annual average number of cancer cases (excl. NMSC) (2020-2022)‡	% of all cancer cases (excl. NMSC) (2020-2022)	age-standardised rate, per 100,000 (2020-2022)
Dublin & North East (DNNE)	1,187,082	23.1%	4,910	20.3%	560
Dublin & Midlands (DNML)	1,077,639	20.9%	4,730	19.5%	596
Dublin & South East (DNSE)	971,093	18.9%	4,772	19.7%	567
South West (SW)	740,614	14.4%	3,778	15.6%	595
Mid West (MW)	413,059	8.0%	2,079	8.6%	583
West and North West (WNW)	759,652	14.8%	3,939	16.3%	576
IRELAND	**5,149,139**	**100%**	**24,207**	**100.0%**	**579**

* Source of population data: https://www.hse.ie/eng/about/who/healthwellbeing/knowledge-management/health-intelligence-files/national-comparative-report-regional-population-profiles.pdf
‡ Annual average number subject to rounding

[1] Organisational Reforms (2023), https://assests.gov.ie
[2] https://healthservice.hse.ie/staff/latest-health-regions-updates/#transition-to-the-interim-health-regions-structures

Which regions had the highest number of cancer cases?

For all invasive cancer cases (excl. NMSC) diagnosed (and resident) within the six geographical regions during 2020-2022:

- The percentage of cancer cases in each region closely mirrored the percentage of the Irish population of each region, i.e. more populous regions had proportionately more cancer cases.
- DNNE had the highest number of cancer cases during 2020-2022 (4,910, cases, 20.3% of all cases), followed by DNML (4,730 , 19.5%) and DNSE (4,772, 19.7%). The MW region had the lowest number of cases (2,079, 8.6%).
- Adjusting for age and population size within regions, DNML (596/100,000) had a higher cancer incidence rate than the national average (579/100,000), and DNNE had a lower rate (560/100,000).

Do cancer incidence rates vary across regions for specific cancers?

For the four most common cancers across the six geographical regions during 2020-2022:

- There was very little variation around the national age-standardised rates for **colorectal** (62/100,000) and **breast cancer** (157/100,000).
- For **lung cancer**, the incidence rate in DNML (74/100,000) was higher than the national average (64/100,000) and lower than the national average in DNSE (56/100,000).
- For **prostate cancer**, the incidence rate in DNSE (225/100,000) was higher than the national average (202/100,000), and lower than the national average in DNNE (185/100,000).

Do cancer survival rates vary across regions for specific cancers?

Age-standardised net-survival allows comparison of cancer survival across different regions and is based on observed survival of cancer patients scaled against survival in the general cancer-free population of the same age, sex and calendar period.

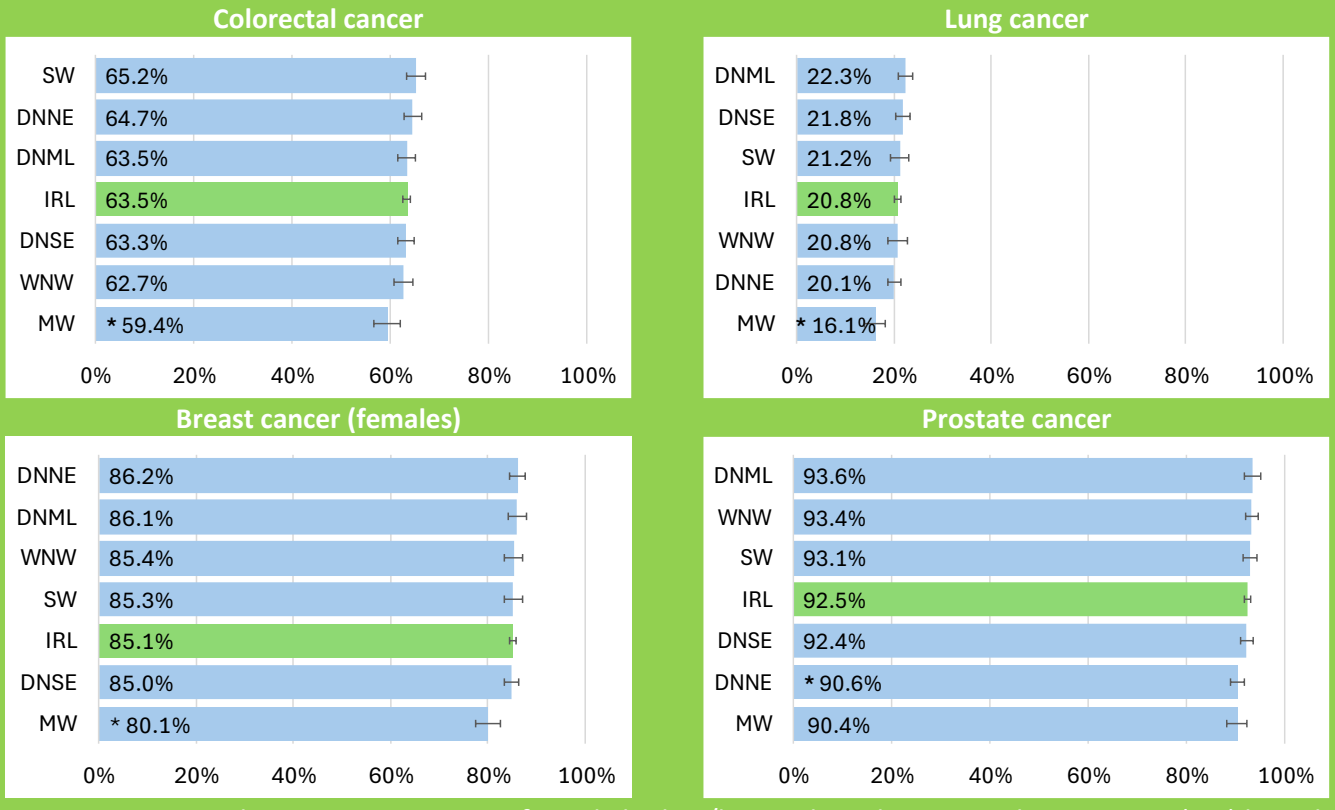
- For **colorectal cancer** in Ireland overall, 5-year net survival was 63.5% for cases diagnosed during 2009-2018. Five of the six health regions had a similar survival rate, except for the MW region (59.4%) which was 4.1 (95%CI -6.7, -1.3) percentage points lower than the national survival proportion.

- For **lung cancer** in Ireland overall, 5-year net survival was 20.8% for cases diagnosed during 2009-2018. Five of the six health regions showed a similar survival rate, except for the MW region (16.1%) which was 4.7 (-7.1, -2.4) percentage points lower than the national survival proportion.

- For female **breast cancer** in Ireland overall, 5-year net survival was 85.1% for cases diagnosed during 2009-2018. Five of the six health regions showed a similar survival rate, except for the MW region (80.1%) which was 5.0 (-7.5, -2.3) percentage points lower than the national survival proportion.

- For **prostate cancer** in Ireland overall, 5-year net survival was 92.5% for cases diagnosed during 2009-2018. Four of the six health regions showed similar survival, except for the DNNE region (90.6%) which was 1.9 (-3.4, -0.3) percentage points lower than the national survival proportion. The survival proportion for the MW region (90.4%) was 2.1 (-4.1, 0.3) lower than the national average, but the difference was less conclusive due to wider confidence interval.

Age standardised 5-year net survival (%) by region: diagnosis period 2009-2018



* 5-year net survival proportion was significantly higher/lower than the national proportion (IRL) based on difference in proportions and associated 95% confidence interval for the difference.

Why do cancer survival rates vary across some regions for the four main cancers?

Comparison of 5-year net survival estimates across geographical regions should be interpreted with certain caveats.

- Late stage at diagnosis and concurrent illness will predispose to poorer survival. These estimates do not adjust for stage, comorbidities, cancer case-mix and socioeconomic indicators which vary across regions.

- The HSE health regions for the six geographical areas were not in existence during the diagnosis period (2009-2018) examined for cancer survival, so the findings relate to the geographical regions where cases resided at diagnosis rather than the current health service administrations in place for those regions.

- The diagnosis period examined (2009-2018) coincided with the programme of centralisation of publicly funded cancer services, in particular surgical services to eight adult high-volume specialist centres where timing of implementation may have varied across the six regions.

- Each of the six geographical regions forms a part of the national total where survival estimates in the larger regions with more cases and bigger populations will be more weighted towards national average survival, whereas estimates for smaller regions with less cases have more uncertainty (or wider confidence intervals) around survival rates.

Variation in cancer incidence and survival across the six HSE health regions will be monitored more comprehensively in future reports as the six new HSE health regions become fully established in 2025.

CANCER INCIDENCE 2020-2022

- On average, 44,073 cancers or other (non-invasive) tumours were diagnosed annually during the period 2020-2022 (Table 2-1).

- Approximately 17% of these were non-invasive tumours (7,377*, in situ* carcinomas, tumours of uncertain behaviour and benign brain and CNS tumours) and 23% were invasive non-melanoma skin cancers (NMSC, 10,069 cases per year) (Table 2-1).

- Invasive cancers (incl. NMSC) averaged 34,276 cases per year during 2020-2022, or an age-standardised rate of 958 male and 712 female cases per 100,000 per year.

- For all invasive cancers excluding NMSC, 24,207 cases (12,925 males and 11,282 females) were diagnosed annually during 2020-2022, or 55% of all registered cancers.

- This is equivalent to an incidence rate of 660 cases per 100,000 males and 509 cases per 100,000 females per year, based on age standardisation with the 2013 European population standard.

- The cancer incidence rate (excl. NMSC) was 19% higher in males relative to females during 2020-2022.

- The cumulative risk (to age 75 years) of being diagnosed with an invasive cancer other than NMSC during 2020-2022 was approximately 1 in 4 for men and 1 in 4 for women.

- The cumulative lifetime risk of being diagnosed with an invasive cancer other than NMSC during 2020-2022 was approximately 1 in 2 for men, and 1 in 2 for women.

- The annual average number of invasive cancers excluding NMSC during 2020-2022 (24,207) was double the average for 1994-1996[3] (12,288 – 6,346 males and 5,942 females).

- These rate and risk statistics are based on the NCRI registered case counts and Irish population estimates available from the CSO at the time of writing.

[3] https://www.ncri.ie/data/incidence-statistics (accessed 20/11/2024)

TABLE 2-1 ANNUAL AVERAGE INCIDENCE, RATE AND CUMULATIVE RISK OF THE MOST COMMON CANCERS: 2020-2022

	case count			rate ‡ * per 100,00		risk # 1 in… to age 75		risk # 1 in… lifetime	
	male	female	all ●	male	female	male	female	male	female
C00-97 all invasive cancers	18,582	15,695	34,276	957.9	712.4				
C00-43, C45-96 all invasive cancers excl. NMSC	12,925	11,282	24,207	660.0	508.9	4	4	2	2
C00-97, D00-48 all registered tumours	21,921	22,151	44,073	1,140.7	984.3				
D00-48 all non-malignant cancers	1,943	5,434	7,377	100.3	223.1				
C01-14 mouth and pharynx	396	158	553	21.0	8.1	95	252	66	157
C00-14, C30-32 head & neck	592	201	793	29.1	9.0	68	203	45	125
C15 oesophagus	366	157	523	19.1	7.5	116	337	63	129
C16 stomach	361	215	576	19.4	10.1	137	247	61	98
C18-20 colorectal	1,452	1,047	2,500	76.3	48.9	32	46	16	21
C22 liver and intrahepatic bile ducts	206	101	307	10.8	4.7	214	448	110	214
C25 pancreas	316	281	597	17.0	13.4	148	182	69	73
C34 bronchus and lung	1,350	1,226	2,576	71.6	58.3	33	35	17	18
C43 melanoma of skin	657	632	1,289	34.0	27.8	70	65	35	40
C44 other malignant neoplasms of skin NMSC	5,657	4,413	10,069	297.9	203.5	8	11	4	5
C50 breast	30	3,587	3,616	1.6	157.1	1,418	11	774	7
C53 cervix uteri	-	250	250	-	10.1		143		127
C54 corpus uteri	-	571	571	-	26.0		64		44
C56 ovary	-	371	371	-	16.7		106		66
C51-52,55,57,58 vulva, vagina, other uterus, placenta and other unspecified gynaecological cancers		216	216		10.0		210		104
C61 prostate	4,067	-	4,067	202.4	-	9		6	
C62 testis	170	-	170	6.6	-	206		202	
C64 kidney, except renal pelvis	409	224	633	20.0	10.2	97	183	63	107
C67 bladder (invasive)	366	134	500	20.7	6.4	151	430	55	147
C67 bladder (T0,T1,Tis), D090, D414 NMIBC ◊	477	144	621	25.7	9.6	100	290	45	157
C71-72 brain & spinal cord	231	179	410	10.9	7.8	170	222	115	145
C73 thyroid	78	204	282	3.5	8.2	465	177	373	156
C81 Hodgkin lymphoma	86	70	156	3.6	2.8	419	506	349	417
C82-86 non-Hodgkin lymphoma	463	342	805	23.5	15.7	93	128	51	67
C90 multiple myeloma	219	148	367	11.5	6.9	199	296	104	151
C91-95 leukaemia	325	211	536	16.3	9.4	135	201	73	110

‡ Average age-standardised rates for 2020-2022, the most recent years for which case registration is complete. ● male + female case counts ('all') are subject to rounding of annual averages.

