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Public Investment in Cancer
Care in Ireland

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Séanadh

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Key Messages

Overview of Cancer Services in Ireland

- Demographic changes will drive the incidence of cancer, and subsequently, will increase the level of investment required for cancer care over the coming years. In addition, the high cost of new effective medicines, price inflation, potential future policy changes to expand and improve services, and public sector pay agreements will also drive the level of investment required.
- The structure and delivery of cancer services are highly centralised, primarily being organised and delivered through the Health Service Executive. However, others such as General Practitioners and voluntary agencies also play an important role in the delivery of services.

Cancer Care Spending in Ireland

- Investment will be required to maintain existing levels of services and quality, and to expand and develop cancer services as per the National Cancer Strategy 2017-2026.
- No official aggregate data on public health spending on cancer is available in Ireland. It is estimated that spending exceeds one billion euro.
- It is not possible to determine the total level of investment in, or spending on, cancer services or the various elements of service provision. This presents challenges in examining the overall national level of spending on cancer care.
- Spending on approved hospital-administered cancer medicines via the Oncology Drug Management System has increased from €4.7 million in 2013 to €151 million in 2022 – an increase of over 3000%.
- Currently, it is not possible to comprehensively link investment in cancer services with performance or outcomes, due to the lack of data. As a result, it is not possible to analyse investment within a performance-budgeting framework.
- While allocating resources according to service or care area may not be feasible, the ability to track spending by service level would provide a number of benefits, including a better understanding of Ireland's performance and health outcomes, improved oversight over public health investment, capacity to better identify drivers of

healthcare spending, and an enhanced evidence-base to inform policy and planning.

Epidemiology of Cancer in Ireland

- In Ireland, the incidence of cancer, in general, has been increasing over recent years. This has been attributed to a number of causes, including demographic change, increases in risk factors, and the impact of screening.
- The incidence (number of cases) of invasive cancer (excluding non-melanoma skin cancer), in general, in Ireland has almost doubled since the late 1990s, rising from around 13,000 diagnosed cases in 1999 to over 25,000 diagnosed cases in 2019. Over the same period, the incidence rate (number of cases per 100,000 population) of invasive cancer (excluding non-melanoma skin cancer) in Ireland has increased from 555 in 1990 to 649 in 2019.
- While the numbers of people dying from cancer, in general, has increased, the overall cancer mortality rate has declined. The number of people living after an invasive cancer diagnosis is up 50% compared with one decade ago.
- Reduced mortality in the context of increased incidence reflects the improvements made in diagnosing and treating cancer to improve patient outcomes and reduce fatality from the disease. This highlights the benefits of investments made in screening programmes, high-tech medicine arrangements and service developments.

Acknowledgements

The Parliamentary Budget Office would like to thank colleagues in the National Cancer Registry for providing detailed epidemiological statistics, and colleagues in the Health Service Executive and the Department of Health who provided responses to PBO queries regarding investment in cancer services, while acknowledging that we are solely responsible for the analyses and interpretations within this report.

Glossary of Terms

ASR	Age-standardised rate
EU14	EU member states who joined prior to 2004
EU27	EU member states
Incidence	Number of cancer cases diagnosed.
Incidence Rate	Number of cancer cases diagnoses per 100,000 people.
Mortality	Number of deaths
Mortality rate	Number of deaths per 100,000 people
NCCP	HSE National Cancer Control Programme, works with healthcare providers to prevent and treat cancer, and increase survival and quality of life of those who develop cancer
NCRI	National Cancer Registry Ireland, has statutory responsibility to collect and classify information on all cancer cases which occur in Ireland
NMSC	Non-melanoma skin cancer
NSS	HSE National Screening Service, responsible for the management and delivery of four national population screening programmes, three of which screen for cancer
ODMS	Oncology Drugs Management System, used by HSE NCCP to oversee and manage the funding of specified hospital-administered anti-cancer drug treatments to public hospitals
Oncology	Branch of medicine which is interested in cancer.
Palliative Care	Treatment which improves the quality of life of people facing the problems associated with life-limiting illness and supports their families
PCRS	HSE Primary Care Reimbursement Service, responsible for making payments to healthcare professionals for the cost of free or subsidised services provided to members of the public

1. Introduction

1.1 Background

Significant advances have been made in diagnosing and treating cancer in Ireland over recent decades.¹ Meanwhile, the incidence of cancer (number of cases) in Ireland has grown and is expected to continue to increase. These increases will largely be driven by demographic factors, such as population ageing and population growth.²

These demographic changes will mean older people, who have a greater risk of getting cancer, will make up a greater proportion of the population. Therefore, it can be reasonably expected this will cause an increase in the demand for cancer treatments. In turn, this puts a greater onus on the public healthcare system to prevent and diagnose cancer earlier, which necessitates additional investment in cancer services across the public healthcare system. Such investment will be required not only to maintain existing levels of service and quality, but also to expand and develop cancer services further as per the National Cancer Strategy 2017-2026 to improve access, treatment, and patient outcomes.³

The association between demographic change and pressure on the healthcare system has been widely acknowledged.^{4,5,6} Figure 1 below demonstrates the distribution of the population by age in 2022 and 2040 (projected) and highlights how older individuals will comprise a greater share of the population by 2040.

¹ Department of Health (2017) [National Cancer Strategy 2017 – 2026](#).

² National Cancer Registry (2019) [Cancer Incidence Projections for Ireland 2020-2045](#).

³ Department of Health (2017) [National Cancer Strategy 2017 – 2026](#).

⁴ Parliamentary Budget Office (2019) [The Effect of Changing Demographics on Irish Health Expenditure – An Analysis of Different Approaches and Findings](#).

⁵ Lindberg, C. & McCarthy, T. (2021) [Impact of Demographic Change on Health Expenditure 2022-2025](#).

⁶ OECD (2022) [OECD Economic Surveys: Ireland 2022](#).

Figure 1. Population Distribution by 5-year Age Group 2022 (left) and 2040 (projected) (right)



Sources: Central Statistics Office, Table [F3027 Population](#) (2022) and [PEA22 Projected Population 2016 Based](#) (2040) (accessed 4 December 2023).

Note: 2040 projections are based on CSO M2F2 scenario. This is the approximate central estimate of the range of CSO migration (M) and fertility (F) scenarios.

1.2 Availability of Data

There is very limited official and publicly available data on investment in oncology services within the Irish public healthcare system. This lack of data makes it impossible to understand the levels of investment or spending on oncology services, and other services provided within the public healthcare system. The limited data which is available is a clear understatement of total investment, presenting just a fraction of the estimated aggregate amount. The Parliamentary Budget Office (PBO) made requests for cancer-specific budget and spending data to the Department of Health and Health Service Executive (HSE).

The PBO were advised that due the limitations of the HSE's financial systems, service level spending data for cancer services is not available. While limited data was available, such as that on recently announced investments, the PBO were made aware that it may be difficult to establish the overall current spending or budget allocated to cancer services. As such, it is not possible for the PBO to determine either a comprehensive breakdown of investment or an aggregated total. This absence of spending data or estimates presents a number of challenges, as discussed in Section 3.

The PBO notes that an Integrated Financial Management System was first planned in 2013. This system intends to unify the multiple, fragmented, non-standard finance systems into a single financial management system. However, it is not yet known whether the new system will provide data such as aggregate data on cancer spending or spending per cancer programme.

Building on existing data, it should be possible for the HSE to develop a system for attributing costs to specific major illness groups (such as cancers) by linking costs for staffing (e.g., oncologists), services, goods, and assets attributed entirely or primarily to those illnesses. This recognises that patient needs may overlap services and may not always be clearly attributable to specific illnesses (e.g., cancer patients may require anti-nausea medications which are not necessarily specific in their application).

At present, the best available estimate of spending on cancer in Ireland suggests the direct costs in 2018 totalled approximately €1.14 billion (inclusive of public and private sources).⁷ While this figure is used by both the European Commission and the OECD, there are issues associated with it (discussed in section 3).⁸ Direct costs refer to those experienced by healthcare providers for provision of care services (e.g., administration costs, salaries, medicines, etc.), as well as on prevention programmes. While informal care provided by relatives and friends of patients can also be regarded as a direct cost, it was not considered as part of the aforementioned estimate.⁹ As noted previously, **demographic changes will drive the incidence of cancer, and subsequently, will increase the level of investment required over the coming years. In addition, the high cost of new effective medicines, price inflation, potential future policy changes to expand and improve services, and public sector pay agreements will also drive the level of investment required.** In the more immediate term, additional cost pressures now likely exist due to the decrease in cancer scans and diagnoses during the COVID-19 pandemic, as cancers are more complex and expensive to treat as they progress.¹⁰ The potential for improved productivity and efficiency, as highlighted by the Department of Health, can complement investment but are unlikely to be sufficient to contain the need for additional spending.¹¹

⁷ Hofmarcher, T. et al. (2019) [Comparator Report on Cancer in Europe 2019 – Disease Burden, Costs and Access to Medicines](#).

⁸ European Commission & OECD (2023) [Ireland: Country Cancer Profile 2023](#).

⁹ Hofmarcher, T., Ericson, O. & Lindgren, P. (2022) [Comparator Report on Cancer in Ireland – Disease Burden, Costs and Access to Medicines](#).

¹⁰ National Cancer Registry Ireland (2023) [Cancer in Ireland 1994 – 2021: Annual statistical report of the National Cancer Registry](#).

¹¹ Department of Health (2024) [Health Minister announces establishment of Productivity and Savings Taskforce](#).

1.3 Purpose of this report

Initially, the PBO set out to identify spending across various aspects of public cancer care in Ireland, with the aim of identifying an aggregated figure. However, as noted previously this is not possible due to the absence of required data. Therefore, this report aims to outline:

- The scale and structure of public cancer care services in Ireland,
- The limited available public data and infrastructure which may form the basis of comprehensive cost-of-illness studies in future, and
- The current epidemiology of cancer (incidence, mortality, survival) in Ireland and how this has trended since 1999.

The scale of public services and current (and future projected) epidemiological situation highlight the importance of investing in public cancer care services and of developing an approach which can account for disease-specific spending in relation to cancer and other categories of diseases and health conditions. Such data can help to identify key drivers of healthcare spending and areas which require additional investment, and what the required level of additional investment may be to maximise health outcomes for the public.

It is important to note that this report does not seek to evaluate the efficacy of public cancer care services. Epidemiological data is provided solely to highlight the need for a better understanding of investment in services and how public monies are spent to ensure the best outcomes and value for money possible are achieved in future.

The remainder of this paper is structured as follows:

- Sections 1.4 and 1.5 will provide definitions of cancer and cancer-specific public health spending respectively,
- Section 2 provides an overview of the structure and scale of cancer services in Ireland,
- Section 3 presents limited data on cancer-specific public health spending and highlights the limitations this poses on budgetary oversight and enhanced planning and distribution of resources,
- Section 4 provides an overview of the epidemiological situation in Ireland in relation to cancer, namely incidence, mortality and survival rates and compares this with other EU member states,
- Section 5 contains the conclusion.

1.4 Definition of 'Cancer'

The term 'cancer' refers to a group of diseases which can affect any part of the body.¹² Cancer can be defined by the rapid growth of abnormal cells in the body which can invade and destroy other cells, and which may also spread to other parts of the body. Cancer may also be referred to as a 'neoplasm' or 'malignant tumour'.

Cancer and types of cancer are classified in the International Classification of Diseases (ICD-10), which is used by National Cancer Registry and CSO to measure incidence and mortality rates. Cancer also includes both malignant and non-malignant neo-plasms.¹³

1.5 Cancer-specific public health spending

For the purposes of this paper, spending on cancer care is defined as the total costs of all resources used within the public health care system, inclusive of costs associated with prevention, screening, diagnosis, and treatment. As such, the focus of this paper is on public resources which are financed from public sources such as taxation. This definition is broadly aligned to the Swedish IHE definition of 'direct costs' but adjusted to reflect the context of public healthcare and health service financing in Ireland.¹⁴ This definition does not include tax expenditures, private/household spending such as insurance premium payments and other costs borne by patients and those who may provide informal care.

¹² World Health Organisation (2023) <https://www.who.int/news-room/fact-sheets/detail/cancer> (accessed 1 December 2023).

¹³ World Health Organisation (2019) [International Classification of Diseases Version:2019](#).

¹⁴ Hofmarcher, T., Ericson, O. & Lindgren, P. (2022) [Comparator Report on Cancer in Ireland – Disease Burden, Costs and Access to Medicines](#).

2. Overview of Cancer Services in Ireland

2.1 Organisation of public cancer services

This section and subsequent sections are intended to outline how public cancer services are organised and delivered in Ireland, and to highlight the scale of service delivery. While it is possible to set out the key elements of cancer care in the Irish public healthcare system, the previously mentioned data limitations mean the PBO cannot identify the exact level of funding or spending associated with each element for the delivery of cancer care.

Public cancer services in Ireland are principally organised and delivered by the HSE. These HSE units also fund voluntary organisations to provide services to the public, at no cost to the patient. Cancer treatment services are highly centralised. Responsibility for delivering cancer services from prevention to diagnosis, treatment to survivorship supports, is distributed across a range of key HSE units and programmes, including:

- Acute Operations
- Palliative Care
- Health & Wellbeing
- National Cancer Control Programme
- Primary Care Reimbursement Service
- National Screening Service
- Overseas Treatment

The HSE is supported by an array of professionals and organisations in the delivery of public cancer services. The National Cancer Strategy recognises that General Practitioners (GPs) play a valuable role in referring patients onwards for diagnostic testing. The strategy also notes a requirement to expand the role of GPs in this regard.¹⁵ Furthermore, it acknowledges a desire to expand the involvement of GPs across the cancer care continuum. Community pharmacists also play an important role in dispensing medication and advice. The voluntary sector also delivers services from prevention through to survivorship supports.