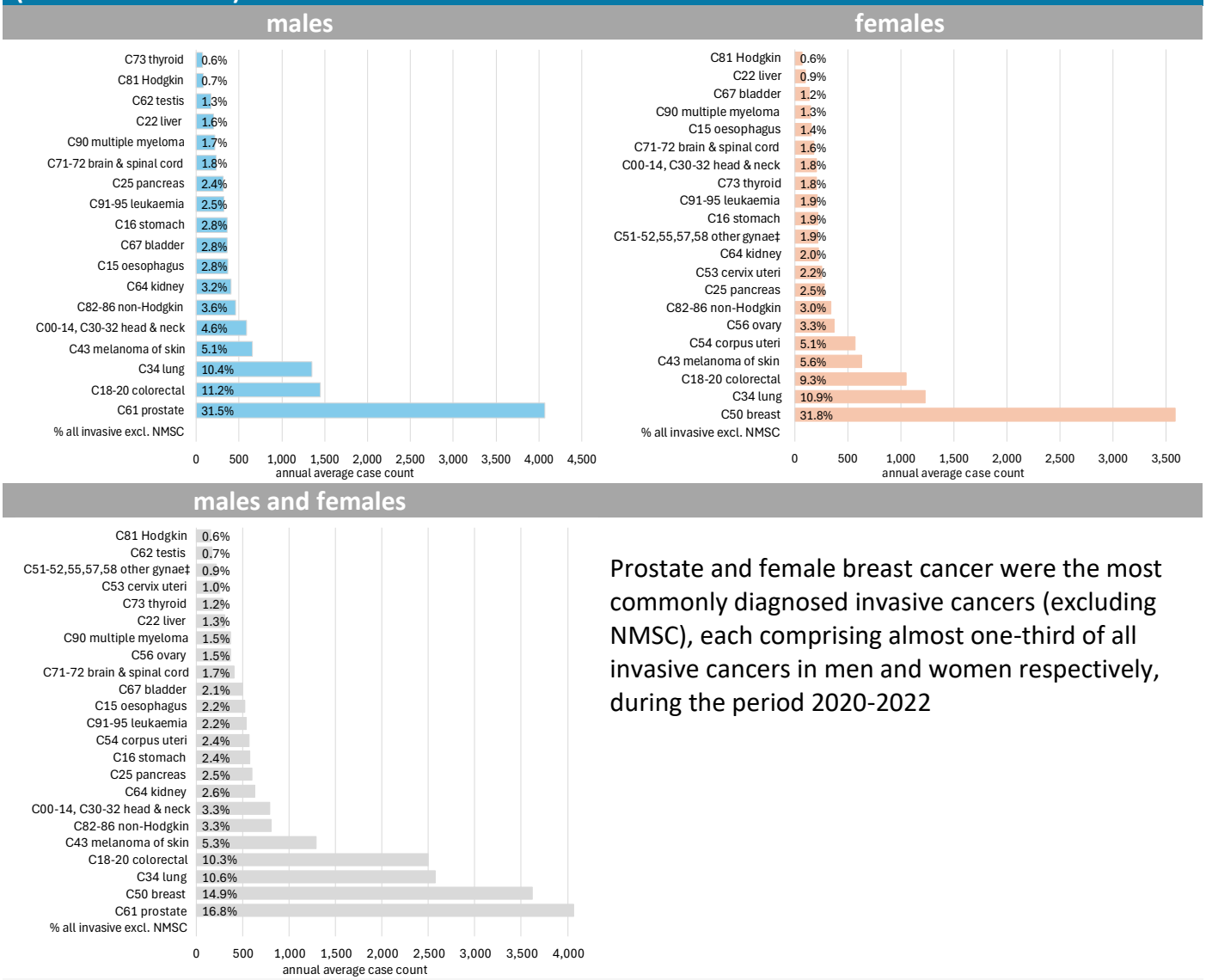
* Rates are weighted according to the 2013 European standard population (ESP); see Appendix II for rates standardised to the 1976 ESP.

Cumulative risk of developing a type of cancer before age 75 and full lifetime risk (both adjusted for population mortality), expressed as a proportion, e.g. lifetime risk of developing an invasive cancer (excluding NMSC) was approximately 1 in 2 in men (probability=46%) and approximately 1 in 2 in women (probability=41%), applying current probability method [7] [8].

◊ NMIBC, non-muscle invasive bladder cancer

A more detailed breakdown of incidence statistics by cancer site is given in Appendix I & II.

FIGURE 2-1
ESTIMATED PERCENTAGES AND RANK OF THE MOST COMMONLY DIAGNOSED INVASIVE CANCER (EXCLUDING NMSC): ANNUAL AVERAGE 2020-2022



Prostate and female breast cancer were the most commonly diagnosed invasive cancers (excluding NMSC), each comprising almost one-third of all invasive cancers in men and women respectively, during the period 2020-2022

Low-incidence invasive cancers are not shown (c.10%), therefore percentages do not sum to 100%.
‡ Other gynae: C51-52,55,57,58 vulva, vagina, other uterus, placenta and other unspecified gynaecological cancers

- The most common cancers in males are: (1) prostate, (2) colorectal cancer, (3) lung cancer, (4) melanoma of skin and (5) head & neck cancer.

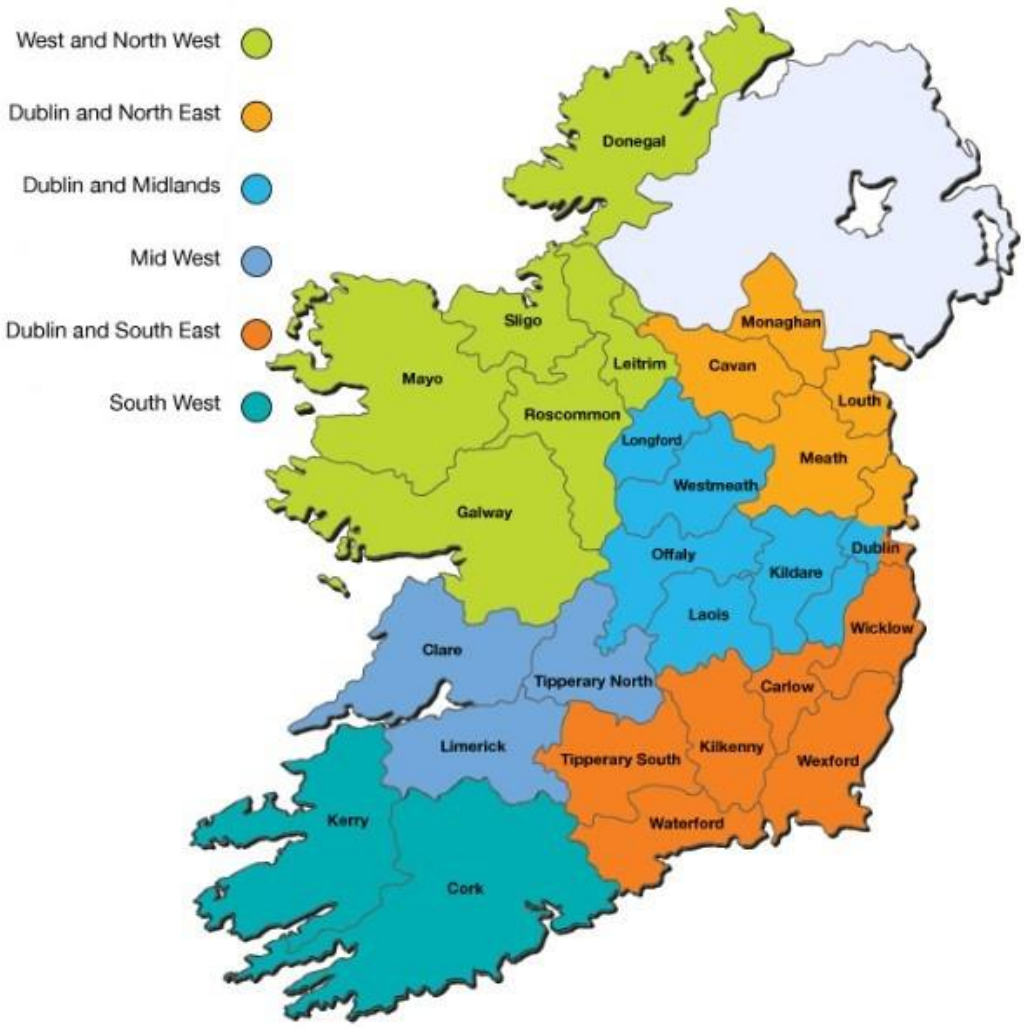
- The most common cancers in females are: (1) breast, (2) lung cancer, (3) colorectal cancer, (4) melanoma of skin, and (5) uterine cancer (corpus uteri), (Figure 2-1).

REGIONAL VARIATION IN CANCER INCIDENCE AND SURVIVAL

Geographical regions

The HSE is transitioning towards six health regions which will cover the following geographical regions: Dublin and Northeast (DNNE), Dublin and Midlands (DNML), Dublin and South East (DNSE), Mid West (MW), South West (SW) and West and North West (WNW) [4]. Each health region will be responsible for providing both hospital and community care for the people in their region will have its own budget, leadership team and responsibility for local decision-making. The six health regions will be fully established by March 2025 [5].

Figure 2-1.
Health regions in Ireland



Map adapted from: https://www.lenus.ie/handle/10147/631494
West North West (WNW); Dublin and North East (DNNE); Dublin and Midlands (DNML); Mid West (MW); Dublin and South East (DNSE); South West (SW)

[4] Organisational Reforms (2023), https://assests.gov.ie
[5] https://healthservice.hse.ie/staff/latest-health-regions-updates/#transition-to-the-interim-health-regions-structures

Incidence of cancer by geographical region

Cancer case counts are projected to increase year on year in Ireland due to demographic ageing and increase in population [8]. The NCRI reports every year on case counts at the national level as they are essential for cancer policy makers and service provision involved in planning and evaluating health services. When comparing cancer incidence patterns between health regions, case counts alone can be misleading due to variation in population size and age distribution, where less populous regions have fewer cases. Age-standardised cancer rates allow like-for-like comparisons across health regions by adjusting for population size and age structure. Regional rates generally mirror the national rates with some variation among regions depending on the diagnosis years selected.

The distribution of cancer cases diagnosed across the country is linked to population density which is skewed towards the eastern half of the country. This is evident in the greater number of cancer cases diagnosed in the three eastern regions (Figure 2-2).

- Looking at all invasive cancer cases diagnosed (and resident) within the six geographical regions during 2020-2022 almost 60% of cancer cases occurred in those residing in the three eastern regions. While DNNE had the highest annual average number of cases (4,910), after adjustment for population size and age structure, the cancer diagnosis rate in DNNE (560/100,000) was lower than the national average (579/100,000) (Figure 2-2).

- Of lung cancer cases, 61% occurred within the three eastern regions during 2020-2022. DNNE, DNML and DNSE had the highest annual average number of cases during 2020-2022 (566, 546 and 456 respectively) and incidence rates in those regions were higher than the national average (64/100,000) for DNML (74/100,000) and lower than the national average for DNSE (56/100,000) (Figure 2-2).

- Of colorectal cancers, 59% occurred within the three eastern regions during 2020-2022. DNSE had the highest annual average number of bowel cancer cases diagnosed during 2020-2022 (520), followed by DNNE (505) and DNML (455), with the MW region having the lowest case numbers (215). Overall there was little variation in bowel cancer rates across the 6 health regions (Figure 2-2).

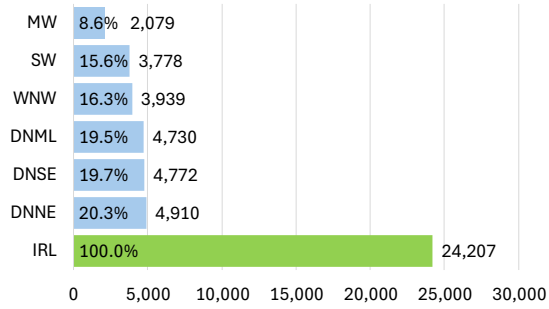
- Of female breast cancers, 62% occurred within the three eastern regions during 2020-2022. DNNE (767 cases), DNSE (726) and DNML (718) had higher numbers of breast cancer cases in keeping with their bigger populations relative to the western regions, although there was little variation in breast cancer rates across the six health regions (Figure 2-2).

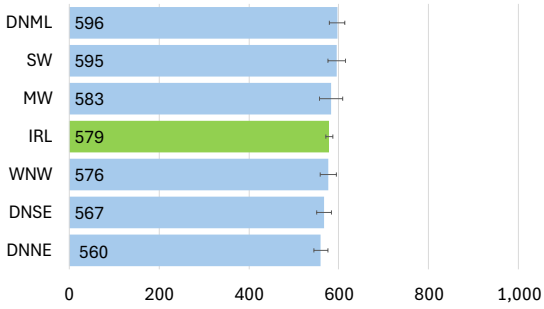
- Of prostate cancers, 59% occurred within the three eastern regions during 2020-2022. DNSE had the highest average annual number of prostate cancer cases (898), with a rate of 225 cases per 100,000 which was above the national average (202/100,000), the other regions had rates very close to the national average apart from DNNE which fell below the national average (185/100,000) (Figure 2-2).