This section is intended only to provide an overview of the scope and scale of services involved in the delivery of cancer services. It does not detail the full array of inputs and resources which are vital to the delivery of these services, namely:

- Staffing including from medical (doctors, nurses) to administration, catering to allied health (such as medical

¹⁵ Department of Health (2017) [National Cancer Strategy 2017 – 2026](#).

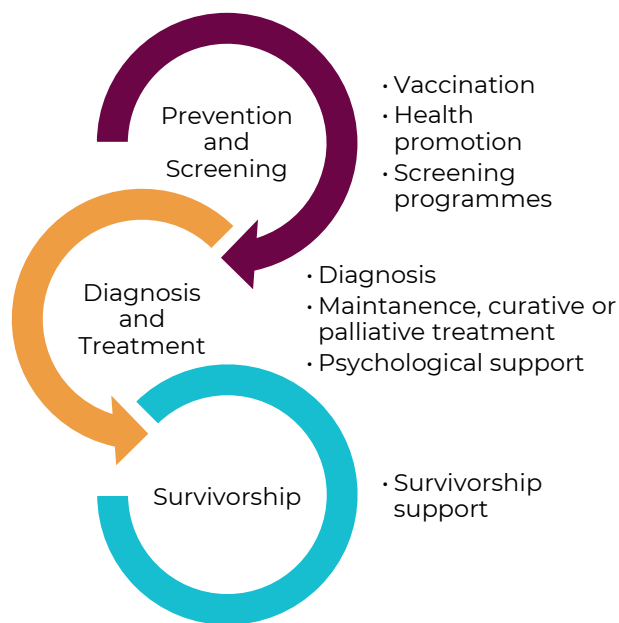
scientists, dietitians, radiographers, physiotherapists, pharmacists, psychologists),

- Drugs and medical equipment, and
- Overhead costs.

These are essential to ensuring services are maintained at high quality.

Figure 2 illustrates the key public health interventions to prevent, diagnose, and treat cancer, and to support people affected by cancer. Please note this figure and subsequent sections summarise key aspects of the care pathway and key interventions; these are not intended to be interpreted as a model of care or stage-by-stage process.

Figure 2. Overview of key Public Health Interventions for Cancer Prevention and Care



2.2 Prevention and Screening

As part of the delivery of cancer services in Ireland’s public healthcare system, a range of different interventions and programmes are employed to inform, prevent, identify and treat cancers amongst the general public. This section sets out the various public health interventions which aim to prevent cancer among the population or facilitate early-diagnosis and reduce cancer fatality. The key interventions include vaccination, health promotion campaigns, and population-level screening services. These operate through protecting at-risk individuals against developing cancer, increasing public awareness, changing attitudes and behaviours to reduce risk, and screening to identify those at risk of developing cancer. Each of these interventions has a vitally important role that addresses cancer at different stages of development, with earlier detection being the most cost

effective to address, while treating at later stages proving to be more costly.

2.2.1 Vaccination

A vaccine is a substance which is manufactured using part of a germ or virus and which is used to protect a person against a specific disease or set of diseases.¹⁶ Vaccines have been proven to be a safe and effective way to prevent diseases from causing harm to people. Vaccines offer a cost-effective way to prevent some cancers in specific at-risk population groups. Currently, the HSE offers two vaccines to certain groups in the population which can protect against infections known to cause cancer, namely HPV and hepatitis B. Further information is outlined in table 1 below.

Recently published data in the Irish Journal of Medical Science indicates that the HPV vaccine is demonstrating a protective effect in women at the time of their first cervical screening test.¹⁷ This suggests that the vaccine will lead to a reduction in the incidence of cervical cancer over time.

¹⁶ Health Service Executive, [Vaccines](#) (accessed 1 December 2023).

¹⁷ Rourke, M. et al. (2023) [The effect of HPV vaccination on the rate of high-grade cytology in 25-year-old women attending cervical screening in Ireland.](#)

Table 1. Infections associated with Cancer against which Vaccines are offered by the HSE

Infection	Associated Cancers	Vaccine Eligibility
HPV	<ul style="list-style-type: none"> ▪ Cervical ▪ Vulval ▪ Vaginal ▪ Anal ▪ Mouth and throat ▪ Penis 	<ul style="list-style-type: none"> ▪ Secondary school students ▪ Young adults ▪ People living with HIV ▪ Gay, bisexual and other men who have sex with men
Hepatitis B	<ul style="list-style-type: none"> ▪ Liver 	<ul style="list-style-type: none"> ▪ Infants aged 2-6 months ▪ Intravenous drug users ▪ Close contacts of people infected with hepatitis B ▪ People who change sexual partners ▪ Gay, bisexual and other men who have sex with men ▪ Individuals at high risk due to medical conditions ▪ Health care professions ▪ Gardaí and Rescue Service personnel ▪ Prison services staff and employees of security companies ▪ People with a learning disability who attend an institution ▪ Families adopting or fostering children from countries where hepatitis B is very common ▪ People travelling to countries where hepatitis B is very common

Sources: HSE, [HPV \(human papillomavirus\)](#); and HSE, [Hepatitis B: Adult Vaccines](#) (accessed 6 August 2023).

2.2.2 Health promotion communication campaigns

The HSE delivers a range of public health communication campaigns with a view to improving the health of the population. These campaigns are educational in nature and involve advertising across a range of mediums to make the public aware of certain actions they can take or reduce to protect and improve their health. Many of these campaigns focus on

cancer prevention through a range of healthy behaviours (e.g., quitting cigarette smoking, reducing or stopping alcohol consumption) and screening, either directly or indirectly. The intention of these information campaigns is to raise awareness around the health impacts of different behaviours or to increase education amongst the public, with the aim of identifying the potential development of cancer early on. Identifying early development benefits the public healthcare system and patients as it is more cost effective to intervene at an early stage and leads to better patient outcomes. Further details on these campaigns can be found in table 2 below.

Table 2. HSE Health Promotion Campaigns relevant to Cancer Prevention and Screening

Campaign name	Description
Askaboutalcohol.ie	Provides information and links to support on how to reduce/stop alcohol consumption. Highlights the links between alcohol consumption and a number of cancers.
BowelScreen	Promotes free bowel screening service to eligible members of the population.
BreastCheck	Promotes free breast screening service to eligible members of the population.
CervicalCheck	Promotes free cervical screening service to eligible members of the population.
QUIT	Provides information and links to support on how to quit smoking. Highlights the relationship between tobacco smoking and cancer.
SunSmart	Seeks to raise aware of the important on protecting skin from sun damage and provides information on how this can be achieved.
START (in partnership with safefood Ireland)	Aims to support families to take small steps to eating healthier food and becoming more active.

Sources: Health Service Executive, [Programmes and Campaigns](#); Health Service Executive, [Skin Cancer Prevention: SunSmart](#); safefood, [About START](#) (accessed 6 August 2023).

2.2.3 Screening

The HSE National Screening Service (NSS) operates four national population screening programmes, including three designated for cancer screening. These population-based screening programmes are free at the point of use and are aimed at people who do not have symptoms of cancer, but who fall into at-risk categories. These screenings test for biological changes or signs which indicate a person may develop cancer. Individuals are invited to participate in these screening programmes based on certain demographic traits (see table 3 below), which result in them being regarded as at higher risk of developing particular types of cancer. The purpose of these programmes is to facilitate the identification and treatment of cancer at the earliest possible stage, which is also the most efficient point, from both a public health and public finances perspective. Screenings as part of these programmes typically take place in primary care or community settings (BreastCheck and CervicalCheck) or at home (BowelScreen).

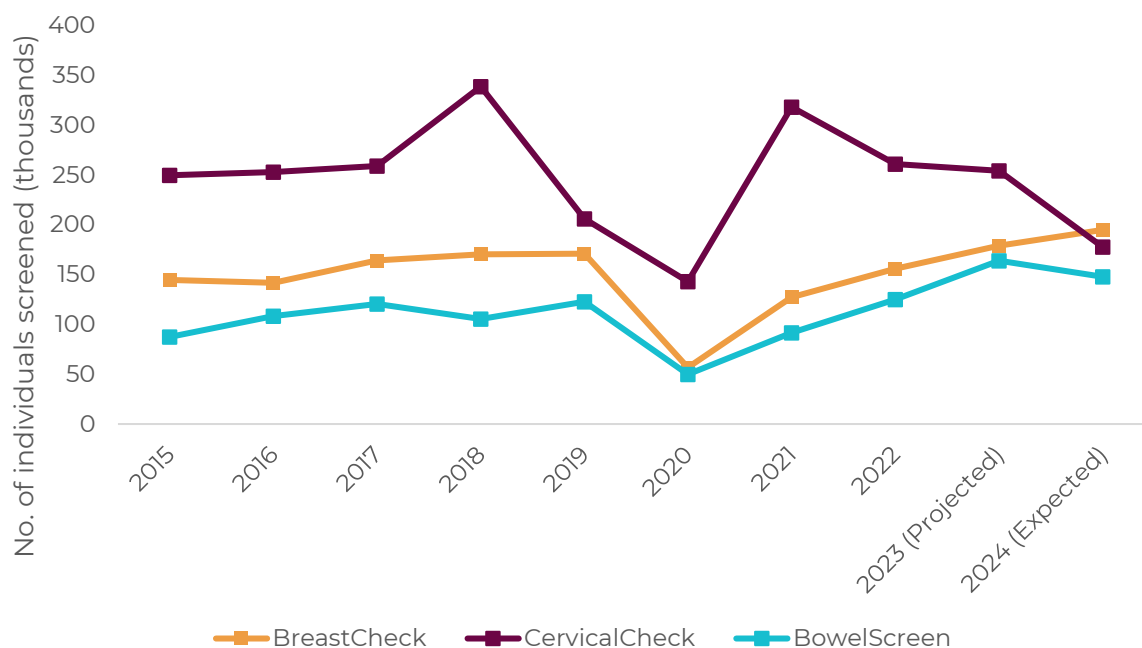
Table 3. Population-based Screening Programmes

Programme	Eligible Population	Frequency
BreastCheck	Women aged 50-69 years	Every two years
CervicalCheck	Women and people with a cervix aged 25-65 years	Age 25-29: Every three years
		Age 30-65: Every five years
BowelScreen	Men and women aged 60-69 years	Every two years

Source: PBO based on HSE National Screening Service (2023) [National Screening Service Strategic Plan 2023-2027](#).

Figure 3 outlines the number of people screened per programme from 2015 to 2022, projected outturn for 2023 and the expected activity for 2024. Historically, CervicalCheck screened a greater number of individuals than both BreastCheck and BowelScreen, although this reflects the larger eligible population and screening. Due to changes in screening intervals and forecasting, activity for 2024 is expected to be in line with BreastCheck and BowelScreen. The number of people screened by CervicalCheck declined following public controversies which first emerged in 2018 and fell further because of COVID-19 and subsequent public health measures. Numbers screened by BreastCheck and BowelScreen also fell because of the pandemic. These have been recovering since 2021. In total, 521,000 screenings are expected to take place in 2024 under these three programmes.

Figure 3. Number of Individuals Screened, National Screening Service programmes, 2015-2024



Sources: PBO based on Health Service Executive, *Monthly Performance Reports* (2015-2022) and *National Service Plan 2024* (2023-2024).

Note: 2023 figures represented 'Projected Outturn' while 2024 figures represented 'Expected Activity' as listed in the HSE National Service Plan 2024.

Note: Expected CervicalCheck activity is lower than 2023 activity for a number of reasons including changes related to screening intervals and improved forecasting.

Investment in population-level screening services for Breast, Cervical and Bowel cancers, combined with other factors such as new treatments and better awareness of symptoms has been effective in reducing associated mortality.¹⁸ As noted by the National Cancer Registry Ireland (NCRI), these screening programmes increase the chances of detecting the relevant cancers at an earlier stage, thereby reducing the complexity of treatment, and increasing long-term survival prospects.¹⁹ In addition to these screening programmes, individual-level screenings may also occur for other cancer types based on a person experiencing particular symptoms, where clinically appropriate.

2.3 Diagnosis and Treatment

This section provides a high-level overview of how the health service provides diagnostic services (section 2.3.1), treatment (2.3.2), psychological support (2.3.3), and palliative care (2.3.4).

¹⁸ National Cancer Registry Ireland (2022) *Cancer Trends No. 38 – Breast, cervical and colorectal cancer 1994 – 2019*.

¹⁹ National Cancer Registry Ireland (2023) *Cancer in Ireland 1994 – 2021: Annual statistical report of the National Cancer Registry*.

2.3.1 Diagnosis

Early diagnosis is essential to improving cancer survival rates.²⁰ The goal of early diagnosis is to identify cancer at the earliest stage possible, to facilitate more effective treatment and reduce fatality. This, in turn, is also a more cost-effective approach for the public health system. Population-based screening programmes are integral for supporting early-diagnosis of breast, colorectal and cervical cancers. Cancers may also be diagnosed through consultations between patients and doctors in primary care (general practice) or hospital settings, as a result of either patient or doctor being concerned about symptoms and initiating follow-up investigation. Rapid access clinics exist in designated cancer centres (further details below) for referrals of suspected breast, lung and prostate cancer.