Figure 2-2. Cases diagnosed and age standardised rates by region: 2020-2022

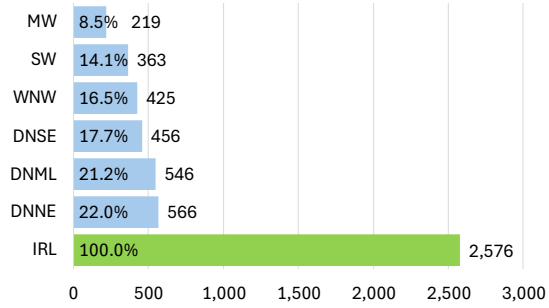
Annual average cases diagnosed: 2020-2022 | **European age-standardised rate per 100,000, ± 95%CI**

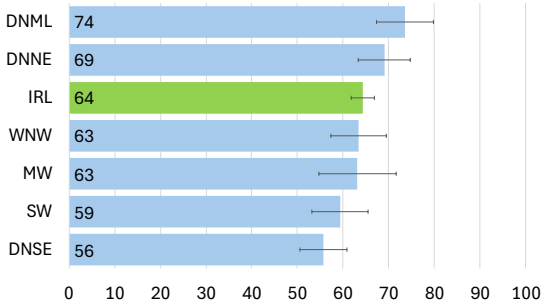
C00-43, C45-96 all invasive cancers excl. NMSC



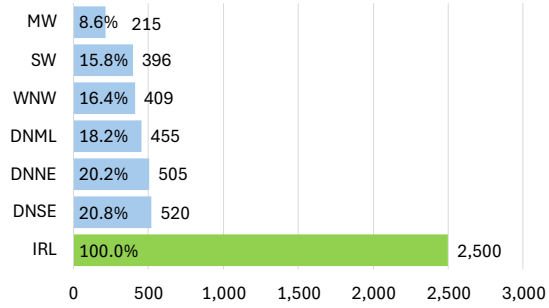


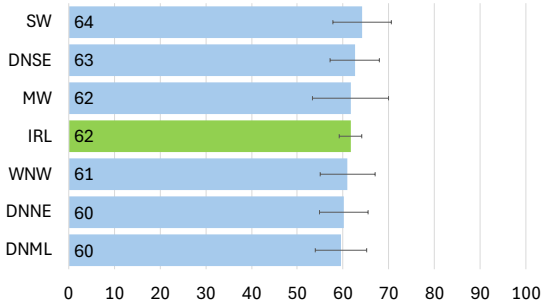
C34 lung cancer



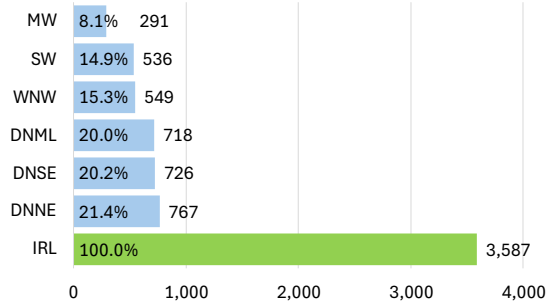


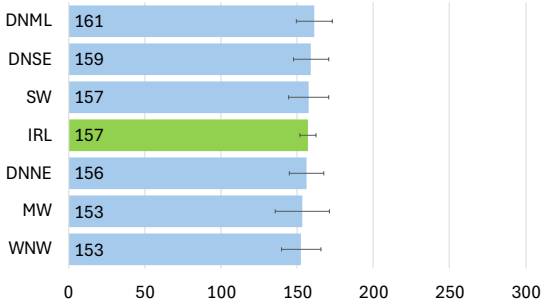
C18-20 colorectal cancer



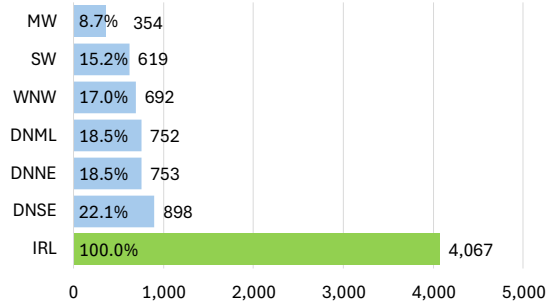


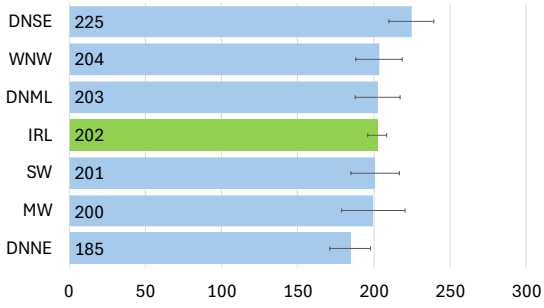
C50 breast cancer (females)





C61 prostate cancer



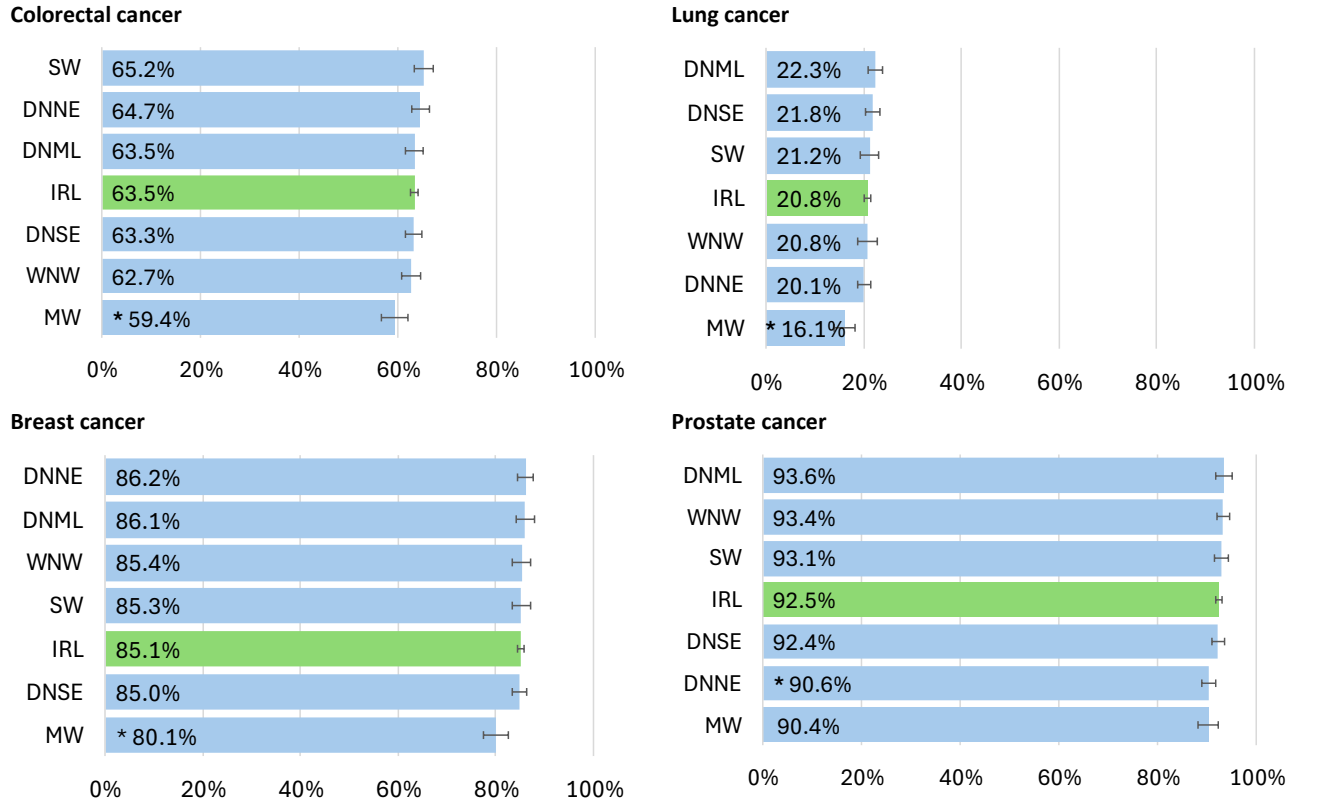


Cancer survival by geographical region

Five-year net survival rate is a commonly quoted metric by population-based cancer registries [9]. Calculation of net survival does not require cause-of-death information which is not always certain in death certificates. *Net survival* is the expected survival in the hypothetical situation in which cancer is the only cause of death, i.e., adjusted for other causes of death using a lifetable for the population [10]. Age-standardised net-survival allows comparison of cancer survival across different regions and diagnosis periods and is based on observed survival of cancer patients scaled against survival in the general population of the same age, sex and calendar period using standard age weights for each cancer type [11].

Five-year age-standardised net survival statistics are presented for the four most common cancers, lung, colorectal, breast and prostate cancer diagnosed during 2009-2018 within six geographical regions where patients resided, and for Ireland ('IRL') overall as the reference level (Figure 2-3).

Figure 2-3.
Age standardised 5-year net survival (%) by region: diagnosis period 2009-2018



* 5-year net survival proportion was significantly higher/lower than the national proportion (IRL) based on difference in proportions and associated 95% confidence interval for the difference.

For any cancer subset and period of interest, calculating net-survival requires adequate follow-up time. Survival is presented here for the diagnosis period 2009-2018 for each geographical region. This time period was chosen to optimise the balance between adequate case numbers for precision, recency and enough follow-up time to allow measurement of survival at five years after diagnosis.

- For colorectal cancer in Ireland overall, 5-year net survival was 63.5% for cases diagnosed during 2009-2018. Five of the six health regions had a similar survival rate, except for the MW region (59.4%) which was 4.1 (95%CI: -6.7, -1.3, p<0.01) percentage points lower than the national survival proportion (Figure 2-3).

- For lung cancer in Ireland overall, 5-year net survival was 20.8% for cases diagnosed during 2009-2018. Five of the six health regions showed a similar survival rate, except for the MW region (16.1%) which was 4.7 (-7.1, -2.4, p<0.001) percentage points lower than the national survival proportion.

- For female breast cancer in Ireland overall, 5-year net survival was 85.1% for cases diagnosed during 2009-2018. Five of the six health regions showed a similar survival rate, except for the MW region (80.1%) which was 5.0 (-7.5, -2.3, p<0.001) percentage points lower than the national survival proportion.

- For prostate cancer in Ireland overall, 5-year net survival was 92.5% for cases diagnosed during 2009-2018. Four of the six health regions showed similar survival, except for the DNNE region (90.6%) which was 1.9 (-3.4, -0.3, p<0.05) percentage points lower than the national survival proportion. The survival proportion for the MW region (90.4%) was 2.1 (-4.1, 0.3, p=0.063) lower than the national average, but the difference is less conclusive due to wider confidence interval.

These survival estimates should be interpreted with certain caveats.

1) The HSE health regions were not in existence during the diagnosis period (2009-2018) examined for cancer survival, so the findings relate to the geographical regions where patients resided at diagnosis rather than the current health service administrations in place for those regions.

2) The diagnosis period examined (2009-2018) coincided with the programme of centralisation of publicly funded cancer services, in particular surgical services to eight adult high-volume specialist centres where timing of implementation may have varied across the six regions.

3) Each of the six individual regions forms a part of the national total where survival estimates in the larger regions with more cases and bigger populations will be more weighted towards national average survival. Survival estimates for smaller regions with less cases have more uncertainty (or wider confidence intervals) around survival rates.

4) Late stage at diagnosis and concurrent illness will predispose to poorer survival. These estimates do not adjust for stage, comorbidities, cancer case-mix and socioeconomic indicators which vary across regions.

Variation in cancer incidence and survival across the six HSE health regions will be monitored more comprehensively in future reports as the six new HSE health regions become fully established in 2025.

CANCER MORTALITY 2020-2022

- In 2022, 29% of deaths that occurred in Ireland were attributable to cancer [12].
- An annual average of 9,797 deaths from invasive cancer occurred during the period 2020-2022 (5,246 in males and 4,551 in females), or 10,041 deaths from any neoplasm (Table 3-1).
- This represents an estimated age-standardised mortality rate of 217 invasive cancer deaths per 100,000 females and 301 deaths per 100,000 males per year (Table 3-1).