Common types of tests to screen for cancer include:

- Radiology, involving medical imaging techniques such as X-ray or MRI.
- Histopathology, involving biopsy, blood tests, or urine tests.
- Endoscopy, involving the use of small cameras to look into the body.

Molecular cancer diagnostic testing services are also in place, albeit in a very limited capacity due to their relative novelty.²¹ The NCCP partially funds such testing at two hospitals, with limited testing taking place at other hospitals.

2.3.2 Treatment

As noted in the National Cancer Strategy, there are three major types of treatment used to treat cancer.²² Treatment type depends on what medical professionals judge as the most appropriate, considering factors such as cancer type, stage and patient traits, and could involve a combination of types. These treatments and their provision within the public Irish healthcare system are described in table 4 below.

²⁰ Department of Health (2017) *National Cancer Strategy 2017 – 2026*.

²¹ Ibid.

²² Ibid.

Table 4. Provision of Cancer Treatment in Public Hospitals

Treatment type	Description	Provision
Surgical	Involves the use of surgery to manage or provide curative or palliative treatment.	Eight designated centres for cancer surgery for adults located in counties Cork, Dublin, Galway, Limerick and Waterford and one satellite centre for breast cancer surgery in Donegal. One designed centre for children and adolescents based at CHI Crumlin.
Radiation	E.g., radiotherapy, involves the targeted delivery of radiation for curative or palliative treatment.	Seven in total, inclusive of five public hospitals in Cork, Dublin and Galway, and two private facilities in Limerick and Waterford where it is delivered to public patients.
Medical	E.g., chemotherapy, involves the use of medicine to treat cancer. Can also involve treatment with drugs.	26 hospitals nationally, inclusive of the nine designated centres for cancer and 17 other public hospitals.

Source: Health Service Executive, [Regional Cancer Services](#) (accessed 6 August 2023).

2.3.3 Psycho-Oncology Supports

The HSE National Cancer Control Programme manages a Psycho-Oncology Programme to provide psychological and mental health care to people affected by cancer, including patients and their carers and families.²³ This is an additional intervention to support the mental health of patients and their families. The National Cancer Strategy 2017 – 2026 acknowledges that access to dedicated psycho-oncology services within cancer centres is not at the required scale, being available in just two of the designated centres for cancer care.²⁴ Work is underway to expand the availability of psycho-oncology supports as per the National Cancer Strategy 2017-2026. The importance of psycho-oncology supports further underlines the dynamic and complex nature of cancer care services and the diversity of professionals involved in their delivery.

²³ HSE [About the NCCCP Psycho-Oncology Programme](#) (accessed 1 December 2023).

²⁴ Department of Health (2017) [National Cancer Strategy 2017 – 2026](#).

2.3.4 Palliative Care

Palliative care services are organised and overseen by the National Clinical Programme for Palliative Care within the HSE. Palliative care is typically regarded as end-of-life care. However, over the last two decades its role in cancer treatment has broadened to provide relief at earlier stages of a diseases' trajectory.²⁵ Palliative care services are organised into specialist and generalist services which work in partnership together. Palliative care can be provided in a range of settings, namely:

- Primary care
- At home
- Hospital
- Hospice

The majority of specialist palliative care is provided through the voluntary sector, including hospices, which are in part publicly funded by the HSE through service-level agreements. While the public healthcare system plays a key funding role in these services, this highlights the public healthcare system's reliance on non-State agencies, such as those in the private and charity sectors, to deliver essential services. Approximately 80% of patients accessing specialist palliative care providers have a cancer diagnosis.²⁶

2.4 Survivorship

2.4.1 Survivorship Supports

Survival rates have been increasing in recent years, and as such, the number of cancer survivors is growing.²⁷ Care for survivors is focused on providing services, information or resources following curative treatment, or during preventative and maintenance therapy. The National Cancer Strategy notes greater focus is also required on long term surveillance to monitor health complications which may arise following treatment.²⁸ The National Cancer Strategy recognises that these surveillance efforts will require a greater level of resourcing as the number of survivors continues to grow.²⁹ As of the end of 2021, 4.3% of the population are living after an invasive cancer diagnosis.³⁰

²⁵ Ibid.

²⁶ Ibid.

²⁷ Ibid.

²⁸ Ibid.

²⁹ Ibid.

³⁰ National Cancer Registry Ireland (2023) [Cancer in Ireland 1994 – 2021: Annual statistical report of the National Cancer Registry](#).

3. Cancer Care Spending in Ireland

3.1 Overview

No official aggregate data on health spending on cancer is available in Ireland.³¹ Furthermore, only limited disaggregated data is available. Due to the limitations within the HSE's financial system, it is not possible to clearly identify the level of Exchequer spending on the delivery, maintenance and improvement of cancer services. As a result, **it is not possible to determine the total level of investment in, or spending on, cancer services as a whole or the various elements outlined in the previous section, which presents challenges in examining the overall national level of spending on cancer care.** Additional investment in cancer care services will be required to at least maintain the existing level of service (ELS), as is the case with most areas of public spending. Even greater levels of investment may likely be required to expand services and improve outcomes and the quality of life of those affected by cancer. A range of factors including demographic change, the high cost of new medicines, price inflation on medical goods, potential policy changes and public sector pay increases will all drive spending on cancer care in Ireland. This highlights the importance of understanding, in detail, how public monies are spent to inform decision-making, maximise outcomes, and enhance budgetary oversight.

3.2 Current Spending Estimate

As noted previously, the best estimate suggests direct costs to the Irish health system (inclusive of public and private providers) in 2018 totalled €1.14 billion.³² However, this estimate is based on the assumption that 5% of current health spending in Ireland was spent on cancer care, reflecting an estimate based on UK data. Furthermore, these 'direct costs' include spending from non-government sources such as private providers and out-of-pocket payments. Despite these assumptions, this estimate is in line with previous OECD findings from 2013, albeit based on older data, which indicates on average, cancer care accounts for 5% of all healthcare costs.³³ However, at the time the OECD noted that spending on cancer care is growing faster than overall health spending due to increasing incidence, improved survival rates, and the high costs of new treatments and technologies.³⁴

³¹ Hofmarcher, T., Ericson, O. & Lindgren, P. (2022) *Comparator Report on Cancer in Ireland – Disease Burden, Costs and Access to Medicines*.

³² Hofmarcher, T. et al. (2019) *Comparator Report on Cancer in Europe 2019 – Disease Burden, Costs and Access to Medicines*.

³³ OECD 2013 *Focus on Health – Cancer Care*.

³⁴ Ibid.

Provisional data for 2022 indicates that current health spending in Ireland equated to €30.5 billion, inclusive of public and private spending.³⁵ Assuming 5% of current health spending goes toward cancer care, approximately €1.52 billion spent was on cancer care in 2022. However, caution must be exercised when interpreting these figures for a number of reasons. For instance, the headline current health spending figure - €30.5 billion - is provisional and subject to change. Furthermore, the figure for cancer care spending - €1.52 billion - is also derived from the total current health spending, which comprises both public and private spending. In addition, data underpinning the 5% assumption is over a decade old and based on a different model of healthcare system. Finally, the 5% assumption may be an under-estimate of total cancer spend given the OECD observation regarding the trend of cancer spending is outpacing general health spending.

Regarding the levels of public and private investment, the annual System of Health Accounts shows public current spending is consistently higher than private levels. Preliminary data from the CSO indicates:³⁶

- 77% of current healthcare spending was financed by public sources, compared to
- 12% from private voluntary health insurance, and
- 11% by out-of-pocket payments.

Assuming this split applies to the estimate of €1.52 billion total current spending on cancer care, public spending would equate to €1.17 billion. This equates to 5.2% of the total (gross) current spending of €22.4 billion by the Department of Health (Vote 38) in 2022.³⁷ It is important to note that in the absence of available data, this estimate is purely illustrative and cannot be verified for accuracy.

3.3 Current Spending Data

Current spending on publicly delivered cancer care is funded through the Department of Health (Vote 38) and managed by the HSE as it provides services, employs healthcare and administration staff, and purchases medicines and equipment; this is where further clarity on the overall spending level and spending on associated services can be reconciled. As section 2 previously highlighted, services are provided by a range of several different HSE units and programmes. These are listed in table 5 below, alongside their respective 2024 NSP budget allocations. The 2024 budgets of all units/programmes listed are not exclusively used in the provision of cancer care; however, at this time it has not been possible to discern what

³⁵ CSO (2023) [System of Health Accounts 2021](#).

³⁶ Ibid.

³⁷ PBO calculation based on [DPER Databank](#) (accessed 29 January 2024).

proportions of each budget are used to provide cancer services. The overall budget for the National Cancer Control Programme was explicitly set out in previous HSE National Service Plans, providing some, albeit limited, insight into a budget for cancer services. However, this information is not provided in the HSE NSP 2024.

Table 5. Programmes referenced in HSE NSP 2024 which may include Spending on Cancer Services and 2024 NSP Budget

HSE Unit/Programme	Budget (€m)
Acute Hospital Care	7,794.2
Palliative Care	155.5
Health and Wellbeing – Community	10.8
Other Operations Service Areas	1,722.5
Primary Care Reimbursement Service	3,713.8
Overseas treatment	51.5
Total	13,448.3

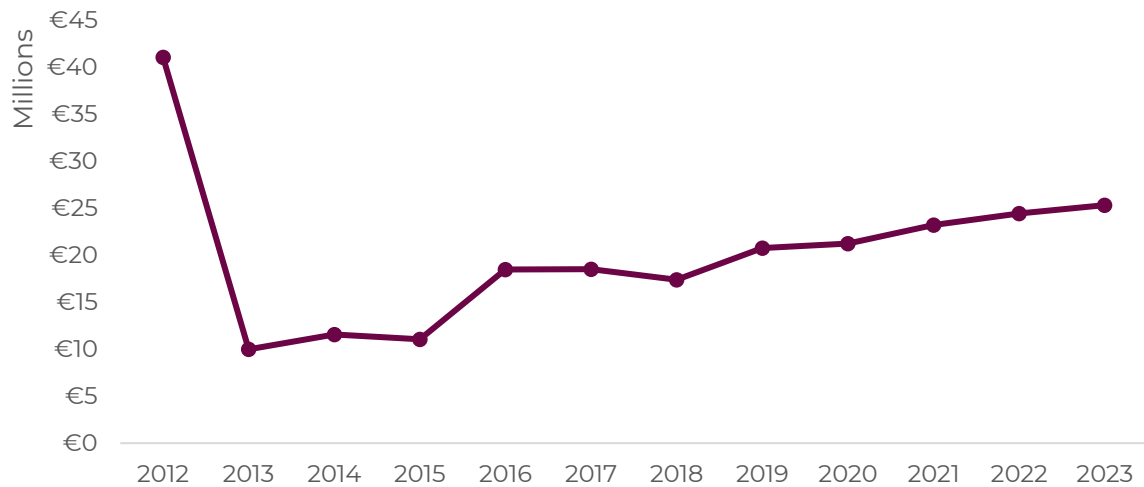
Source: Health Service Executive (2024) [National Service Plan 2024](#).

Spending on pharmaceuticals is as a major driver of healthcare spending generally.³⁸ In particular, cancer is a treatment area where there has been considerable growth in spending on pharmaceuticals in recent years and where further significant growth can be expected.³⁹ Since 2012, Governments have allocated a specific portion of the health budget for oncology drugs (see Figure 4). In 2012 the allocation was €41 million but fell to €10 million in 2013. However, since 2013, the allocation has increased substantially to an estimated €25.34 million in 2023. **This indicates that funding for oncology drugs has increased by 153% between 2013 and 2023.**

³⁸ Connors, J. (2017) [Future Sustainability of Pharmaceutical Expenditure](#).

³⁹ Ibid.

Figure 4. Annual Allocations for Oncology Drugs, Revised Estimates for Public Services, 2012-2023



Source: Department of Public Expenditure, NDP Delivery and Reform, [Revised Estimates for Public Services 2012 - 2023](#).

Furthermore, additional data on spending on publicly reimbursed oncology drugs is available from the HSE Primary Care Reimbursement Service (PCRS), albeit limited. For example, PCRS reports on the top 100 reimbursed high-tech products by cost. From January to August 2023, a total of €667 million has been spent on the top 100 (by ingredient cost) high-tech medicines.⁴⁰ The high-tech drug arrangement provides for medicines associated with higher treatment costs, such as those for serious, complex or chronic conditions rather than more general medicines.⁴¹

Just over €173 million (26%) of this was spent on drugs which are used to treat cancer, covering 37 medicines.⁴² These high-tech medicines are typically self-administered by patients.⁴³ While treatment is initiated in an acute setting, it can be continued through community pharmacies, which in turn receive a patient care fee through the PCRS, as provided for the high-tech arrangement. PCRS annual reports include the amount spent via the Oncology Drugs Management System (ODMS). The ODMS was introduced by the HSE National Cancer Control Programme in 2012 to oversee and manage the funding of certain hospital-administered medicines to public hospitals. Figure 5 illustrates the amount spent annually (excluding 2017, data not available) via the ODMS. As highlighted by figure 5, **spending on hospital-administered cancer medicines under**

⁴⁰ PBO calculations based on HSE PCRS [Top 100 Products by Ingredient Cost \(HTS Scheme\)](#) (accessed 16 November 2023).