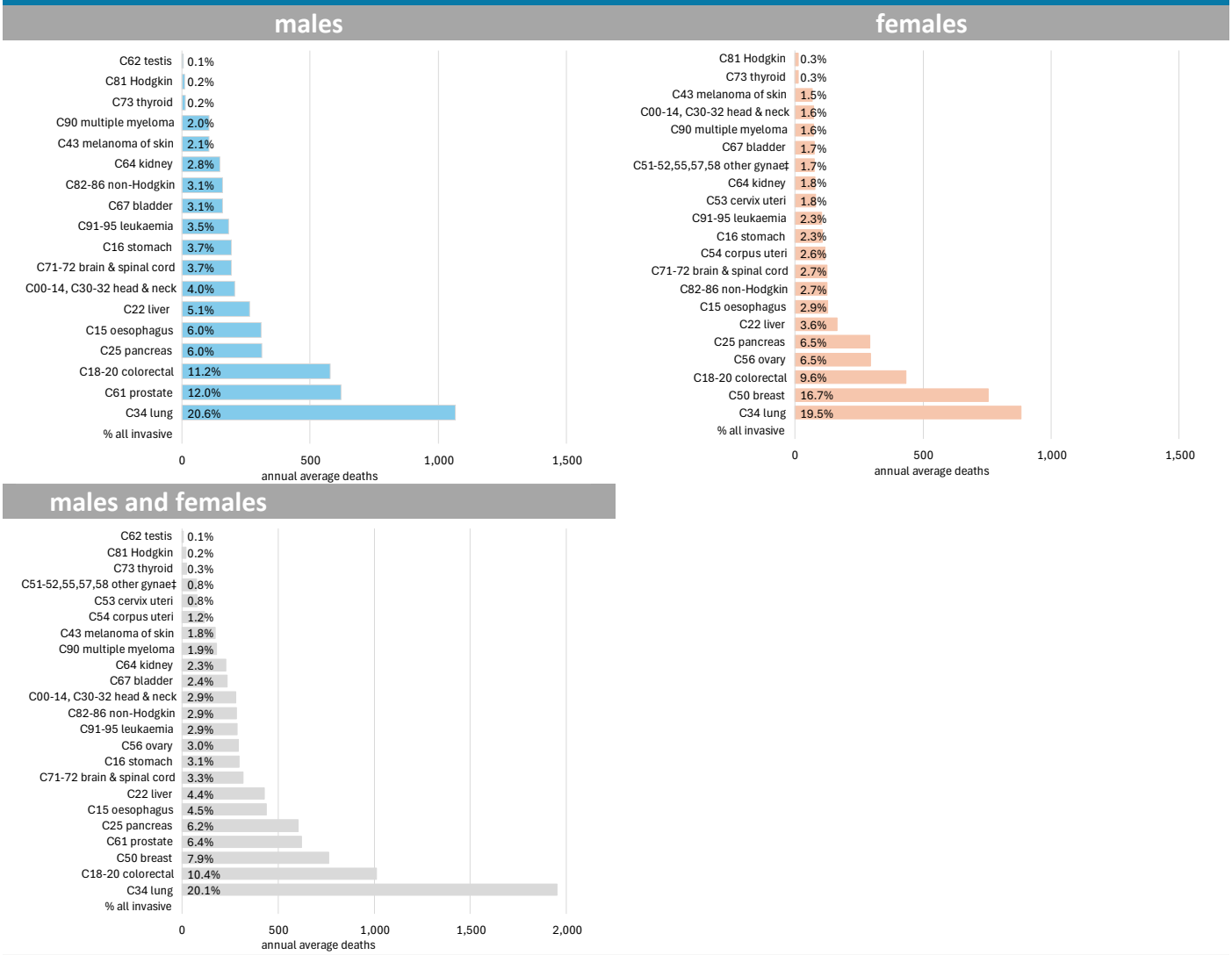
TABLE 3-1
ANNUAL AVERAGE MORTALITY ATTRIBUTABLE TO CANCER: 2020-2022

	deaths			rate*/100,000		risk # 1 in… to age 75	
	males	females	all●	males	females	males	female
C00-97, D00-48 all registered tumours	5,375	4,666	10,041	309.6	222.5	11	12
C00-97 all invasive cancers	5,246	4,551	9,797	301.4	216.9	11	12
C00-43, C45-96 all invasive cancers excl. NMSC	5,175	4,523	9,699	296.9	215.6	11	12
C01-14 mouth and pharynx	142	56	198	7.3	2.7	295	1,120
C00-14, C30-32 head & neck	206	72	278	10.9	3.4	210	809
C15 oesophagus	309	129	438	16.7	6.3	150	505
C16 stomach	192	106	298	11.0	5.1	314	549
C18-20 colorectal	578	434	1,012	33.3	20.8	99	150
C22 liver and intrahepatic bile ducts	264	165	429	14.5	7.9	191	344
C25 pancreas	310	293	603	17.2	14.2	165	204
C34 bronchus and lung	1,066	884	1,950	58.7	42.6	46	56
C43 melanoma of skin	106	67	174	6.2	3.1	532	867
C50 breast	8	753	762	0.5	35.1	6,693	71
C53 cervix uteri	-	80	80	-	3.5		476
C54 corpus uteri	-	118	118	-	5.6		486
C56 ovary	-	294	294	-	13.9		160
C51-52,55,57,58 vulva, vagina, other uterus, placenta and other unspecified gynaecological cancers	-	77	77	-	3.7		743
C61 prostate	620	-	620	40.7	-	169	
C62 testis	5	-	5	0.2	-	8,197	
C64 kidney, except renal pelvis	147	79	227	8.3	3.8	382	844
C67 bladder	159	77	236	10.2	3.7	612	1,427
C71-72 brain & spinal cord	192	124	316	9.4	5.6	215	326
C73 thyroid	13	12	25	0.7	0.6	4,026	4,889
C81 Hodgkin lymphoma	10	12	21	0.6	0.6	5,981	5,948
C82-86 non-Hodgkin lymphoma	159	124	283	9.4	6.1	420	593
C90 multiple myeloma	106	74	180	6.3	3.6	657	1,061
C91-95 leukaemia	183	103	286	10.8	5.0	357	645

Source of data: Central Statistics Office, Ireland (VSA29, 31/10/2024). ●male and female totals are subject to rounding of annual averages.
*Rates are standardised to the 2013 European Standard Population (ESP), see Appendix II for rates standardised to 1976 ESP.
Cumulative risk of dying of cancer before 75th birthday calculated using method as described [13], expressed as a proportion, e.g. 1 in 10 in males; 1 in 12 in females.
See Appendix III for mortality statistics of other cancers.

- The estimated cumulative risk of dying from invasive cancer before 75th birthday was approximately 1 in 12 for women and 1 in 11 for men.
- Lung cancer was the leading cause of cancer death in both sexes, with an average of 1,950 deaths per year or 19.5% of cancer deaths in women and 20.6% of cancer deaths in men during the period 2020-2022 (Table 3-1, Figure 3-1).
- Colorectal cancer was the next most common cause of cancer death overall (but 3rd most common in females and in males), with an average of 1,012 deaths per year or 9.6% of cancer deaths in females and 11.2% of cancer deaths in males.
- Deaths from lung, colorectal, breast and prostate cancers combined made up almost half (45%) of all deaths from cancer during 2020-2022 compared to 46% during the period 2016-2018 [4].

FIGURE 3-1
PERCENTAGES AND RANK OF THE MOST COMMON CANCER DEATHS: ANNUAL AVERAGE 2020-2022



Cancers accounting for smaller percentages of cancer deaths (c.10% in total) are not shown, therefore percentages do not sum to 100%. Mortality data were provided by the Central Statistics Office (CSO), VSA29 dated 31/10/2024. 'all invasive' refers to ICD10 C00-97.
‡ Other gynae: C51-52,55,57,58 vulva, vagina, other uterus, placenta and other unspecified gynaecological cancers

- Deaths from cancers of the pancreas and oesophagus in males ranked 4th and 5th respectively and comprised 11% of all cancer deaths in males. Mortality rankings for these high-fatality cancers were much higher than their incidence rankings (Figure 3-1).

- Deaths from cancers of the ovary and pancreas ranked 4th and 5th respectively in female and comprised 13% of cancer deaths in women, again much higher than the incidences ranking for these high fatality cancers (Fig. 3-1). A more detailed breakdown of mortality statistics is given in Appendix III.

CANCER PREVALENCE

Complete cancer prevalence is defined as the number of persons diagnosed with cancer who were still alive at a particular point in time (i.e. alive on 31/12/2022 for this report).

For a cancer registry, fixed-duration prevalence is the number of cancer survivors calculated directly from observed data collected by the cancer registry since it was established. The NCRI began national collation of cancer registration in 1994, and it currently holds 29 years of complete or near-complete incidence and follow-up information on cancer cases, up to the end of 2022. However, there remains a subset of cancer patients alive at the end of 2022 who are not included in NCRI data because they were diagnosed before 1994. The size of this small hidden subset will gradually diminish as the registry accrues 40+ years of cancer incidence and follow-up data [14] from 2035 onwards. In the meantime, the size of the hidden subset was estimated [15]. The sum of the fixed-duration cancer survivor population (1994-2022) and estimated numbers of survivors from the hidden cancer subset (pre-1994) gives an estimate of complete prevalence (Table 4-1).

TABLE 4-1. FIXED DURATION AND ESTIMATED COMPLETE PREVALENCE BY SEX: ESTIMATED NUMBER OF CANCER SURVIVORS* AT END OF 2022.

sex	Fixed duration prevalence – diagnosed during 1994-2022	%	Complete prevalence – diagnosed up to end of 2022	%
M&F	209,402	100%	220,728	100%
males	103,229	49%	106,744	48%
females	106,173	51%	113,984	52%

*Survivors of any invasive cancer other than non-melanoma skin cancer (ICD-10 C00-96 excluding C44). Only the first invasive cancer was counted per patient ignoring any subsequent cancers in other body sites.

The figure reported for complete cancer prevalence (up to 31/12/2021) in last year's annual report was 214,905 [2]. For this report (up to 31/12/2022) the same figure was estimated at 220,728 (Table 4-1) which comprised c.4.3% of the Irish population in 2022. These figures include patients still undergoing active treatment or palliative treatment at the end of 2022, in addition to longer-term survivors.

TABLE 4-2. FIXED DURATION AND ESTIMATED COMPLETE PREVALENCE, BY CANCER TYPE: NUMBER OF CANCER SURVIVORS AT THE END OF 2022

	Fixed duration prevalence diagnosed during 1994-2022	Complete prevalence diagnosed up to end of 2022	%*
C50 breast	46,579	49,290	22.3%
C61 prostate	46,163	46,411	21.0%
C18-20 colorectal	20,556	21,549	9.8%
C43 melanoma of skin	14,345	15,453	7.0%
C82-86 non-Hodgkin lymphoma	8,079	8,651	3.9%
C34 bronchus and lung	6,544	6,628	3.0%
C54 corpus uteri	6,006	6,362	2.9%
C91-95 leukaemia	5,667	6,241	2.8%
C00-14, C30-32 head & neck	5,555	5,786	2.6%
C64 kidney, except renal pelvis	5,572	5,768	2.6%
C62 testis	3,943	5,333	2.4%
C53 cervix uteri	4,281	5,047	2.3%
C73 thyroid	3,696	3,886	1.8%
C67 bladder	3,047	3,760	1.7%
C56-57 ovary and other and unspecified female genital organs	2,935	3,343	1.5%
C81 Hodgkin lymphoma	2,540	3,228	1.5%
C16 stomach	2,343	2,413	1.1%
C71-72 brain & spinal cord	1,857	2,248	1.0%
C90 multiple myeloma	2,048	2,059	0.9%
C15 oesophagus	1,474	1,498	0.7%
C25 pancreas	898	909	0.4%
C22 liver and intrahepatic bile ducts	680	689	0.3%

*Percentage of all cancer survivors (C00-43, C45-96). Percentages do not add up to 100% of the 'all cancer' set displayed in Table 4-1 (N=220,728) as the patient's first cancer may have been of a rarer type not listed in Table 2-2.

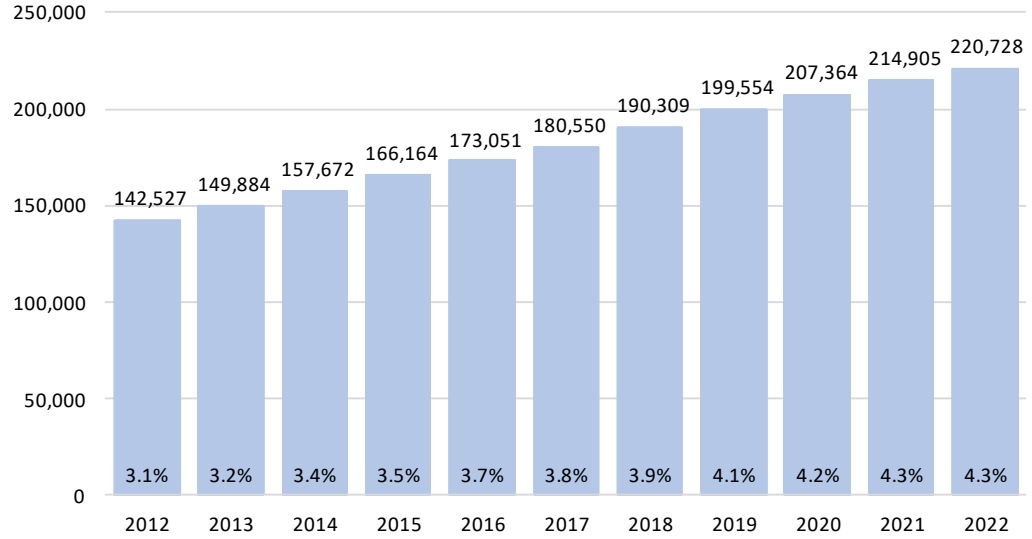
The number of survivors of a given cancer type is related to its incidence rate, median age at diagnosis and survival prospects. Rare cancers with poorer survival diagnosed in older people comprise only a small proportion of cancer survivors. Conversely, common cancers with good survival prospects diagnosed in younger persons will tend to predominate in the prevalent cancer population.