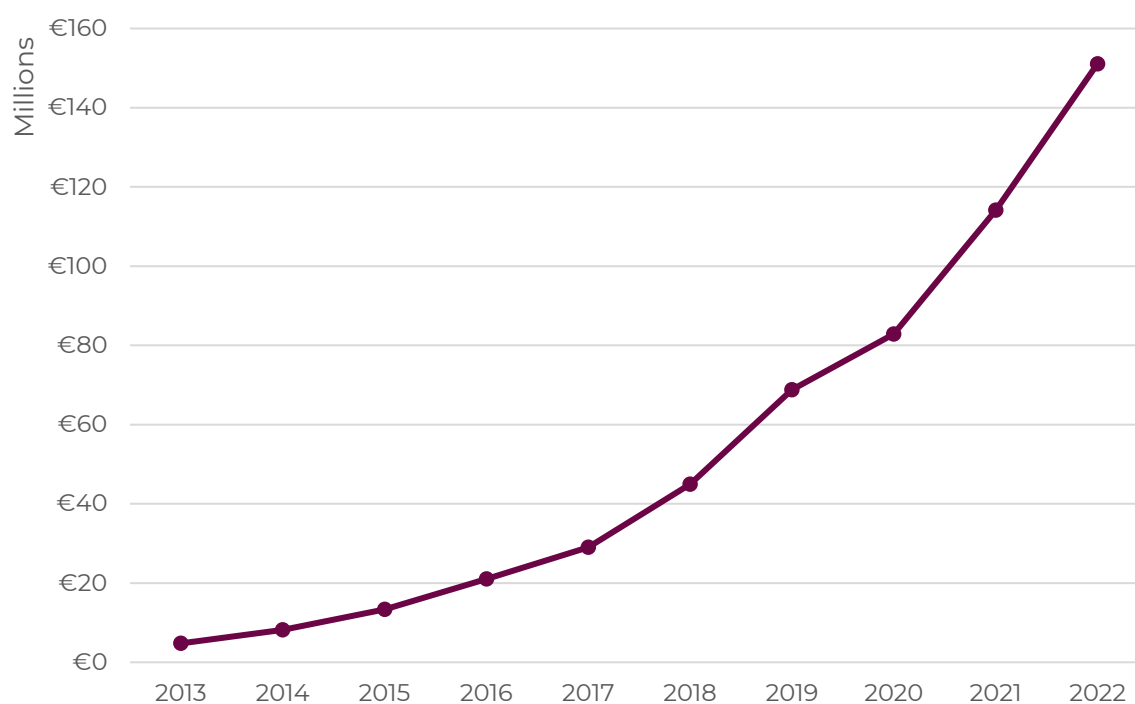
⁴¹ Prior, S. et al. (2021) [Spending Review 2021: Review of High-Tech Drug Expenditure](#).

⁴² PBO calculations based on HSE PCRS [Top 100 Products by Ingredient Cost \(HTS Scheme\)](#) (accessed 16 November 2023).

⁴³ HSE NCCP [Cancer Drug Management Programme](#) (accessed 16 November 2023).

the ODMS has increased from €4.7 million in 2013 to €151 million in 2022 – an increase of over 3000%. It is important to note that the data on spending presented here and in figure 4 above do not represent the totality of public spending on cancer treatment medicines and does not consider other medicines such as those used to manage pain or side effects from treatment which may also be provided to cancer patients at no charge. From figures 4 and 5, it is clear that pharmaceuticals are a major driver of spending. As noted by IGEES previously, given the agreements between the Department of Health, HSE and pharmaceutical manufacturers which prevents price increases, pharmaceutical spending is primarily driven by the higher cost of new medicines and volume growth.⁴⁴

Figure 5. Spending on Hospital-Administered Cancer Medicines in Public Hospitals via OMDs, 2013-2022



Source: HSE PCRS [Annual Reports 2013 - 2022](#).

Additional insights into new resources, including financial and personnel, are provided through annual National Cancer Strategy 2017 – 2026 implementation reports. For example, in 2022 172 staff were recruited to cancer services and €20m additional funding was provided for the development of services.⁴⁵ While these insights are welcome, the data represents only a fraction of the total resources involved in the delivery of cancer services. In this context, it cannot be understood against the full

⁴⁴ Prior, S. et al. (2021) [Spending Review 2021: Review of High-Tech Drug Expenditure](#).

⁴⁵ Department of Health (2023) [Minister for Health publishes the National Cancer Strategy 2017-2026 Implementation Report 2022](#) (accessed 22 November 2023).

scale of cancer-specific spending. This exemplifies the limitations of the current HSE financial management system, which is fragmented and was inherited from the health boards that were replaced by the HSE in 2005. **Furthermore, due to these data limitations it is currently not possible to comprehensively link investment with performance or outcomes. As a result, it is not possible to analyse investment within a performance-budgeting framework.**

The HSE is undertaking a financial reform programme which will see the implementation of a single integrated financial management system (IFMS) across the entire health service, including statutory and voluntary organisations. The need for the IFMS was initially identified in 2013 and was reinforced by the Oireachtas Committee on the Future of Healthcare.⁴⁶⁻⁴⁷ Implementation is underway and will consist of five stages, with the first stage having been implemented in July 2023. The HSE projects implementation will be completed by May 2025.⁴⁸ As noted by the PBO and IGEES, the IFMS underpins more effective analysis of healthcare spending and should make possible clearer reporting of spending across HSE health regions and by programmes.^{49,50}

As a result of the current financial systems in place, it is not possible to discern what proportion of each budget is used in the provision of cancer care. Subsequently, it is not possible to identify spending from these budgets at service or aggregate level, as the current HSE financial system does not facilitate tracking spending by service or care pathway. **Although allocating resources according to service or care area may not be feasible, the ability to track spending by service level would provide a number of benefits.**^{51,52} **Such benefits include:**

- Ability to better compare spending and outcomes with EU/OECD countries to understand how Ireland performs internationally,
- Improved oversight of public health investment and transparency of spending,
- Capacity to better identify key drivers of healthcare spending, and
- An enhanced evidence base to inform healthcare policy and budgetary planning.

Although Ireland is not unique in an OECD context in that cost-of-illness (also known as disease accounts or disease-specific expenditure) data or

⁴⁶ PA Consulting Group (2013) [Defining Financial Management: A Finance Operating Model for Health in Ireland](#).

⁴⁷ Oireachtas Committee on the Future of Healthcare (2017) [Sláintecare Report](#).

⁴⁸ Health Service Executive [Implementation Timeline – IFMS Project](#).

⁴⁹ Parliamentary Budget Office (2018) [The HSE National Service Plan and its Relationship with the Health Vote](#).

⁵⁰ O'Malley, C. et al. (2023) [Towards Population-Based Funding for Health: Model Proposal](#).

⁵¹ Australian Institute of Health and Welfare (2022) [Disease expenditure in Australia 2019-2020](#).

⁵² Wieser S. et al. (2018) [How much does the treatment of each major disease cost? A decomposition of Swiss National Health Accounts](#).

estimates are not available, some member states publish data at regular or *ad-hoc* intervals.⁵³ For example, Germany and the Netherlands publish disease-specific expenditure data at 5- and 2-year intervals, respectively. Australia produces estimates every 1-2 years since 2019, each covering a 2-year period, and Canada produces estimates at varying intervals.

While cost-of-illness estimates would be beneficial, they are associated with several limitations. Principally, cost-of-illness studies capture only resource costs faced by healthcare providers, patients and carers, and omit non-resource costs such as impact on health or loss of life.⁵⁴ Some non-resource costs can be partially captured by metrics such as Quality-Adjusted Life Years (QALYs) or Disability-Adjusted Life Years (DALYs). More limited studies or estimates include costs to healthcare providers only, and do not consider the broader economic costs associated with lost productivity due to the incidence of an illness or death. Therefore, it is important to highlight that while cost-of-illness studies are beneficial to budgetary oversight and planning, and to health policy planning, they provide insights into just one aspect of the overall economic and non-economic costs of illness.

The HSE Healthcare Pricing Office (HPO) develops an annual pricing list for hospital services activity within public hospitals. The scope of the pricing list is limited to admitted care (inpatient and day cases) but is due to be expanded to Emergency Departments and Outpatient Departments, and later to Community settings, in line with the Sláintecare Implementation Strategy.⁵⁵ This data is captured through the Healthcare In-Patient Enquiry (HIPE) scheme and may provide a basis for future comprehensive estimates of the cost of treating patients for cancer and other conditions.

3.4 Capital Spending on Cancer Care

Capital spending in the public healthcare system is important to ensure the expansion of services, building or refurbishment of dedicated facilities, and the purchase of modern equipment, which are used to increase capacity in the health system. Capital allocations for 2023 are outlined in table 6. As with the HSE National Service Plan, it is not possible to discern what share of the HSE Capital allocation will be spent on cancer services, with the exception of radiation oncology. The remaining capital programmes are expected to enhance the capacity of the healthcare system in providing cancer care services. Understanding the potential level of capital investment is important to understanding the overall capital investment used to support the expansion and delivery of cancer services.

⁵³ OECD (2013) *Expenditure by Disease, Age & Gender*.

⁵⁴ The Public Health Agency of Canada (2018) *Economic Burden of Illness in Canada 2010*.

⁵⁵ HSE Healthcare Pricing Office (2022) *ABF Pricing Framework for the 2023 Price List*.

Table 6. Categories in the HSE Capital Plan 2023 which may include Spending on Cancer Services

Programme	Budget (€m)
Acute – Capacity	94.61
Acute – Diagnostics / Laboratories	42.15
Equipment Replacement Programme	65
Radiation Oncology	9.89
Total	211.65

Source: Health Service Executive (2023) [Capital Plan 2023](#).

4. Epidemiology of Cancer in Ireland

4.1 About Epidemiological Data

Due to the current limitations on the availability of, and access to, cancer related spending data in Ireland, it is difficult to assess the effectiveness of the public health spending in this area. However, cancer-related epidemiological data is publicly available and accessible, and allows for an examination of cancer trends, namely: incidence, mortality and survival.

Understanding these trends provides an insight into how cancer has changed in Ireland over time. These trends are influenced by a range of factors such as demographic trends (e.g., people living longer), lifestyle behaviours among the population (e.g., smoking levels), changes to health services (e.g., structural, operational), and investment in public health services. This section presents epidemiological data on cancer in Ireland, as examining this will allow for an improved assessment of cancer until cancer related spending data is available. The epidemiological data presented is concerned with past trends and the current situation; and highlight the importance of understanding the level of public investment required due to the scale of cancer incidence and associated mortality. Data on projections and future trends are not included, though projections published by the NCRI further underlines the importance of addressing the limited available spending data in order to better estimated future investment needs.⁵⁶

It is important to note that terms used in this section such as “cancer” and “invasive cancer” are broad and apply to a large number of diseases. Therefore, data presented in section 4 are reflective of the general trend of cancer in Ireland and may or may not reflect trends observed among specific invasive cancers such as lung cancer, for example.

Box 1. Epidemiological Data

Where possible, incidence and mortality statistics discussed below are presented as age-standardised rates (ASR). Where relevant, ASR will be clearly referenced.

Age-standardised rates are a common means of presenting the distribution of new cases (incidence) and deaths (mortality) over a population because they control for differences in the age profile of populations of different countries, or of the same country across different time periods.

ASR for cancer incidence and mortality are calculated by the National Cancer Registry using the European Age- Standardised Population

⁵⁶ National Cancer Registry Ireland (2019) [Cancer Incidence Projections for Ireland 2020-2045](#).

(EASP). This facilitates the comparability of statistics across EU states. ASRs presented below are based on the 2013 (newer) EASP weightings, as opposed to the 1976 (older) EASP weightings.

4.2 Incidence

In Ireland, the incidence of cancer has been increasing over recent years. This has been attributed to a number of causes, including:⁵⁷

- Demographic change, including population growth and population ageing,
- Increases in risk factors (e.g., obesity, alcohol consumption, ultraviolet radiation exposure), and
- The impact of screening.

Other risk factors include smoking, diet and nutrition, low levels of physical activity, inherited predisposition, and social deprivation, among others can contribute to incidence rates.^{58,59} It is estimated that an average of 43,470 cancers were diagnosed in Ireland during 2018-2020.⁶⁰ Of these, approximately 35,800 were invasive cancers and 7,600 were non-invasive tumours. Table 7 outlines the most common invasive cancers in Ireland for both males and females, excluding non-melanoma skin cancer (NSMC) for the years 2018 to 2020.⁶¹ Due to the impact of COVID-19 on diagnosis and subsequent incidence statistics, 2019 is used as the key reference year for which full final data is available to support comparisons with previous decades. Data for the years 2020 – 2022 are referenced throughout to indicate the current position. The following paragraphs outline trends in cancer incidence over the period 1999 – 2020.

⁵⁷ Department of Health (2017) [National Cancer Strategy 2017 – 2026](#).

⁵⁸ Ibid.

⁵⁹ National Cancer Registry Ireland (2023) [Cancer Inequalities in Ireland by Deprivation 2004-2018](#).

⁶⁰ National Cancer Registry Ireland (2022) [Cancer in Ireland 1994 – 2020: Annual statistical report of the National Cancer Registry](#).

⁶¹ Invasive cancers are often presented in two categories: NMSC, which are rarely fatal, and all other invasive cancers.