Some patients may have been diagnosed with more than one invasive tumour type, in which case only the first tumour was counted for that patient. Percentages do not add up to 100% of the 'all cancer' set displayed in Table 4-1, as the patient's first cancer may have been of a rarer type not listed in Table 4-2.

Overall, the topmost common cancers in the prevalent cancer population were breast cancer (22% of all cancer survivors), prostate cancer (21%), colorectal cancer (10%) and skin melanoma (7%) (Table 4-2).

Lung cancer, a common cancer with relatively poor survival, accounted for only 3% of survivors, and less common cancers with poor survival such as liver, pancreatic, oesophageal cancers and multiple myeloma comprised <3% of all cancer survivors combined (Table 4-2).

FIGURE 4-1
ESTIMATED COMPLETE CANCER PREVALENCE IN IRELAND UP TO END OF 2022



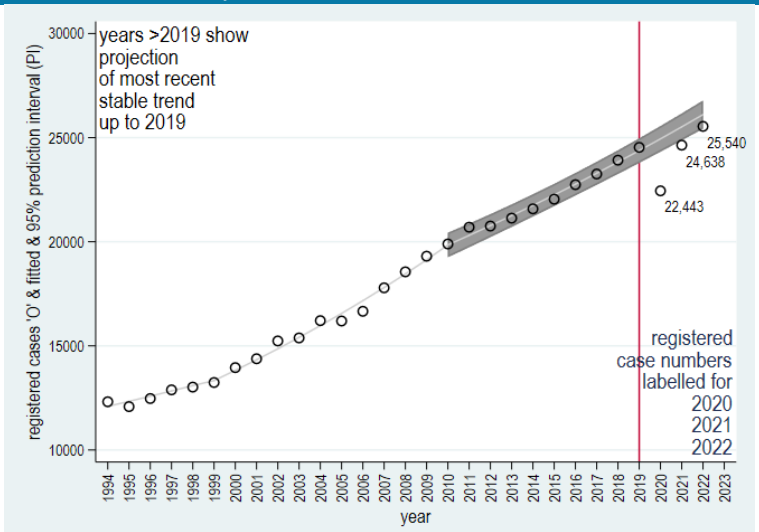
The numbers above the bars show the numbers living with a cancer diagnosis at the end of the year on the x-axis.
Percentages represent the proportion of the Irish population living with a cancer diagnosis.
Figures for 2022 are based on the latest available complete data at the time of writing.

COVID-19 IMPACTS ON CANCER CASE NUMBERS DIAGNOSED IN 2022

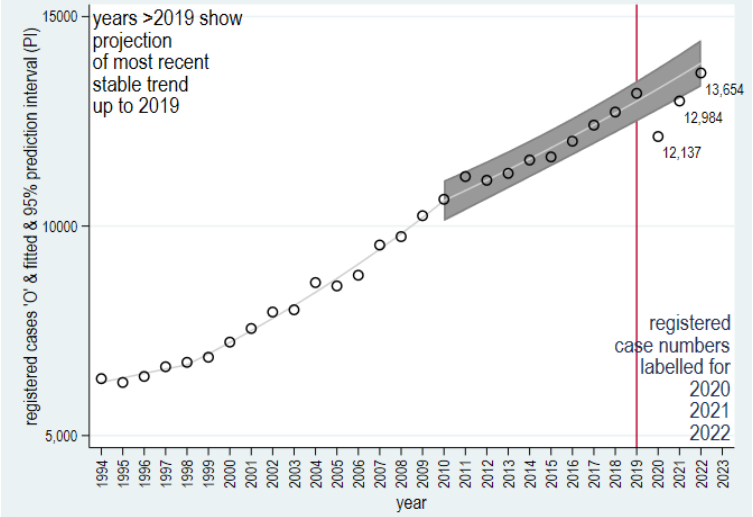
To assess the impact of COVID-19 on numbers of cancers diagnosed in Ireland up to 2022, the most recent stable trend for number of cases per year over the period 1994-2019 was projected to 2022 using Joinpoint regression [12]. The projected numbers therefore represent expected numbers of cancers diagnosed up to 2022 as if the COVID-19 pandemic had not emerged in early 2020. Prediction intervals (95% level) were calculated over the most recent stable trend and projected numbers were compared to observed numbers of cancers.

FIGURE 5-1. CASE COUNTS, ALL CANCERS EXCLUDING NMSC: REGISTERED *VS.* PROJECTED 1994-2022

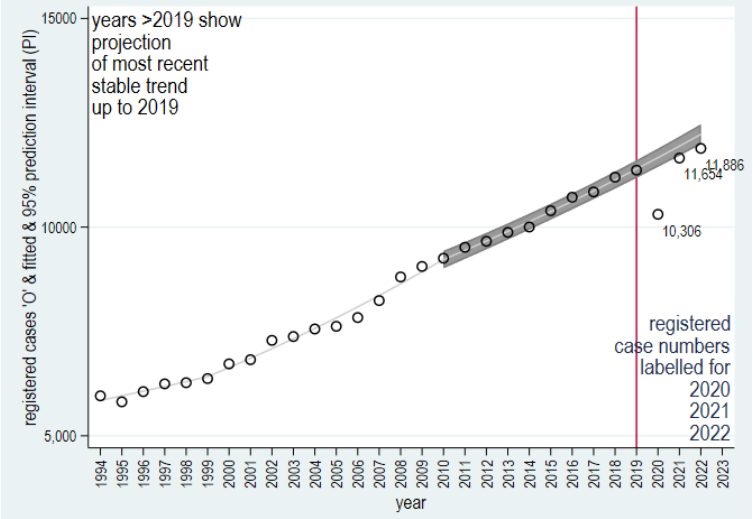
MALES AND FEMALES



MALES



FEMALES



Interpretation of graphics:

- The hollow points show registered cases counts.
- The grey line is the Joinpoint [17] fitted line over the span of years where the trend was linear, and where the most recent linear trend up to 2019 was extrapolated between 2020-2022.
- The greyed out 95% prediction interval is fitted around observed case counts over the last linear trend up to 2019 and projected from 2019 through 2020 to 2022

- The prediction interval sets boundaries where future case counts will fall with 95% probability given what has already been observed over the last linear trend up to 2019.

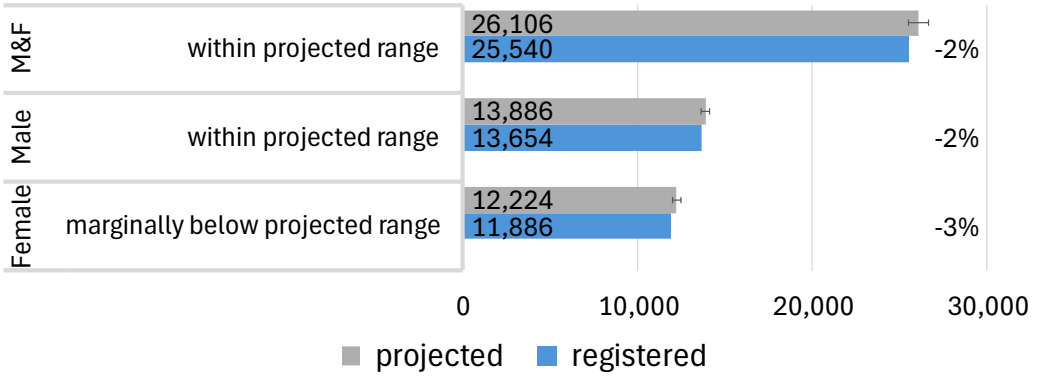
In Figure 5-1, 'all cases' refer to cancer cases registered each year from 1994 to 2022. Registration figures years up to 2022 were complete at the time of writing. It normally takes up to two years before complete details of a case are fully registered for incidence reporting purposes. Although it can take up to five years after the end of a given calendar year before every element of cancer data (e.g. treatment data) are received, checked, and validated.

- For 2020, the first year of the COVID-19 pandemic, a preliminary analysis estimated that the shortfall of cancer diagnoses due to COVID-19 in 2020 was no greater than 14% [4]. After one further year of registration activity, the shortfall on projected cases for 2020 was estimated at 10% (10% for males; 10% for females) as reported in the 2022 NCRI annual statistical report [1].

- For 2021, a preliminary analysis published in March 2023 showed that the estimated shortfall was 6% (9% in males; 3% in females) [5]. After a further 6 months of registration activity, with registration complete, a re-calculation showed that the shortfall on projected cases in 2021 was 4% (7% for males; 1% for females) where registered cases in females fell within the expected range based on pre-2020 trends [2].

- For 2022, with registration now essentially complete at the time of writing, the estimated shortfall on projected cases was 2% (2% for males; 3% for females) – well within the projected range for both sexes combined and males, and just below the projected range for females (Figure 5-2).

FIGURE 5-2. REGISTERED CANCER CASE COUNT *VS.* PROJECTED CASE COUNT FOR 2022: ALL CANCERS EXCLUDING NMSC, BY SEX



Percentage labels show the percentage change from projected to registered cases for 2022, and whether the observed number was higher, lower or within the 95% range of the prediction interval represented by the error bars.

- In 2022, for all cancer cases in both sexes combined registered cases were 2% below the projected case number based on the trend up to 2019 (25,540 *vs.* 26,106), but still within the projected range.
- Registered cases for males were 2% below the projected case number (13,654 *vs.* 13,88 shortfall), but within the projected range.
- Registered cases for females were 3% below the expected range (11,886 *vs.* 12,224) – just marginally below the lower limit of the projected range.

The reductions in cancer diagnoses during 2020 and 2021 are likely a result of pandemic-related impacts on health-seeking behaviour among the public, disruptions to cancer control services and COVID-19 related deaths among people who would otherwise have gone on to be diagnosed with cancer [3].

For the estimated shortfalls of cases 2020, 2021 it was assumed that the cancer case trends, increasing up to 2019, would have continued along the same trajectory as if the COVID-19 pandemic had not occurred. This assumption on pre-COVID cancer trends will be monitored as more years of registration have accrued. After lower than projected cases number in 2020 and 2021, overall case numbers fell within the projected range in 2022 (Figures 5-1, and 5-2).

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APPENDIX I: INCIDENT CANCER CASES

3-year annual average 2020-2022: cases, risk of developing cancer before 75th birthday and lifetime risk

	case count			risk # to age 75 1 in …		lifetime risk # 1 in …	
cancer	males	females	all †	males	females	males	females
C00-96 all invasive cancers	18,582	15,695	34,276				
C00-43, C45-96 all invasive cancers excl. NMSC	12,925	11,282	24,207	4	4	2	2
C00-96, D00-48 all registered tumours	21,921	22,151	44,073				
D00-48 all non-malignant cancers	1,943	5,434	7,377				
C00 lip	20	5	25	2,626	10,149	1,084	3,597
C01 base of tongue	39	10	49	925	3,317	703	2,405
C02 other and unspecified parts of tongue	59	32	91	593	1,220	444	817
C03 gum	10	10	20	3,576	5,110	2,435	2,249
C04 floor of mouth	33	13	46	1,041	2,563	828	1,955
C05 palate	19	9	28	2,203	4,663	1,353	2,743
C06 other and unspecified parts of mouth	23	17	40	1,826	2,987	1,055	1,220
C07 parotid gland	32	13	45	1,628	3,573	650	1,841
C08 other and unspecified major salivary glands	7	6	13	6,304	6,951	3,170	4,263
C09 tonsil	77	20	97	431	1,728	379	1,466
C10 oropharynx	32	8	40	1,026	5,028	840	3,123
C11 nasopharynx	15	3	18	2,755	13,021	1,979	8,811
C12 pyriform sinus	15	4	19	2,961	9,512	1,537	6,942
C13 hypopharynx	23	9	31	1,674	4,854	1,138	2,672
C14 other and ill-defined sites in the lip, oral cavity and pharynx	12	5	17	3,386	7,749	1,934	4,961
C15 oesophagus	366	157	523	116	337	63	129
C01-C06 and C09-C13 oral and pharyngeal cancer	345	134	479	108	302	82	188
C01-14 mouth and pharynx	396	158	553	98	259	69	159
C16 stomach	361	215	576	137	247	61	98
C17 small intestine	71	52	124	545	805	339	450
C18 colon	882	728	1,610	54	71	25	29
C19 rectosigmoid junction	111	71	182	388	638	209	310
C20 rectum	474	261	735	88	156	51	91
C21 anus	31	49	80	1,292	841	862	505
C19-20 rectum and rectosigmoid junction	585	332	916	72	125	41	71
C18-20 colorectal	1,452	1,047	2,500	32	46	16	21
C18-21 colorectal and anus	1,483	1,096	2,579	31	44	16	20
C22 liver and intrahepatic bile ducts	206	101	307	214	448	110	214
C23 gallbladder	14	37	52	3,540	1,535	1,512	531
C24 other and unspecified parts of biliary tract	112	94	207	443	533	189	216
C23-24 gallbladder and biliary tract	127	132	258	394	395	168	154
C25 pancreas	316	281	597	148	182	69	73
C26 other and ill-defined digestive organs	44	30	74	1,099	1,721	496	663
C30 nasal cavity and middle ear	14	6	20	3,048	7,783	1,792	3,983
C31 accessory sinuses	7	3	10	5,278	12,104	3,881	9,957
C32 larynx	155	29	185	258	1,192	157	861
C00-14, C30-32 head & neck	592	201	793	68	203	45	125
C33 trachea	1	1	2				
C34 bronchus and lung	1,350	1,226	2,576	33	35	17	18
C34 non-small cell lung cancer (NSCLC)	1,199	1,049	2,248	37	42	19	21
C34 small cell lung cancer (SCLC)	151	177	327	255	211	161	135
C33-34 bronchus, lung and trachea	1,351	1,227	2,578	33	35	17	18
C37 thymus	8	5	14	4,866	6,921	3,289	4,695
C38 heart, mediastinum and pleura	14	5	19	3,603	9,318	1,410	4,466
C40 bone and articular cartilage of limbs	9	7	16	3,934	5,589	3,166	4,195
C41 bone and articular cartilage of other and unspecified sites	15	9	24	2,411	3,722	1,790	3,148
C43 melanoma of skin	657	632	1,289	70	65	35	40
C41-42 bone and articular cartilage of limbs and other and unspecified sites	15	9	24	2,411	3,722	1,790	3,148
C44 other malignant neoplasms of skin NMSC	5,657	4,413	10,069	8	11	4	5
C45 mesothelioma	35	12	47	2,106	3,282	570	1,836
C46 Kaposi sarcoma	8	1	8	4,496	58,219	4,208	58,219
C47 peripheral nerves and autonomic nervous system	2	1	3				
C48 retroperitoneum and peritoneum	9	18	27	5,460	2,219	2,501	1,315
C49 other connective and soft tissue	131	73	204	385	572	170	351
C50 breast	30	3,587	3,616	1,418	11	774	7
C51 vulva	-	67	67		801		320
C52 vagina	-	18	18		2,357		1,208
C53 cervical adenocarcinoma	-	49	49		742		673
C53 cervical squamous cell carcinoma	-	187	187		191		170
C53 cervix uteri	-	250	250		143		127
C54 corpus uteri	-	571	571		64		44