Table 7. Five Most Common Cancers in Males and Females in Ireland 2018-2020

Rank	Males	Females
1	Prostate	Breast
2	Colorectal	Lung
3	Lung	Colorectal
4	Melanoma of the skin	Melanoma of the skin
5	Non-Hodgkin lymphoma	Uterus

Source: National Cancer Registry Ireland (2022) [Cancer in Ireland 1994 – 2020: Annual statistical report of the National Cancer Registry](#).

The following paragraphs details how the incidence of invasive cancer has developed over the period 1999 to 2019, highlighting the prevalence of cancer in Irish society, at a population level, and among males and females. Data on diagnoses are collected by the National Cancer Registry Ireland (NCRI), who then publish incidence statistics. Incidence statistics for 2020 are also referred to, to illustrate the impact of the COVID-19 pandemic.

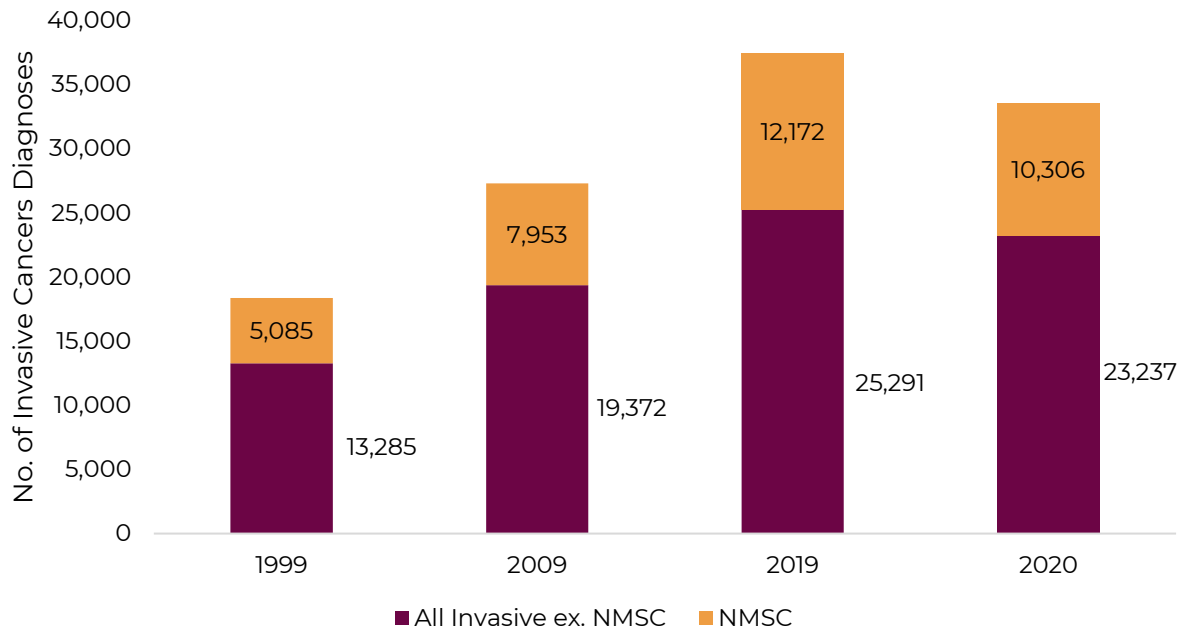
In 2019, 37,463 invasive cancers were diagnosed, compared to 18,370 diagnosed in 1999 (see figure 6 below). This represents an increase of 104%. The number of reported cancer diagnoses fell in 2020 following the onset of the COVID-19 pandemic. The pandemic caused significant disruption and limited the health service's ability to diagnose and control cancer among the population.⁶² In 2020, a total of 33,534 cancers were diagnosed. The NCRI notes the number of cancers registered in 2020 is 10% lower than earlier projections had indicated; and 4% in 2021.^{63,64}

⁶² National Cancer Registry Ireland (2023) [Cancer in Ireland 1994 – 2021: Annual statistical report of the National Cancer Registry](#).

⁶³ Ibid.

⁶⁴ Ibid.

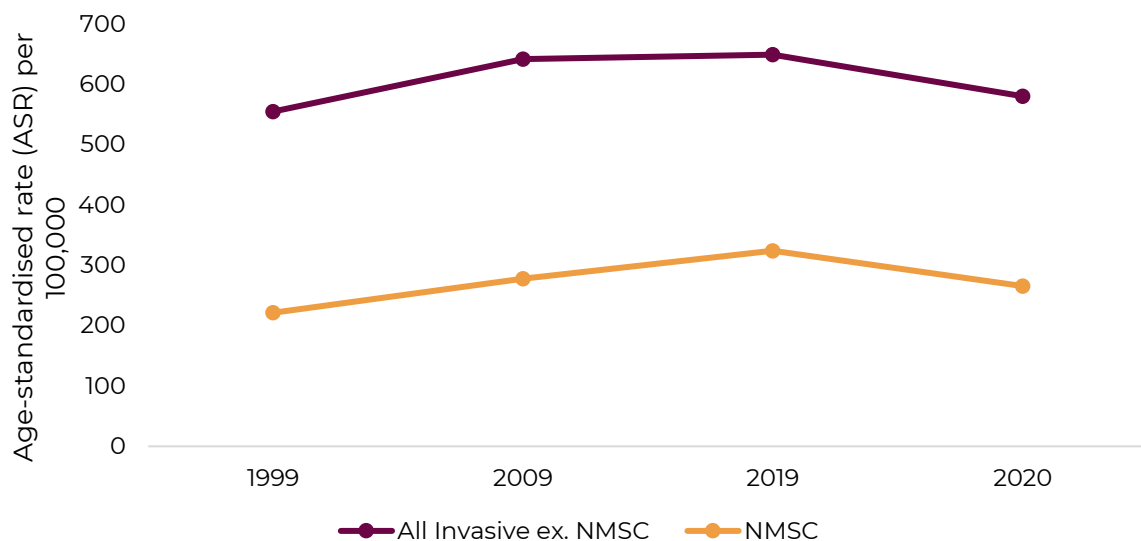
Figure 6. Number of Invasive Cancers Diagnosed, total population, selected years 1999-2020



Source: PBO based on National Cancer Registry Ireland, [Incidence Statistics](#) (accessed 1 August 2023).

Figure 7 shows that the incidence rate (ASR) of invasive cancer (excluding non-melanoma skin cancer (NMSC)) increased by 17% from 1999 (555.1 per 100,000) to 2019 (649.4 per 100,000). The rate of NMSC increased by 46% from 1999 (221.5 per 100,000) to 2019 (324.3 per 100,000). The incidence rate of all invasive cancers declined in 2020, reflecting the fewer number of cases diagnosed due to the disruption caused by the COVID-19 pandemic.

Figure 7. Incidence Rate of Invasive Cancers Diagnosed, total population, selected years 1999-2020



Source: PBO based on data provided by National Cancer Registry Ireland.

Overall, invasive cancer tends to be diagnosed more among males than females in Ireland, as figure 8 highlights. Among males, the total number of cancers diagnosed has increased from 9,640 in 1999 to 20,484 in 2019, an increase of 112%. The number of cancers diagnosed among the female population increased from 8,730 in 1999 to 16,679 in 2019. This represents an increase of 91%. In 2020, 18,537 invasive cancers (incl. NMSC) were diagnosed among males and 15,006 among females.

The excess burden of cancer experienced by the male population in comparison to the female population, may be explained, at least in part, by a higher exposure to risk. For example, the Healthy Ireland Survey 2023 found men are more likely than women to smoke tobacco and consume alcohol, including to engage in binge drinking, and are less likely to utilise healthcare services.⁶⁵ Meanwhile, the Healthy Ireland Survey 2022 found men are more likely to be overweight or obese, while simultaneously being less likely to take measures to protect their skin from sun damage; the 2021 Healthy Ireland Survey also found evidence of poorer dietary behaviours among men.^{66,67}

Figure 8. Number of Invasive Cancers Diagnosed by Sex, selected years 1999-2020



Source: PBO based on National Cancer Registry Ireland, [Incidence Statistics](#) (accessed 1 August 2023).

Figure 9 sets out the incidence rates (ASR) of all invasive cancers (excluding NMSC), and NMSC, among males and females. Among males, the incidence rate of all invasive cancers (excluding NMSC) has increased by 9% from 1999 to 2019, as it changed from 679.2 per 100,000 to 744.6.

⁶⁵ Department of Health (2023) [Healthy Ireland Survey 2023: Summary Report](#).

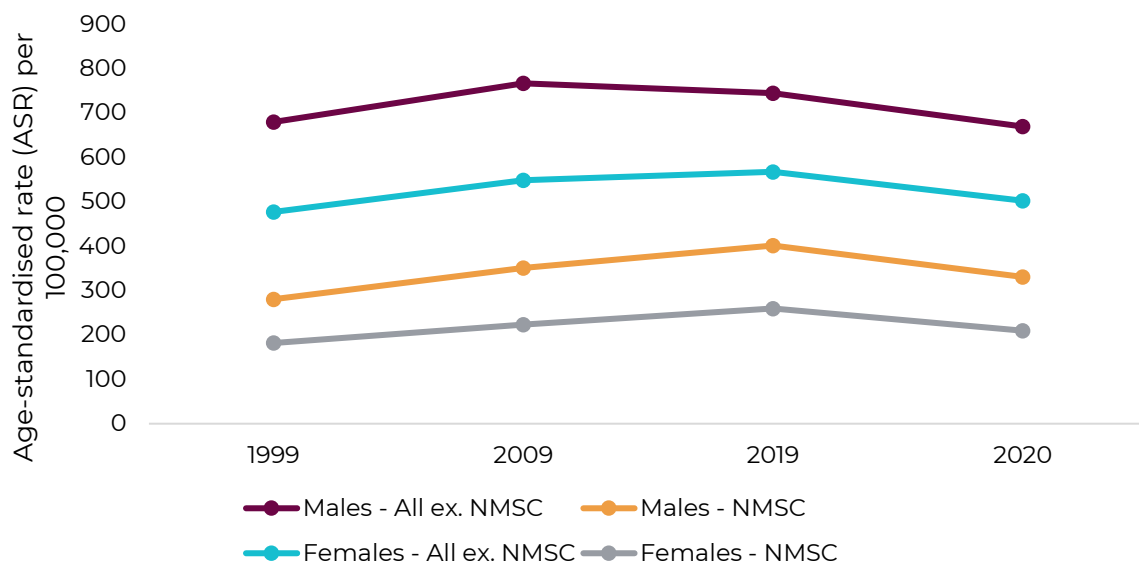
⁶⁶ Department of Health (2022) [Healthy Ireland Survey 2022: Summary Report](#).

⁶⁷ Department of Health (2021) [Healthy Ireland Survey 2021: Summary Report](#).

Meanwhile, over the same period, the incidence rate of NMSC has increased by 43% among males, as it rose from 280.4 in 1999 to 401.2 in 2019. It is important to note that the incidence rate among males appears to have peaked at 787.6 in 2011 and have broadly been in decline since.

Similar patterns are observed among females, with the incidence rate of invasive cancer (excluding NMSC) increasing by 19%, and the incidence rate of NMSC increasing by 43% over the same period. These increases reflect a change in the rate of invasive cancer (excluding NMSC) from 476.9 in 1999 to 567.3 in 2019, and an increase from 181.7 to 259.5 with regard to NMSC over the same period among females. While rates among women have not decreased over the last decade as they have among men, they are increasing at a much slower pace. Compared to 2019, all incidence rates decreased in 2020, reflecting the disruption of the COVID-19 pandemic.

Figure 9. Incidence Rate of Invasive Cancers Diagnosed by Sex, selected years 1999-2020



Source: PBO based on data provided by National Cancer Registry Ireland.

4.3 Mortality

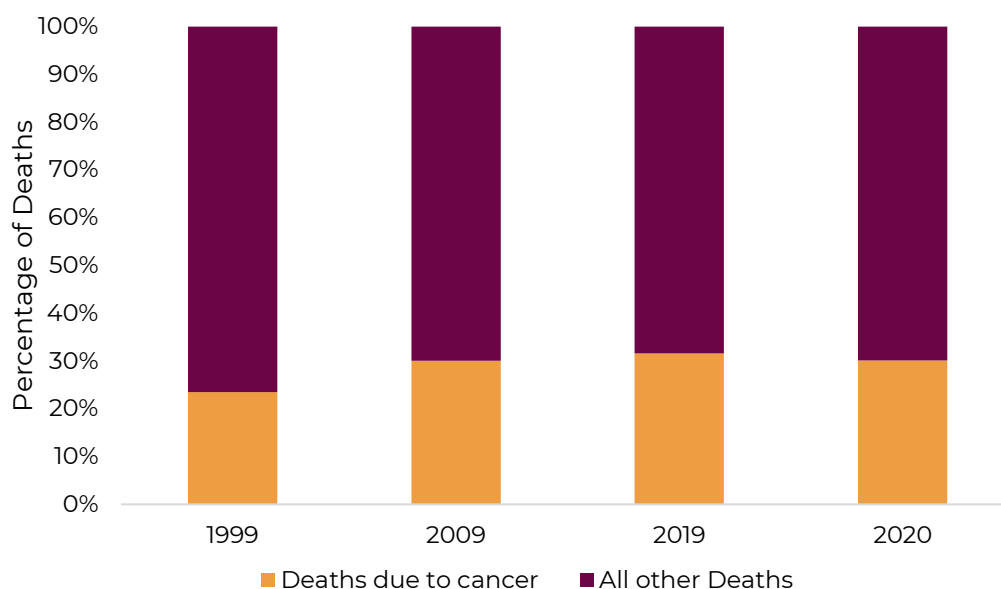
Cancer is the leading cause of death in Ireland.⁶⁸ Preliminary data for 2022 indicates 10,541 deaths were caused by cancer, out of total 35,477; accounting for 30% of deaths.⁶⁹ This includes both malignant (invasive) and benign (in-situ) cancers, though the vast majority are due to malignant cancers. The proportion of deaths caused by cancer is slightly lower in 2020 (30%) than in 2019 (32%), the most recent year for which full final data

⁶⁸ Central Statistics Office (2023) *Vital Statistics Yearly Summary 2022*.

⁶⁹ Ibid.

is available (see Figure 10). However, it is important to note 2020 mortality figures are impacted by deaths due to COVID-19, which may explain why the proportion decreased in that year. The overall proportion of deaths caused by cancer is up from 23% in 1999. While the second largest principal cause of death is circulatory (cardiovascular) disease, at 27% in 2022.

Figure 10. Deaths Caused by Cancer as a % of Total Deaths, Selected Years 1999-2020



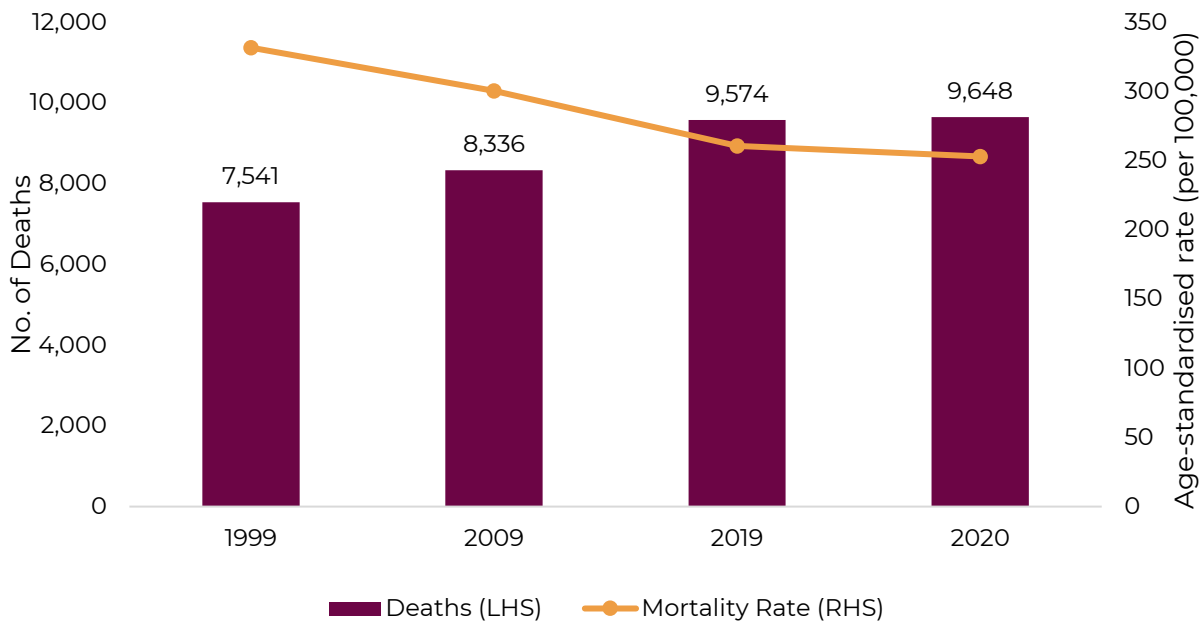
Sources: PBO based on Central Statistics Office, [Vital Statistics Annual Report 1999](#) (1999), Table [VSA08 Deaths Occurring](#) (2009), Table [VSA29 Deaths Occurring](#) (2019 & 2020) (accessed 2 August 2023).

Figure 11 sets out the total number of deaths a result of cancer, as well as the proportion of deaths attributable to cancer from 1999 to 2020. In 1999, there were 7,541 deaths attributed to invasive cancer, which increased to 9,574 in 2019, representing a change of 27%. The number of deaths in 2020 is up slightly when compared to 2019 at 9,648.

While the total number of deaths attributed to cancer increased, the overall mortality rate (ASR) has decreased over this period. The mortality rate declined from 331.6 per 100,000 of the population in 1999 to 260 by 2019; and again to 253 by 2020. The falling mortality rate, despite the increased incidence seen in the previous section highlights the progress made in Ireland in the early detection and treatment of cancer. This enables a more cost-effective approach and improves the chances of survival and enhances quality of life for patients. This is also supported by the finding that the number of cancers diagnosed from 1999-2019 increased by 104%, while the number of deaths increased by a much lesser magnitude of 27%.

Provisional CSO data for 2022 indicates that there were 10,280 deaths caused by malignant cancers, of a total 35,477 deaths.⁷⁰

Figure 11. Deaths due to Invasive Cancer, Selected Years 1999-2020



Sources: PBO based on Central Statistics Office, *Vital Statistics Annual Report 1999* (1999), Table *VSA08 Deaths Occurring* (2009), Table *VSA29 Deaths Occurring* (2019 & 2020) (accessed 2 August 2023) and Cancer Mortality (ASR) data provided by the National Cancer Registry Ireland.

Note: Mortality Rate excludes deaths caused by NMSC.

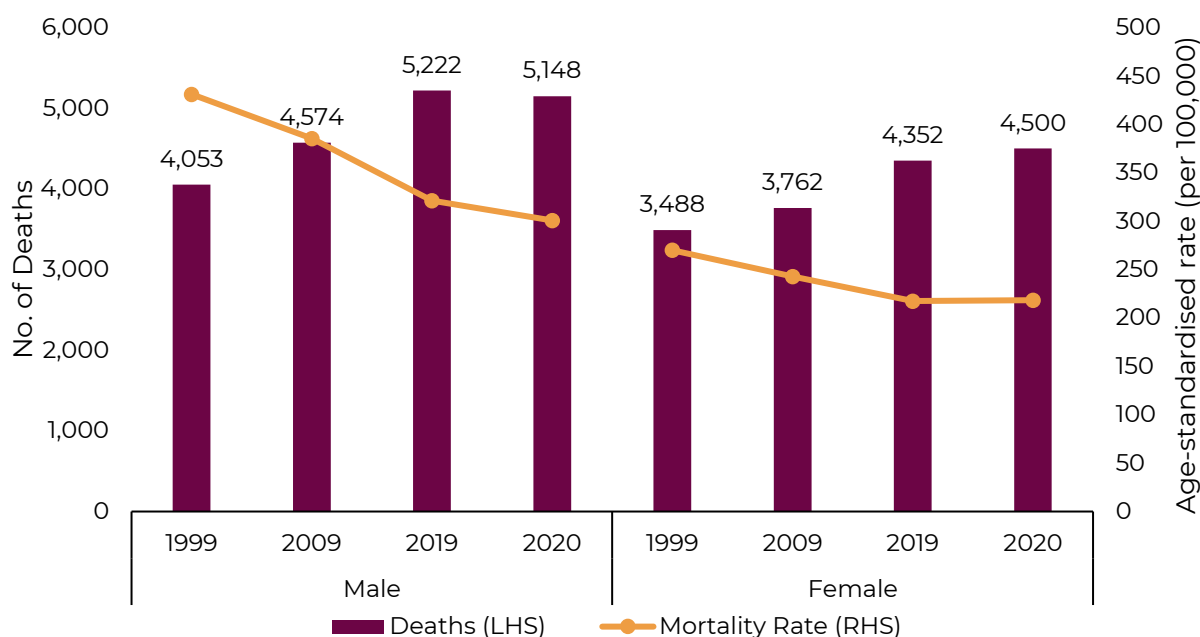
Note: LHS - left hand side axis; RHS – right hand side axis.

The number of deaths due to invasive cancer among males and females, set out in figure 12, reflect those seen among the total population. In 2020, 5,148 deaths among males were attributed to invasive cancer, up from 4,053 in 1999. Among females, the number of deaths increased from 3,488 in 1999 to 4,500 in 2020.

Despite these increases, the mortality rate of invasive cancers (excluding NMSC) is decreasing. As noted previously, it is important to highlight that this reflects the overall trend among all cancers and may not reflect trends among specific cancers which may have increased over the period. For example, though overall mortality rates have declined, the mortality rates of liver cancer among men and melanoma of the skin among women have increased over the same period. The mortality rate among males has fallen from 431.1 per 100,000 to 300.8 over the period 1999-2020; while the rate has fallen from 269.9 per 100,000 to 218.4 among females.

⁷⁰ Ibid.

Figure 12. Deaths due to Invasive Cancer by Sex, Selected Years 1999-2020

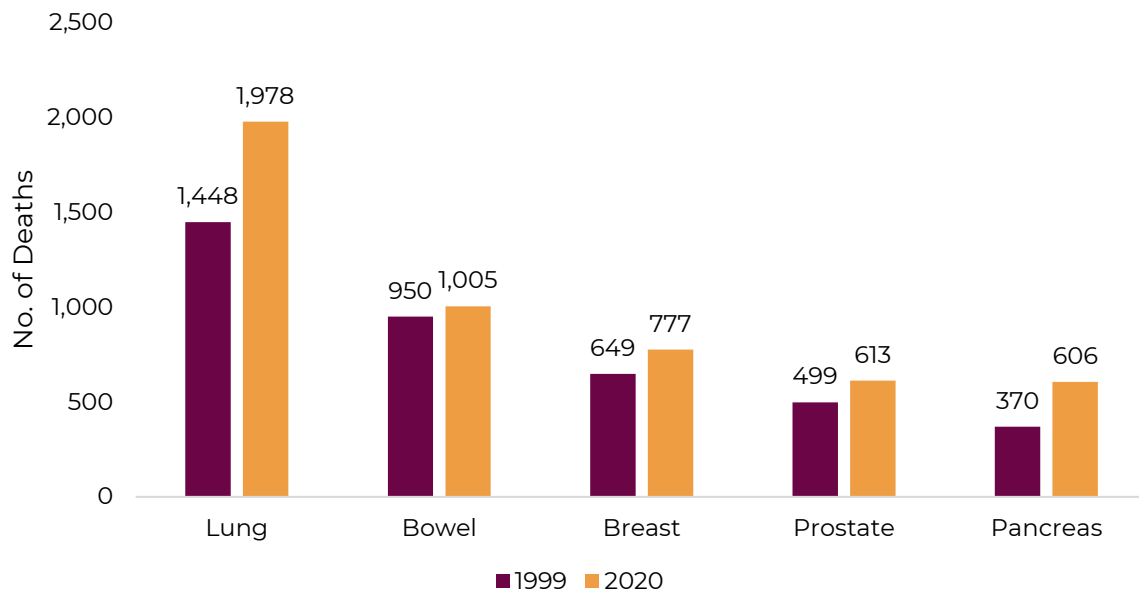


Sources: PBO based on Central Statistics Office, [Vital Statistics Annual Report 1999](#) (1999), Table [VSA08 Deaths Occurring](#) (2009), Table [VSA29 Deaths Occurring](#) (2019 & 2020) (accessed 2 August 2023) and Cancer Mortality (ASR) data provided by the National Cancer Registry Ireland.

Note: Mortality Rate excludes deaths caused by NMSC.

Note: LHS - left hand side axis; RHS – right hand side axis.

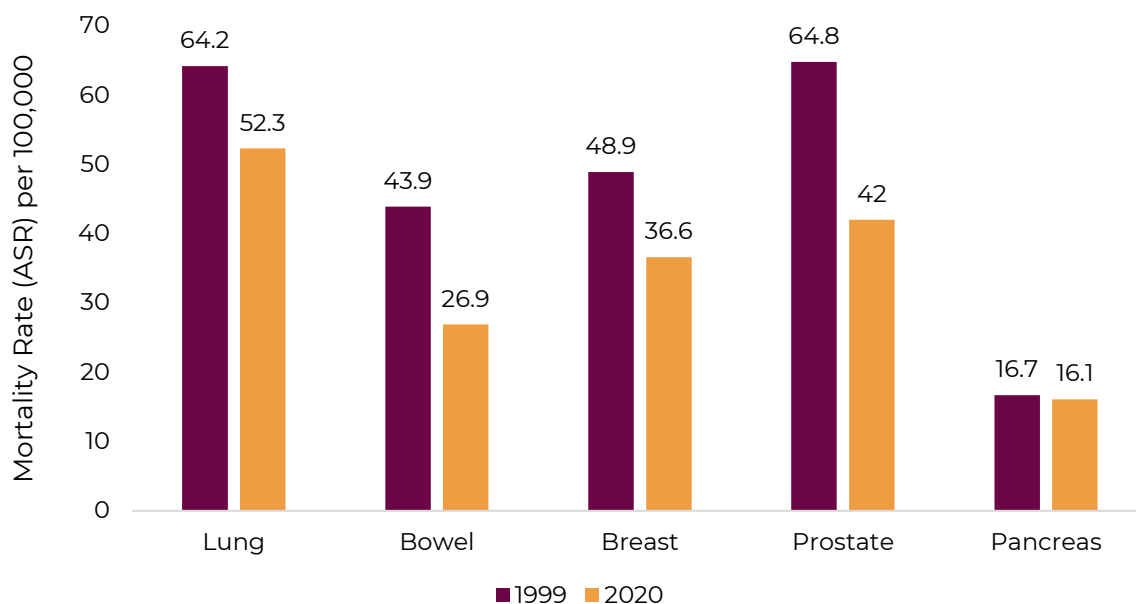
Given that cancer is the main cause of death in Ireland, it is important to understand the impact of the individual types of cancers as some can be more or less fatal or can have different impacts on people. Figure 13 below provides a breakdown of the most common cancers in Ireland causing death in 1999 and 2020. The most common cancers causing death in 1999 remain the most common in 2020, the most recent year for which data is available. In 2020, lung cancer was the common cause of death, accounting for almost 2,000 deaths. This was followed by bowel cancer (1,027 deaths), breast cancer (777), prostate cancer (613), and pancreatic cancer (606). The number of deaths caused by each cancer has increased the period.