3-year annual average 2020-2022: cases, risk of developing cancer before 75th birthday and lifetime risk

cancer	case count			risk # to age 75 1 in …		lifetime risk # 1 in …	
	males	females	all †	males	females	males	females
C55 uterus, part unspecified	-	29	29		1,391		875
C56 ovary	-	371	371		106		66
C57 other and unspecified female genital organs	-	102	102		429		222
C56-57 ovary and other and unspecified female genital organs	-	473	473		86		52
C58 placenta	-	1	1				
C60 penis	50	-	50	795		488	
C61 prostate	4,067	-	4,067	9		6	
C62 testis	170	-	170	206		202	
C63 other and unspecified male genital organs	6	-	6	7,208		3,802	
C64 kidney, except renal pelvis	409	224	633	97	183	63	107
C65 renal pelvis	20	15	35	2,186	3,200	1,095	1,455
C66 ureter	19	13	32	3,169	4,077	1,060	1,507
C64-66 kidney incl. renal pelvis and ureter	448	252	700	90	166	56	94
C67 bladder	366	134	500	151	430	55	147
C67 (T0,T1,Ta,Tis), D090, D414 non-muscle invasive bladder cancer	477	144	621	101	291	46	157
C68 other and unspecified urinary organs	11	6	17	4,400	5,822	2,093	4,042
C69 eye and adnexa	37	26	63	1,045	1,425	674	1,046
C70 meninges	3	2	5	18,338	14,361	8,404	10,968
C71 brain	224	175	399	175	226	117	147
C71-72 brain & spinal cord	231	179	410	170	222	115	145
C72 spinal cord, cranial nerves and other parts of CNS	6	4	11	5,576	9,499	4,982	7,097
C73 thyroid	78	204	282	465	177	373	156
C74 adrenal gland	13	16	29	2,648	1,946	2,322	1,869
C75 other endocrine glands and related structures	7	7	13	5,549	5,510	4,442	4,009
C751-753 pituitary craniopharyngeal pineal brain	2	2	4				
C76 other and ill-defined sites	20	16	35	2,268	3,829	1,147	1,278
C80 malignant neoplasm without specification of site	249	217	466	218	258	81	92
C81 Hodgkin lymphoma	86	70	156	419	506	349	417
C82 follicular [nodular] non-Hodgkin lymphoma	108	105	213	378	364	230	237
C83 diffuse non-Hodgkin lymphoma	238	157	395	182	295	98	142
C84 peripheral and cutaneous T-cell lymphomas	46	25	71	940	1,838	518	936
C85 other and unspecified types of non-Hodgkin lymphoma	72	55	127	654	907	320	379
C82-86 non-Hodgkin lymphoma	463	342	805	93	128	51	67
C88 malignant immunoproliferative diseases	12	6	17	4,531	9,425	1,724	3,658
C90 multiple myeloma	219	148	367	199	296	104	151
C91 lymphoid leukaemia	193	114	306	215	356	128	206
C92 myeloid leukaemia	121	86	207	385	514	189	269
C93 monocytic leukaemia	3	2	4				
C94 other leukaemia of specified cell type	1	0	2				
C95 leukaemia of unspecified cell type	8	9	17	10,425	5,815	2,322	2,203
C91-95 leukaemia	325	211	536	135	201	73	110
C96 other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue	193	154	346	259	309	114	143
acute lymphoblastic leukaemia ALL ◊	26	20	46	1,435	1,653	1,167	1,568
acute myeloblastic leukaemia AML ◊	85	61	146	554	713	268	379
chronic lymphocytic leukaemia CLL ◊	143	77	220	307	561	162	277
chronic myeloid leukaemia CML ◊	36	24	60	1,165	1,893	666	959
D00 carcinoma in situ of oral cavity, oesophagus and stomach	20	21	41				
D01 carcinoma in situ of other and unspecified digestive organs	18	23	41				
D02 carcinoma in situ of middle ear and respiratory system	22	9	30				
D03 melanoma in situ	418	420	838				
D04 carcinoma in situ of skin	660	798	1,459				
D05 carcinoma in situ of breast	3	450	453				
D06 carcinoma in situ of cervix uteri	-	3,001	3,001				
D07 carcinoma in situ of other and unspecified genital organs	59	65	124				
D09 carcinoma in situ of other and unspecified sites	322	104	426				
D090 carcinoma in-situ of bladder	307	96	403				
D17 benign lipomatous neoplasm	0	1	1				
D18 haemangioma and lymphangioma, any site	3	1	5				
D32 benign neoplasm of meninges	43	128	171				
D32-D33 benign brain & CNS	57	148	205				
D33 benign neoplasm of brain and other parts of CNS	14	20	33				
D35 benign neoplasm of other and unspecified endocrine glands	43	36	79				
D352-354 benign pituitary craniopharyngeal pineal brain	43	36	79				
D37 neoplasm of uncertain or unknown behaviour of oral cavity and digestive organs	35	48	82				

3-year annual average 2020-2022: cases, risk of developing cancer before 75th birthday and lifetime risk

cancer	case count			risk # to age 75 1 in …		lifetime risk # 1 in …	
	males	females	all †	males	females	males	females
D38 neoplasm of uncertain or unknown behaviour of middle ear and respiratory and intrathoracic organs	8	5	13				
D39 neoplasm of uncertain or unknown behaviour of female genital organs	-	82	82				
D40 neoplasm of uncertain or unknown behaviour of male genital organs	4	-	4				
D41 neoplasm of uncertain or unknown behaviour of urinary organs	26	12	38				
D414 neoplasm of uncertain behaviour of bladder	19	8	27				
D42 neoplasm of uncertain or unknown behaviour of meninges	10	18	28				
D43 neoplasm of uncertain or unknown behaviour of brain and CNS	29	25	54				
D42-D43 neoplasm of uncertain meninges, brain & CNS	39	43	82				
C71-72,D32-33,D42-43 all brain and CNS	329	373	701				
D44 neoplasm of uncertain or unknown behaviour of endocrine glands	14	26	40				
D443-445 uncertain or unknown pituitary craniopharyngeal pineal brain	6	4	10				
D47 other neoplasms of uncertain or unknown behaviour of lymphoid, haematopoietic and related tissue	74	58	132				
D48 neoplasm of uncertain or unknown behaviour of other and unspecified sites	119	84	202				

† 3-year annual averages: male and female totals are subject to rounding.

◊ AML (ICD10: C920, C923–C926, C930, C940, C942, C944–C945), ALL (C910), CML (C921), CLL (C911) [18].

Cumulative risk of developing cancer was calculated using the current probability method [8]. Calculating the lifetime risk requires an estimate of incidence and mortality for the whole lifetime of individuals in a birth cohort using age-period-cohort modelling [19]. The lifetime risk to age 85+ (and risk up to age 75) probabilities in this report were obtained by applying the cancer incidence and the all-cause mortality rates at different ages in a particular year as if they were to apply to a cohort as they aged. The risk figures (e.g., 1 in 10) presented here should be viewed as approximations.

APPENDIX II: INCIDENT CANCER RATES

Age-standardised rate (ASR, per 100,000): annual average for 2020-2022. Incidence rate was calculated using two different age weights: 1976 and 2013 European standard populations (ESP).

Age-standardisation is one of the key methods to control for different age distributions among populations or over time. When comparing cancer incidence or mortality patterns between countries, regions or periods, variation in age and sex distribution can be misleading when looking at crude rates or case counts, and age-standardisation is recommended. The European population is ageing and Eurostat projections from 2008 to 2060 suggest that the age distribution will show a progressive shift to the older ages; the share of the population aged 65 and over is expected to increase in all countries and in particular the population aged 80 and over [20]. A task force for the revision of European Standard Population (ESP) (first published in 1976) recommended a more appropriate ESP for dissemination of public health statistics in the EU27, i.e. the '2013 ESP' [20]. Prior to the 2022 annual statistical report the NCRI routinely quoted cancer incidence and mortality rates using the 1976 ESP age weights in the main body of text, while quoting equivalent figures weighted by the 2013 ESP in appendices. As of 2022 we now quote rates adjusted using the 2013 ESP age weights in the main text while still retaining equivalent figures using the 1976 ESP in the appendices for continuity.

AGE-STANDARDISED INCIDENCE RATE (ASR, PER 100,000): ANNUAL AVERAGE FOR 2020-2022

	ESP 1976			ESP 2013		
	male	female	all	male	female	all
C00-96 all invasive cancers	625.0	498.7	557.9	957.9	712.4	826.1
C00-43, C45-96 all invasive cancers excl. NMSC	437.5	364.0	398.5	660.0	508.9	579.1
C00-96, D00-48 all registered tumours	733.4	729.2	727.2	1,140.7	984.3	1,051.4
D00-48 all non-malignant cancers	65.3	201.6	134.3	100.3	223.1	162.0
C00 lip	0.7	0.1	0.4	1.1	0.2	0.6
C01 base of tongue	1.4	0.4	0.9	1.8	0.5	1.1
C02 other and unspecified parts of tongue	2.1	1.1	1.6	2.9	1.4	2.1
C03 gum	0.4	0.3	0.3	0.5	0.5	0.5
C04 floor of mouth	1.2	0.4	0.8	1.6	0.6	1.1
C05 palate	0.7	0.3	0.5	0.9	0.4	0.7
C06 other and unspecified parts of mouth	0.8	0.5	0.6	1.2	0.8	1.0
C07 parotid gland	1.1	0.4	0.7	1.8	0.6	1.1
C08 other and unspecified major salivary glands	0.2	0.2	0.2	0.4	0.3	0.3
C09 tonsil	2.8	0.7	1.8	3.5	0.9	2.2
C10 oropharynx	1.1	0.3	0.7	1.5	0.4	0.9
C11 nasopharynx	0.5	0.1	0.3	0.7	0.1	0.4
C12 pyriform sinus	0.5	0.1	0.3	0.8	0.2	0.5
C13 hypopharynx	0.8	0.3	0.5	1.1	0.4	0.8
C14 other and ill-defined sites in the lip, oral cavity and pharynx	0.4	0.2	0.3	0.6	0.2	0.4
C15 oesophagus	12.2	4.5	8.2	19.1	7.5	13.0
C01-C06 and C09-C13 oral and pharyngeal cancer	12.3	4.4	8.3	16.4	6.0	11.1
C01-14 mouth and pharynx	14.0	5.2	9.5	19.2	7.1	12.9
C16 stomach	11.9	6.3	8.9	19.4	10.1	14.4
C17 small intestine	2.4	1.6	2.0	3.6	2.4	3.0
C18 colon	29.0	21.3	25.0	47.1	34.2	40.2
C19 rectosigmoid junction	3.8	2.1	2.9	5.8	3.3	4.4
C20 rectum	16.1	8.4	12.1	24.1	11.9	17.6
C21 anus	1.1	1.6	1.3	1.5	2.2	1.8
C19-20 rectum and rectosigmoid junction	19.9	10.5	15.0	29.8	15.1	22.0
C18-20 colorectal	48.3	31.4	39.5	76.3	48.9	61.7
C18-21 colorectal and anus	49.4	33.0	40.8	77.8	51.0	63.5
C22 liver and intrahepatic bile ducts	6.8	3.0	4.8	10.8	4.7	7.6
C23 gallbladder	0.5	1.1	0.8	0.8	1.8	1.3
C24 other and unspecified parts of biliary tract	3.6	2.7	3.1	6.2	4.5	5.3
C23-24 gallbladder and biliary tract	4.1	3.8	3.9	7.0	6.3	6.6
C25 pancreas	10.4	8.1	9.2	17.0	13.4	15.1
C26 other and ill-defined digestive organs	1.4	0.9	1.1	2.4	1.4	1.9
C30 nasal cavity and middle ear	0.5	0.2	0.3	0.7	0.3	0.5
C31 accessory sinuses	0.3	0.1	0.2	0.3	0.1	0.2