Figure 13. Most Common Cancers Causing Death, 1999 and 2020

Sources: PBO based on Central Statistics Office, [Vital Statistics Annual Report 1999](#) (1999) Table [VSA29 Deaths Occurring](#) (2020) (accessed 2 August 2023).

Figure 14 outlines the mortality rate (ASR) for each of the most common cancers causing death highlighted in figure 13 above. In contrast to figure 13, figure 14 highlights how the mortality rate has decreased across most cancers among the total population, and the progress made in Ireland in reducing the fatality of cancer on patients and reflects improving survival rates. Across the total population, mortality rates have declined for lung, bowel, breast and prostate cancer, while remaining relatively stable for pancreatic cancer.

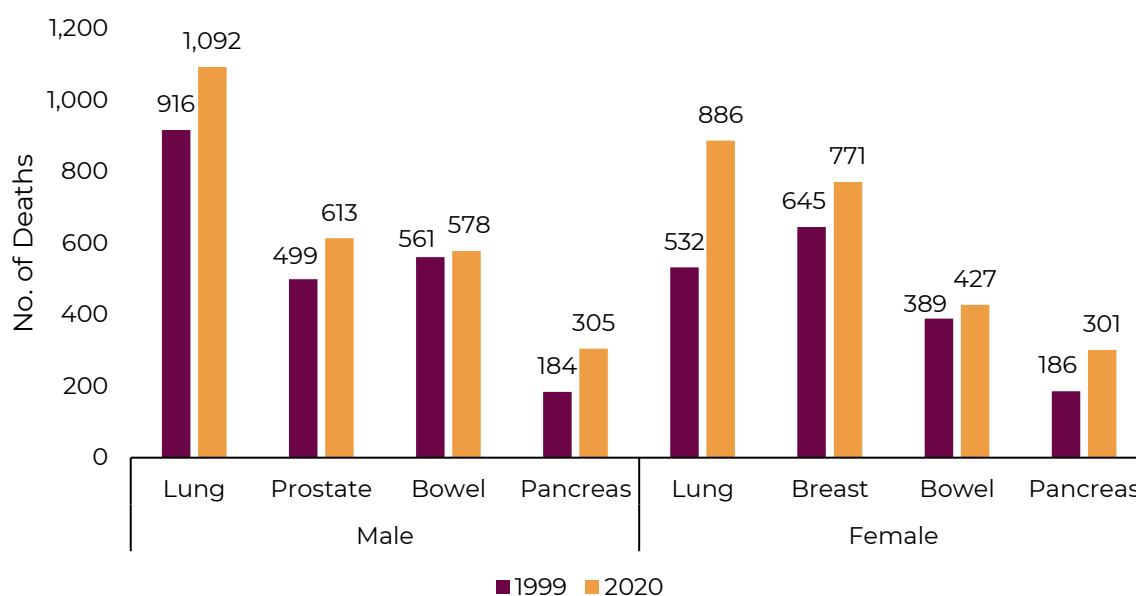
Figure 14. Mortality Rate of Common Cancers Causing Death, 1999 and 2020



Source: PBO based on cancer mortality data provided by the National Cancer Registry Ireland.

An increasing number of deaths have been attributed to lung, prostate, bowel and pancreatic cancers among males and females. Higher numbers of deaths in the male population reflect the higher incidence rates of each cancer (excl. breast cancer) compared to females (Appendix 1).

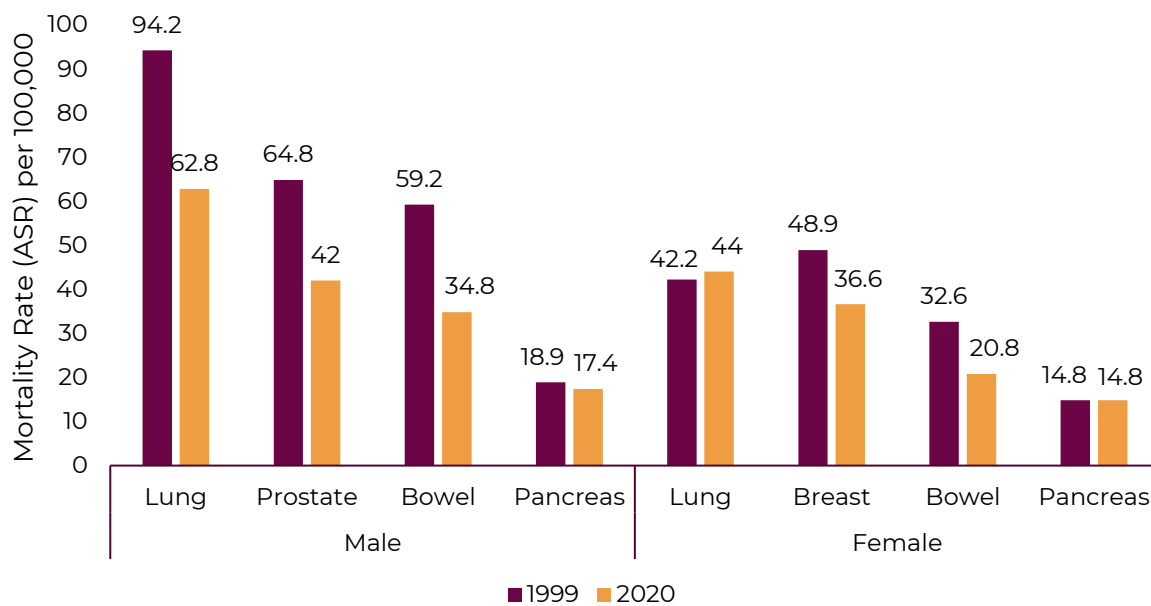
Figure 15. Most Common Cancers Causing Death by Sex, 1999 and 2020



Source: PBO based on Central Statistics Office, *Vital Statistics Annual Report 1999* (1999) Table *VSA29 Deaths Occurring* (2020) (accessed 2 August 2023).

Although the number of deaths attributed to lung, prostate, bowel and pancreatic cancer have increased among males and females; the mortality rates are broadly lower across each cancer among both sexes (see figure 16). However, the mortality rate of pancreatic cancer among females is an exception, as it remains unchanged at 14.8 per 100,000; among males it has decreased slightly from 18.9 to 17.4. Furthermore, the mortality rate of lung cancer has increased among females, from 42.4 per 100,000 to 44.

Figure 16. Mortality Rate of Common Cancers Causing Death by sex, 1999 and 2020



Source: PBO based on cancer mortality data provided by the National Cancer Registry Ireland.

4.4 Survival

Survival, as it relates to cancer, is typically measured in 5-year intervals, referred to as the 5-year net survival rate.⁷¹ As noted by the NCRI, “net survival” represents the probability of a patient surviving a given length of time (e.g., 5 years) in the hypothetical situation where cancer is the only cause of death, and is thereby an estimate of survival from cancer.⁷² As of the end of 2021, there are approximately 215,000 people living with or after cancer in Ireland; up 50% from a decade ago.⁷³

The number of patients surviving and living with cancer has also increased since the 1990s. Figure 17 below highlights this improvement. Net age-standardised survival over a 5-year period has increased from 44% (1994-

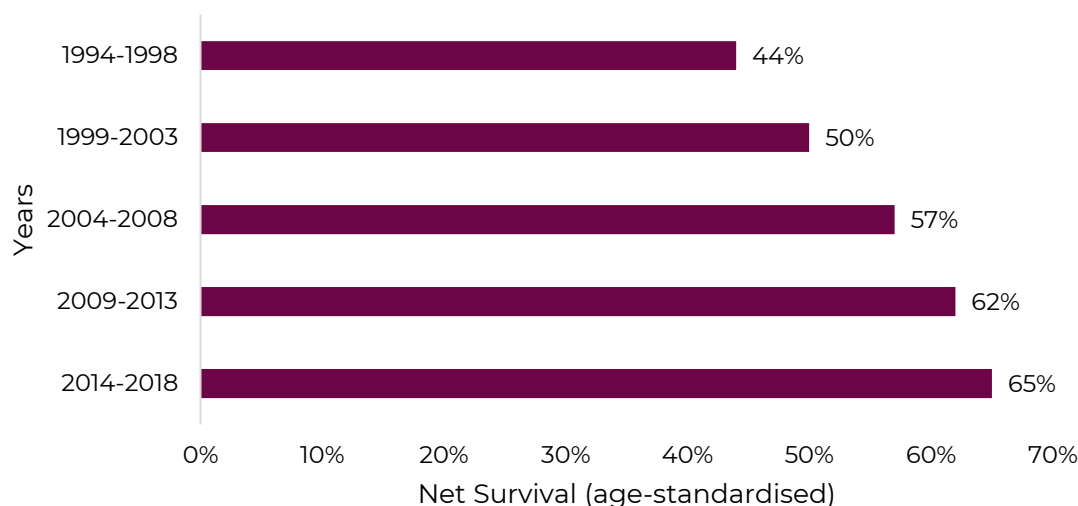
⁷¹ Hofmarcher, T., Ericson, O. & Lindgren, P. (2022) *Comparator Report on Cancer in Ireland – Disease Burden, Costs and Access to Medicines*.

⁷² National Cancer Registry Ireland (2022) *Cancer in Ireland 1994 – 2020: Annual statistical report of the National Cancer Registry*.

⁷³ National Cancer Registry Ireland (2023) *Cancer in Ireland 1994 – 2021: Annual statistical report of the National Cancer Registry*.

1998) to 65% (2014-2018). This highlights the decreasing mortality rates outlined in the previous section. The survival rate varies according to factors such as cancer type and the stage of the disease at time of diagnosis.

Figure 17. Age-standardised 5-year net Cancer Survival Rates, All Invasive Cancers excluding NMSC, 1998-2018



Source: National Cancer Registry Ireland, [Survival Statistics](#) (accessed 26 January 2024).

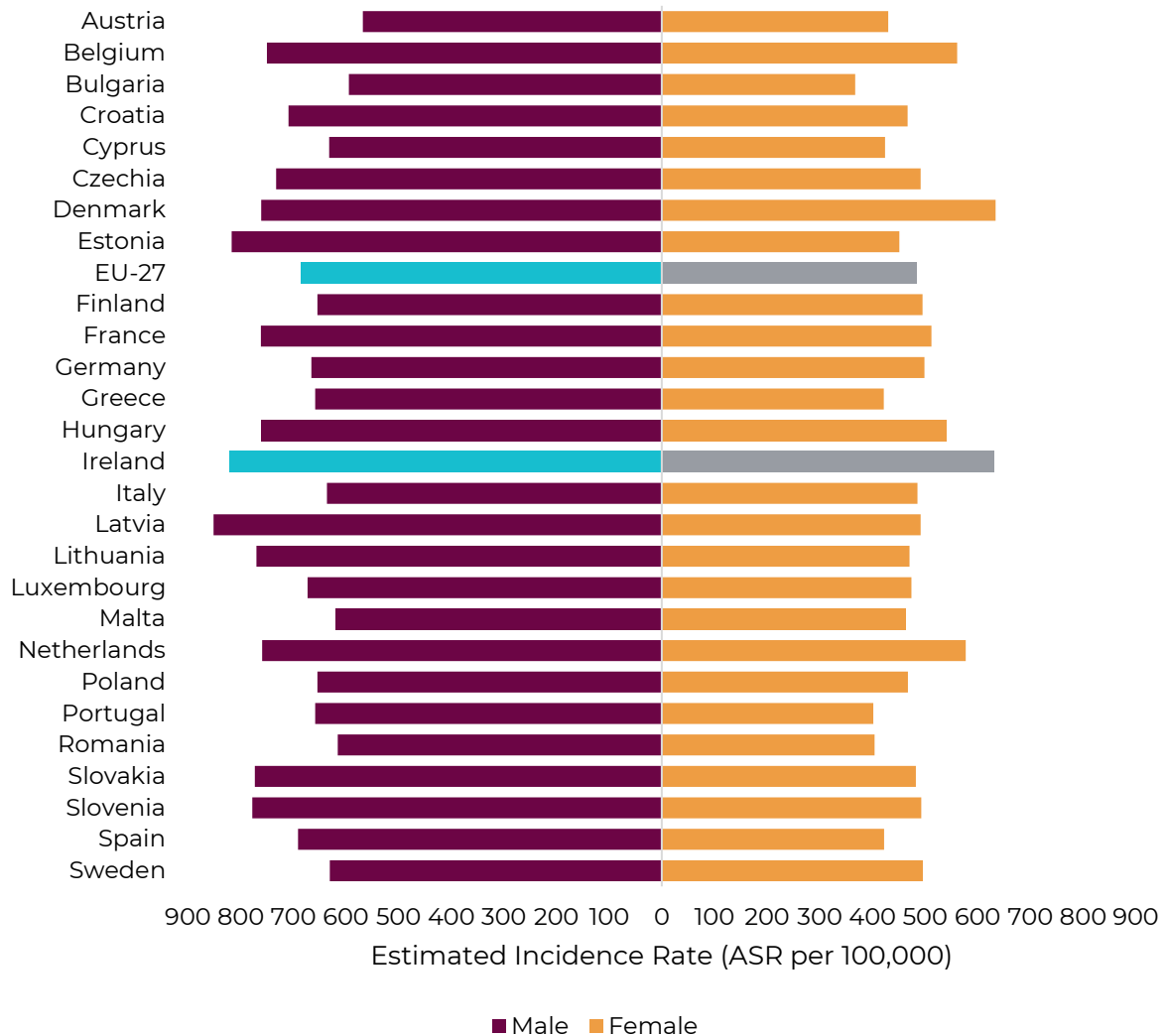
4.5 Cancer Epidemiology in a European Context

This section provides an overview of how cancer incidence, mortality and survival rates in Ireland compare with those of other EU member states. While this can be helpful to highlight how much progress has been made, or remains to be realised, in treating cancer, it is important to note that no one factor can explain the differences between any given EU member states. A range of factors such as the type of health care system, level of public health spending, and lifestyle differences among others can influence these outcomes. As such, while comparisons with groups of economically and culturally similar countries such as those found in the EU14, EU27 or even OECD groupings can be helpful in understanding where Ireland is positioned internationally, it is important to recognise the diverse set of variables underlying this position and the associated limitations.