AGE-STANDARDISED INCIDENCE RATE (ASR, PER 100,000): ANNUAL AVERAGE FOR 2020-2022

	ESP 1976			ESP 2013		
	male	female	all	male	female	all
C32 larynx	5.3	1.0	3.1	7.9	1.3	4.4
C00-14, C30-32 head & neck	20.7	6.6	13.4	29.1	9.0	18.7
C33 trachea	0.0	0.0	0.0	0.1	0.0	0.0
C34 bronchus and lung	44.1	36.9	40.3	71.6	58.3	64.3
C34 non-small cell lung cancer (NSCLC)	39.1	31.3	34.9	64.0	50.0	56.4
C34 small cell lung cancer (SCLC)	5.0	5.6	5.3	7.7	8.3	8.0
C33-34 bronchus, lung and trachea	44.1	37.0	40.3	71.7	58.3	64.4
C37 thymus	0.3	0.2	0.2	0.4	0.2	0.3
C38 heart, mediastinum and pleura	0.5	0.2	0.3	0.8	0.2	0.5
C39 other and ill-defined sites, respiratory system and intrathoracic organs	-	0.0	0.0	-	0.0	0.0
C40 bone and articular cartilage of limbs	0.4	0.2	0.3	0.4	0.3	0.3
C41 bone and articular cartilage of other and unspecified sites	0.6	0.4	0.5	0.7	0.4	0.5
C43 melanoma of skin	22.3	20.8	21.4	34.0	27.8	30.4
C41-42 bone and articular cartilage of limbs and other and unspecified sites	0.6	0.4	0.5	0.7	0.4	0.5
C44 other malignant neoplasms of skin NMSC	187.5	134.7	159.5	297.9	203.5	247.0
C45 mesothelioma	1.0	0.4	0.7	2.0	0.6	1.2
C46 Kaposi sarcoma	0.3	0.0	0.2	0.3	0.0	0.2
C47 peripheral nerves and autonomic nervous system	0.1	0.1	0.1	0.1	0.0	0.1
C48 retroperitoneum and peritoneum	0.3	0.6	0.4	0.5	0.8	0.6
C49 other connective and soft tissue	4.5	2.5	3.4	6.8	3.1	4.8
C50 breast	1.0	121.2	62.6	1.6	157.1	82.1
C51 vulva	-	2.0	1.0	-	3.1	1.7
C52 vagina	-	0.6	0.3	-	0.8	0.4
C53 cervical adenocarcinoma	-	1.8	0.9	-	1.9	1.0
C53 cervical squamous cell carcinoma	-	6.9	3.5	-	7.5	3.9
C53 cervix uteri	-	9.2	4.7	-	10.1	5.2
C54 corpus uteri	-	19.0	9.7	-	26.0	13.4
C55 uterus, part unspecified	-	1.0	0.5	-	1.3	0.7
C56 ovary	-	12.4	6.4	-	16.7	8.7
C57 other and unspecified female genital organs	-	3.1	1.6	-	4.8	2.5
C56-57 ovary and other and unspecified female genital organs	-	15.5	8.0	-	21.5	11.2
C58 placenta	-	0.1	0.0	-	0.0	0.0
C60 penis	1.7	-	0.8	2.5	-	1.2
C61 prostate	138.7	-	67.5	202.4	-	97.7
C62 testis	6.9	-	3.4	6.6	-	3.2
C63 other and unspecified male genital organs	0.2	-	0.1	0.3	-	0.1
C64 kidney, except renal pelvis	14.2	7.2	10.6	20.0	10.2	14.9
C65 renal pelvis	0.7	0.4	0.5	1.1	0.7	0.9
C66 ureter	0.6	0.4	0.5	1.1	0.6	0.8
C64-66 kidney incl. renal pelvis and ureter	15.4	8.0	11.6	22.1	11.5	16.6
C67 bladder	11.6	3.8	7.4	20.7	6.4	12.9
C67 (T0,T1,Ta,Tis), D090, D414 non-muscle invasive bladder	15.5	4.4	9.6	25.7	6.8	15.5
C68 other and unspecified urinary organs	0.3	0.2	0.3	0.6	0.3	0.4
C69 eye and adnexa	1.3	0.9	1.1	1.8	1.1	1.4
C70 meninges	0.1	0.1	0.1	0.1	0.1	0.1
C71 brain	8.1	6.1	7.0	10.6	7.6	9.0
C71-72 brain & spinal cord	8.3	6.3	7.3	10.9	7.8	9.3
C72 spinal cord, cranial nerves and other parts of CNS	0.3	0.2	0.2	0.2	0.2	0.2
C73 thyroid	2.9	7.6	5.3	3.5	8.2	5.9
C74 adrenal gland	0.5	0.6	0.6	0.6	0.7	0.6
C75 other endocrine glands and related structures	0.3	0.2	0.3	0.3	0.3	0.3
C751-753 pituitary craniopharyngeal pineal brain	0.1	0.1	0.1	0.1	0.1	0.1
C76 other and ill-defined sites	0.7	0.5	0.6	1.0	0.7	0.9
C80 malignant neoplasm without specification of site	8.1	6.1	7.0	14.0	10.3	11.9
C81 Hodgkin lymphoma	3.3	2.7	3.0	3.6	2.8	3.2
C82 follicular [nodular] non-Hodgkin lymphoma	3.8	3.4	3.6	5.3	4.8	5.0
C83 diffuse non-Hodgkin lymphoma	8.0	4.8	6.3	12.2	7.3	9.6
C84 peripheral and cutaneous T-cell lymphomas	1.6	0.8	1.2	2.3	1.1	1.7
C85 other and unspecified types of non-Hodgkin lymphoma	2.4	1.6	2.0	3.7	2.6	3.1
C82-86 non-Hodgkin lymphoma	15.7	10.6	13.0	23.5	15.7	19.4
C88 malignant immunoproliferative diseases	0.4	0.2	0.3	0.7	0.3	0.4
C90 multiple myeloma	7.3	4.6	5.9	11.5	6.9	9.0
C91 lymphoid leukaemia	6.8	3.8	5.2	9.4	5.0	7.1

AGE-STANDARDISED INCIDENCE RATE (ASR, PER 100,000): ANNUAL AVERAGE FOR 2020-2022

	ESP 1976			ESP 2013		
	male	female	all	male	female	all
C92 myeloid leukaemia	4.2	2.8	3.4	6.2	3.9	4.9
C93 monocytic leukaemia	0.1	0.1	0.1	0.1	0.1	0.1
C94 other leukaemia of specified cell type	0.0	0.0	0.0	0.1	0.0	0.0
C95 leukaemia of unspecified cell type	0.2	0.3	0.2	0.5	0.4	0.4
C91-95 leukaemia	11.3	6.9	9.0	16.3	9.4	12.6
C96 other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue	6.4	4.7	5.5	10.3	7.1	8.5
acute lymphoblastic leukaemia ALL	1.0	0.9	1.0	1.0	0.7	0.9
acute myeloblastic leukaemia AML	2.9	2.0	2.4	4.4	2.8	3.5
chronic lymphocytic leukaemia CLL	4.8	2.3	3.5	7.4	3.6	5.4
chronic myeloid leukaemia CML	1.3	0.8	1.0	1.8	1.1	1.4
D00 carcinoma in situ of oral cavity, oesophagus and stomach	0.7	0.6	0.7	1.0	1.0	1.0
D01 carcinoma in situ of other and unspecified digestive organs	0.6	0.7	0.6	0.9	1.1	1.0
D02 carcinoma in situ of middle ear and respiratory system	0.7	0.3	0.5	1.1	0.4	0.7
D03 melanoma in situ	14.1	14.0	14.0	21.1	18.5	19.6
D04 carcinoma in situ of skin	21.6	22.8	22.3	35.1	38.1	36.7
D05 carcinoma in situ of breast	0.1	16.4	8.4	0.1	19.1	9.8
D06 carcinoma in situ of cervix uteri	-	122.4	62.2	-	114.1	58.0
D07 carcinoma in situ of other and unspecified genital organs	2.1	2.3	2.2	2.8	2.7	2.7
D09 carcinoma in situ of other and unspecified sites	10.5	3.3	6.7	17.1	4.8	10.5
D090 carcinoma in-situ of bladder	10.0	3.0	6.3	16.3	4.5	10.0
D18 haemangioma and lymphangioma, any site	0.1	0.1	0.1	0.1	0.1	0.1
D32 benign neoplasm of meninges	1.5	4.1	2.8	2.2	5.8	4.1
D32-D33 benign brain & CNS	2.0	4.9	3.5	2.8	6.6	4.8
D33 benign neoplasm of brain and other parts of CNS	0.5	0.7	0.6	0.6	0.8	0.7
D35 benign neoplasm of other and unspecified endocrine glands	1.5	1.3	1.4	2.0	1.5	1.8
D352-354 benign pituitary craniopharyngeal pineal brain	1.5	1.3	1.4	2.0	1.5	1.8
D37 neoplasm of uncertain or unknown behaviour of oral cavity and digestive organs	1.2	1.6	1.4	1.7	2.1	1.9
D38 neoplasm of uncertain or unknown behaviour of middle ear and respiratory and intrathoracic organs	0.3	0.1	0.2	0.4	0.2	0.3
D39 neoplasm of uncertain or unknown behaviour of female genital organs	-	3.0	1.5	-	3.4	1.7
D40 neoplasm of uncertain or unknown behaviour of male genital organs	0.2	-	0.1	0.2	-	0.1
D41 neoplasm of uncertain or unknown behaviour of urinary organs	0.9	0.4	0.6	1.3	0.6	0.9
D414 neoplasm of uncertain behaviour of bladder	0.7	0.2	0.4	1.0	0.4	0.7
D42 neoplasm of uncertain or unknown behaviour of meninges	0.4	0.6	0.5	0.5	0.8	0.6
D43 neoplasm of uncertain or unknown behaviour of brain and CNS	1.1	1.0	1.1	1.1	0.9	1.0
D42-D43 neoplasm of uncertain meninges, brain & CNS	1.5	1.6	1.6	1.6	1.7	1.6
C71-72,D32-33,D42-43 all brain and CNS	11.9	12.8	12.4	15.4	16.3	15.8
D44 neoplasm of uncertain or unknown behaviour of endocrine glands	0.5	0.9	0.7	0.6	1.1	0.9
D443-445 uncertain or unknown pituitary craniopharyngeal pineal brain	0.2	0.2	0.2	0.3	0.2	0.2
D47 other neoplasms of uncertain or unknown behaviour of lymphoid, haematopoietic and related tissue	2.5	1.8	2.1	3.9	2.7	3.2
D48 neoplasm of uncertain or unknown behaviour of other and unspecified sites	4.1	3.0	3.5	6.3	3.4	4.6

APPENDIX III: MORTALITY

3-YEAR ANNUAL AVERAGE DEATHS (2020-2022) AND RISK OF DYING OF CANCER BEFORE 75TH BIRTHDAY

	deaths			# risk of cancer death before 75th birthday	
cancer	male	female	all●	male	female
C00-97, D00-48 all registered tumours	5,375	4,666	10,041	11	12
C00-97 all invasive cancers	5,246	4,551	9,797	11	12
C00-43, C45-96 all invasive cancers excl. NMSC	5,175	4,523	9,699	11	12
C01-14 mouth and pharynx	142	56	198	295	1,120
C01-C06 and C09-C13 oral and pharyngeal cancer	112	44	156	346	1,304
C15 oesophagus	309	129	438	150	505
C16 stomach	192	106	298	314	549
C17 small intestine	18	15	33	2,768	4,015
C18 colon	225	198	423	270	398
C19-20 rectum and rectosigmoid junction	353	236	589	155	240
C18-20 colorectal	578	434	1,012	99	150
C21 anus	8	9	17	5,999	5,361
C22 liver and intrahepatic bile ducts	264	165	429	191	344
C23 gallbladder	10	31	40	5,850	2,041
C23-24 gallbladder and biliary tract	29	47	76	1,785	1,296
C25 pancreas	310	293	603	165	204
C26 other and ill-defined digestive organs	67	60	127	1,199	1,995
C32 larynx	60	11	71	765	3,615
C00-14, C30-32 head & neck	206	72	278	210	809
C34 bronchus and lung	1,066	884	1,950	46	56
C41-42 bone and articular cartilage of limbs and other and unspecified sites	14	9	23	3,151	4,986
C43 melanoma of skin	106	67	174	532	867
C44 other malignant neoplasms of skin NMSC	71	27	98	1,138	4,453
C45 mesothelioma	36	11	47	2,283	3,679
C48 retroperitoneum and peritoneum	6	11	16	12,459	11,242
C49 other connective and soft tissue	34	27	61	1,691	1,536
C50 breast	8	753	762	6,693	71
C51 vulva	-	23	23		3,298
C52 vagina	-	5	5		9,816
C53 cervix uteri	-	80	80		476
C54 corpus uteri	-	118	118		486
C56 ovary	-	294	294		160
C56-57 ovary and other and unspecified female genital organs	-	306	306		154
C60,C63 penis and other unspecified male genital organs	11	-	11	5,688	
C61 prostate	620	-	620	169	
C62 testis	5	-	5	8,197	
C64 kidney, except renal pelvis	147	79	227	382	844
C66 ureter	3	2	6	40,362	38,318
C67 bladder	159	77	236	612	1,427
C69 eye and adnexa	6	2	8	8,824	16,587
C71-72 brain & spinal cord	192	124	316	215	326
C71-72,D32-33,D42-43 all brain and CNS	217	153	370	199	297
C73 thyroid	13	12	25	4,026	4,889
C76 other and ill-defined sites	23	17	40	1,858	8,059
C80 malignant neoplasm without specification of site	216	199	414	286	348
C81 Hodgkin lymphoma	10	12	21	5,981	5,948
C82-86 non-Hodgkin lymphoma	159	124	283	420	593
C90 multiple myeloma	106	74	180	657	1,061
C91-95 leukaemia	183	103	286	357	645
D00-48 all non-malignant cancers	129	116	245	759	970
D32-D33 benign brain & CNS	10	13	22	6,121	7,956

Source of data: VSA29, 31/10/2024, Central Statistics Office, Ireland [12].

● 3-year annual averages: (i.e., male + female) deaths are subject to rounding

risk of dying of cancer before 75th birthday calculated using the cumulative risk method [13]: 1 in […], e.g. 1 in 11 risk for males of dying of an invasive cancer (C00-97) before 75th birthday during the period 2020-2022.

APPENDIX IV: MORTALITY RATES

Age-standardised mortality rate (ASMR, per 100,000): annual average for 2020-2022. Mortality rate was calculated using two different age weights: 1976 and 2013 European Standard Populations (ESP) [20].

AGE-STANDARDISED MORTALITY RATE (ASMR PER 100,000): ANNUAL AVERAGE 2020-2022

	ESP 1976		ESP 2013	
cancer	males	females	males	females
C00-97, D00-48 all registered tumours	172.6	131.3	309.6	222.5
C00-97 all invasive cancers	168.6	128.5	301.4	216.9
C00-43, C45-96 all invasive cancers excl. NMSC	166.3	127.9	296.9	215.6
C01-14 mouth and pharynx	4.8	1.6	7.3	2.7
C01-C06 and C09-C13 oral and pharyngeal cancer	3.8	1.2	5.6	2.1
C15 oesophagus	10.2	3.4	16.7	6.3
C16 stomach	6.1	3.0	11.0	5.1
C17 small intestine	0.6	0.4	1.0	0.7
C18 colon	7.3	5.2	13.3	9.6
C19-20 rectum and rectosigmoid junction	11.4	6.7	20.0	11.2
C18-20 colorectal	18.7	11.9	33.3	20.8
C21 anus	0.2	0.3	0.5	0.4
C22 liver and intrahepatic bile ducts	8.4	4.6	14.5	7.9
C23 gallbladder	0.3	0.8	0.5	1.5
C23-24 gallbladder and biliary tract	0.9	1.3	1.6	2.3
C25 pancreas	10.0	8.0	17.2	14.2
C26 other and ill-defined digestive organs	2.1	1.5	4.2	2.9
C32 larynx	2.0	0.3	3.2	0.5
C00-14, C30-32 head & neck	6.9	2.0	10.9	3.4
C34 bronchus and lung	34.3	25.3	58.7	42.6
C41-42 bone and articular cartilage of limbs and other and unspecified sites	0.5	0.3	0.7	0.4
C43 melanoma of skin	3.5	1.9	6.2	3.1
C44 other malignant neoplasms of skin NMSC	2.3	0.7	4.6	1.3
C45 mesothelioma	1.0	0.3	2.1	0.5
C48 retroperitoneum and peritoneum	0.2	0.3	0.3	0.5
C49 other connective and soft tissue	1.2	0.9	1.8	1.2
C50 breast	0.3	22.2	0.5	35.1
C51 vulva	-	0.6	-	1.1
C52 vagina	-	0.1	-	0.3
C53 cervix uteri	-	2.7	-	3.5
C54 corpus uteri	-	3.3	-	5.6
C56 ovary	-	8.7	-	13.9
C56-57 ovary and other and unspecified female genital organs	-	9.1	-	14.4
C60, C63 penis and other unspecified male genital organs	0.4	-	0.6	-
C61 prostate	19.2	-	40.7	-
C62 testis	0.2	-	0.2	-
C64 kidney, except renal pelvis	4.8	2.1	8.3	3.8
C66 ureter	0.1	0.1	0.2	0.1
C67 bladder	4.9	1.9	10.2	3.7
C69 eye and adnexa	0.2	0.1	0.3	0.1
C71-72 brain & spinal cord	6.7	4.0	9.4	5.6
C71-72,D32-33,D42-43 all brain and CNS	7.5	4.8	10.9	7.0
C73 thyroid	0.4	0.3	0.7	0.6
C76 other and ill-defined sites	0.8	0.4	1.3	0.8
C80 malignant neoplasm without specification of site	6.9	5.3	12.8	9.6
C81 Hodgkin lymphoma	0.3	0.3	0.6	0.6
C82-86 non-Hodgkin lymphoma	4.9	3.2	9.4	6.1
C90 multiple myeloma	3.3	1.9	6.3	3.6
C91-95 leukaemia	5.7	2.8	10.8	5.0
D00-48 all non-malignant cancers	4.0	2.8	8.1	5.6
D32-D33 benign brain & CNS	0.3	0.3	0.6	0.6
D42-D43 neoplasm of uncertain meninges, brain & CNS	0.5	0.4	0.9	0.8

APPENDIX V: PREVALENCE

ESTIMATED COMPLETE PREVALENCE BY CANCER SITE, SEX AND AGE: NUMBER OF CANCER SURVIVORS ON 31/12/2022

cancer	females			males			M&F total
	<50	50+	all*	<50	50+	all*	
C00-43, C45-96 all invasive cancers excl. NMSC	17,392	96,592	113,984	10,914	95,829	106,744	220,728
C00-14, C30-32 head & neck	233	1,502	1,735	357	3,694	4,051	5,786
C15 oesophagus	21	477	498	49	951	1,000	1,498
C16 stomach	90	904	994	87	1,332	1,419	2,413
C18-20 colorectal	542	9,008	9,550	522	11,477	11,998	21,549
C22 liver and intrahepatic bile ducts	41	165	207	66	416	482	689
C25 pancreas	73	388	462	35	412	447	909
C34 bronchus and lung	172	3,395	3,568	142	2,918	3,060	6,628
C43 melanoma of skin	1,897	7,326	9,223	952	5,277	6,230	15,453
C50 breast	5,218	43,829	49,047	12	232	244	49,290
C53 cervix uteri	1,811	3,236	5,047				5,047
C54 corpus uteri	259	6,103	6,362				6,362
C56-57 ovary and other and unspecified female genital organs	524	2,820	3,343				3,343
C61 prostate				374	46,037	46,411	46,411
C62 testis				2,679	2,654	5,333	5,333
C64 kidney, except renal pelvis	342	1,909	2,252	436	3,080	3,517	5,768
C67 bladder	34	1,101	1,135	51	2,573	2,625	3,760
C71-72 brain & spinal cord	553	527	1,079	622	547	1,169	2,248
C73 thyroid	1,285	1,726	3,011	305	570	875	3,886
C81 Hodgkin lymphoma	843	670	1,513	865	851	1,716	3,228
C82-86 non-Hodgkin lymphoma	520	3,505	4,025	754	3,872	4,627	8,651
C90 multiple myeloma	44	791	835	71	1,153	1,224	2,059
C91-95 leukaemia	878	1,726	2,604	983	2,654	3,637	6,241

*age <50 and 50+ and M&F summations are subject to rounding.

APPENDIX VI: OBSERVED VS. PROJECTED CANCER INCIDENCE, 2022

sex	cancer	registered 2022	projected 2022	95% projection Interval (PI)	% change	registered relative to PI
Male	**C00-43, C45-96 all invasive cancers excl. NMSC**	**13,654**	**13,886**	**13332-14439**	**-2%**	**expected**
Male	C00-14, C30-32 head & neck	593	656	611-701	-10%	lower
Male	C15 oesophagus	385	338	294-381	14%	higher
Male	C16 stomach	378	321	189-452	18%	expected
Male	C18-20 colorectal	1,578	1,595	1491-1699	-1%	expected
Male	C22 liver and intrahepatic bile ducts	201	357	317-397	-44%	lower
Male	C25 pancreas	301	356	314-397	-15%	lower
Male	C34 bronchus and lung	1,353	1,590	1522-1658	-15%	lower
Male	C43 melanoma of skin	752	614	456-772	22%	expected
Male	C61 prostate	4,516	4,786	4637-4935	-6%	lower
Male	C62 testis	175	163	140-187	7%	expected
Male	C64 kidney, except renal pelvis	438	503	437-569	-13%	expected
Male	C67 bladder	368	332	289-374	11%	expected
Male	C71-72 brain & spinal cord	215	254	227-281	-15%	lower
Male	C73 thyroid	73	81	32-130	-10%	expected
Male	C81 Hodgkin lymphoma	75	97	78-116	-23%	lower
Male	C82-86 non-Hodgkin lymphoma	482	567	526-608	-15%	lower
Male	C90 multiple myeloma	196	230	196-264	-15%	expected
Male	C91-95 leukaemia	332	394	352-436	-16%	lower
sex	**cancer**	**registered 2022**	**projected 2022**	**95% projection Interval (PI)**	**% change**	**registered relative to PI**
Female	**C00-43, C45-96 all invasive cancers excl. NMSC**	**11,886**	**12,224**	**11983-12464**	**-3%**	**lower**
Female	C00-14, C30-32 head & neck	220	234	201-267	-6%	expected
Female	C15 oesophagus	166	158	132-183	5%	expected
Female	C16 stomach	221	204	172-237	8%	expected
Female	C18-20 colorectal	1,106	1,164	1096-1232	-5%	expected
Female	C22 liver and intrahepatic bile ducts	107	148	129-167	-28%	lower
Female	C25 pancreas	267	319	285-353	-16%	lower
Female	C34 bronchus and lung	1,263	1,307	1129-1485	-3%	expected
Female	C43 melanoma of skin	711	749	682-816	-5%	expected
Female	C50 breast	4,054	3,824	3538-4109	6%	expected
Female	C53 cervix uteri	249	256	186-326	-3%	expected
Female	C54 corpus uteri	586	670	609-731	-13%	lower
Female	C56-57 ovary and other and unspecified female genital organs	404	485	438-532	-17%	lower
Female	C64 kidney, except renal pelvis	249	295	264-325	-16%	lower
Female	C67 bladder	130	117	86-149	11%	expected
Female	C71-72 brain & spinal cord	155	184	155-214	-16%	expected
Female	C73 thyroid	184	180	109-251	2%	expected
Female	C81 Hodgkin lymphoma	55	79	62-96	-30%	lower
Female	C82-86 non-Hodgkin lymphoma	371	351	250-453	6%	expected
Female	C90 multiple myeloma	139	152	119-185	-9%	expected
Female	C91-95 leukaemia	199	243	199-287	-18%	expected
sex	**cancer**	**registered 2022**	**projected 2022**	**95% projection Interval (PI)**	**% change**	**registered relative to PI**
M&F	**C00-43, C45-96 all invasive cancers excl. NMSC**	**25,540**	**26,106**	**25430-26781**	**-2%**	**expected**
M&F	C00-14, C30-32 head & neck	813	902	840-964	-10%	lower
M&F	C15 oesophagus	551	580	549-610	-5%	expected
M&F	C16 stomach	599	513	387-640	17%	expected
M&F	C18-20 colorectal	2,684	2,702	2578-2825	-1%	expected
M&F	C22 liver and intrahepatic bile ducts	308	505	454-555	-39%	lower
M&F	C25 pancreas	568	674	618-730	-16%	lower
M&F	C34 bronchus and lung	2,616	2,918	2779-3058	-10%	lower
M&F	C43 melanoma of skin	1,463	1,239	953-1526	18%	expected
M&F	C64 kidney, except renal pelvis	687	788	692-884	-13%	lower
M&F	C67 bladder	498	465	404-525	7%	expected
M&F	C71-72 brain & spinal cord	370	438	399-477	-15%	lower
M&F	C73 thyroid	257	242	123-361	6%	expected
M&F	C81 Hodgkin lymphoma	130	175	145-206	-26%	lower
M&F	C82-86 non-Hodgkin lymphoma	853	857	775-938	0%	expected
M&F	C90 multiple myeloma	335	381	329-433	-12%	expected
M&F	C91-95 leukaemia	531	600	518-681	-11%	expected

Interpretation: Based on the last stable trend in incident cases (up to 2019), for each cancer type the projected number of cases was calculated for 2022 (assuming COVID-19 pandemic never occurred). The column (*'% change*') represents the complement of the number of registered cases in 2021 expressed as a percentage of projected number of cases for 2022, i.e. [(registered cases

2022/projected cases 2022)-1]*100. For *all invasive cancers excluding NMSC*, for both sexes combined, the estimated % change (or *shortfall)* in expected cases for 2022 was 2% (2% for males; 3% for females) – within the projected range for both sexes combined and males, and marginally below the projected range for females.