4.5.1 Incidence

Figure 18 below presents estimates of cancer incidence (excl. NMSC) for males and females in 2022 for all EU27 countries from the European Cancer Information System (ECIS). ECIS estimates incidence rates for Ireland are above the overall rates for the EU27 for both males (821.17 ASR per 100,000) and females (631.2 ASR per 100,000). Furthermore, these estimated rates are the second highest across the EU27.

Figure 18. Estimated Cancer Incidence (excluding NMSC) per 100,000 in 2022 in the EU27

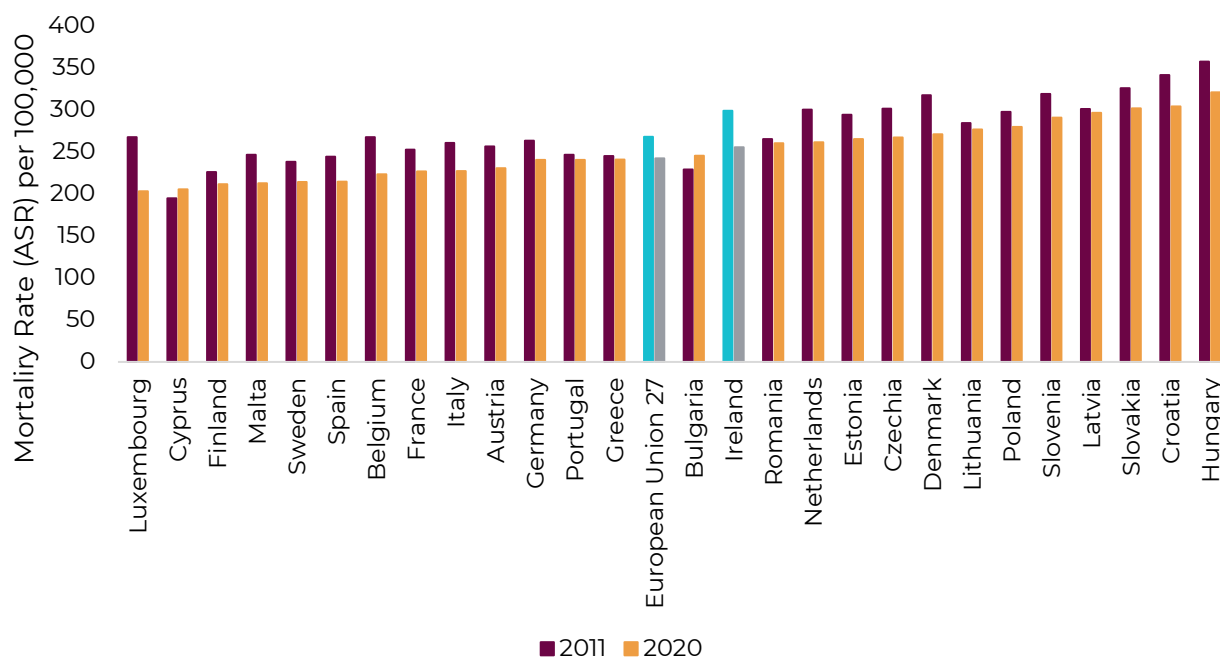


Source: European Commission, [European Cancer Information System](#) (accessed 16 October 2023).

4.5.2 Mortality

The cancer mortality rate in Ireland is also above the EU27 average (figure 19). In 2020, Ireland’s mortality rate was the 13th highest in the EU27, up from 19th highest in 2011. However, in an EU14 context, cancer mortality rates in Ireland are the third highest. This remains unchanged since 2011, despite rates declining. Notably, the reduction in the mortality rate in Ireland by 15% is the joint-third greatest decline in the EU, on par with Denmark and behind only Luxembourg (24%) and Belgium (17%).

Figure 19. Cancer Mortality (excluding NMSC) Rates in the EU27, 2011 and 2020

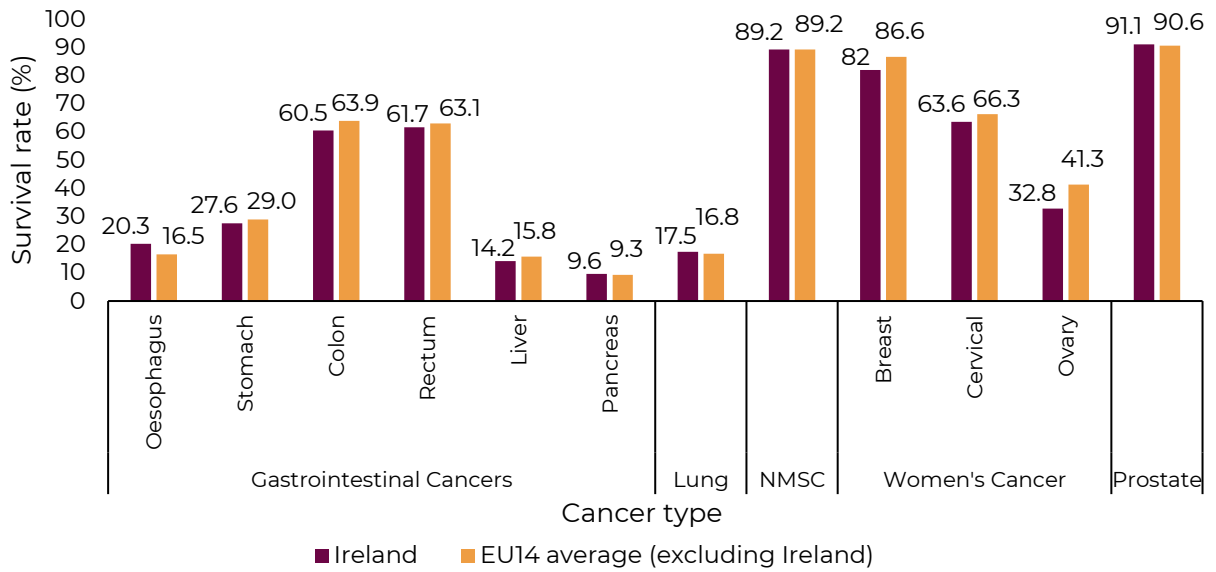


Source: PBO based on Eurostat, [Deaths due to cancer, by sex](#) (accessed 8 August 2023).

4.5.3 Survival

Figure 20 below presents 5-year survival rates in Ireland in an EU14 context for the period 2010-2014. Survival rates of people diagnosed with oesophageal cancer are higher in Ireland, and marginally higher for those diagnosed with pancreatic and lung cancers. However, survival rates are lower in Ireland across a range of common cancers including stomach, colon, rectal, and liver cancers, and are notably with regard to cancers that primarily affect women: breast, cervical and ovarian.

Figure 20. Age-standardised 5-year Cancer Survival Rates in Ireland EU14* 2010-2014



Source: PBO based on [Allemani et al. 2018](#).

Note: Excludes Greece and Luxembourg as data was not reported.

5. Conclusion

Cancer has become more prevalent in Ireland over the last two decades, and the incidence of cancer is expected to increase substantially by 2045, if current rates continue. The main driver of increased cancer incidence is demographic change, though exposure to risk factors such as alcohol consumption, UV radiation, and social deprivation remain important to consider. Projected increases in cancer incidence will require additional investment in public cancer services not only to maintain existing levels of quality care, but also to expand efforts to further improve outcomes for patients and drive down mortality rates. This can be further complemented by improved productivity and efficiency.

Since the 1990s, significant efforts have been made in Ireland's public healthcare system to diagnose and treat cancer at earlier stages to reduce its fatality. This involves the delivery of public health communication campaigns, vaccination and screening programmes, and enhanced diagnostic and treatment services. These efforts are reflected in the declining mortality rates and by a record number of people living with, and after, cancer; and exemplify the value of investing in population-based screening programmes, healthcare professionals, and high-tech medicines.

This report highlights the scale and structure of cancer services in Ireland, which reflect the complexity required to diagnose and treat the disease and support those affected. It is important to note that while cancer services are the focus of this report, there are a range of other health conditions and diseases which are also affecting the public and likely account for large proportions of healthcare spending. Therefore, this report should not be interpreted as suggesting that cancer services are more worthy of additional investment than other areas of the health service. Rather, cancer services provide an example of challenges found across the health system posed by demographic change and the absence of data; and underlines the need to ensure the investment is sustainable.

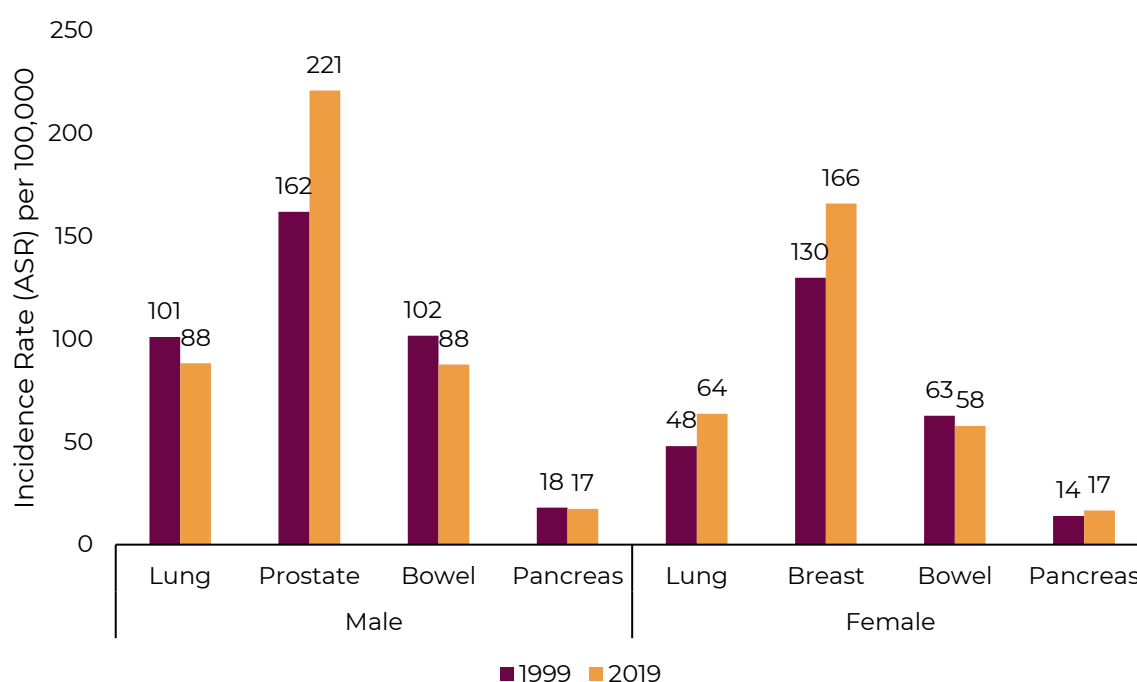
It is estimated that the level of public investment in cancer services is over €1 billion, though no official aggregate data exists to verify this estimate. Furthermore, very little disaggregate data is available. The absence of such data limits our understanding of how efficiently resources are being allocated and how outcomes in Ireland fare in comparison to EU and OECD counterparts. A small number of OECD countries provide regular estimates of the direct costs of cancer and other conditions to their healthcare systems. Further research on and consideration of the application of similar approaches in Ireland would be welcome. The availability of cost-of-illness data or estimates would be valuable to

members of the Oireachtas and those responsible for budgetary oversight, not only in understanding the current level of public investment in and future requirements of cancer services, but also across the various care programmes delivered within and across the public health service.

Appendix 1: 1999 and 2019 Incidence Rates of Most Common Cancers Causing Death in 2020

Figure 21 below presents the incidence rates for those cancers which were most commonly responsible for causing death in 2020 (see figure 15). While incidence rates have increased for prostate and breast cancer, the respective mortality rates have declined considerably. Incidence rates can also help to explain variance in mortality among the male and female populations. Figure 16 highlighted greater rates of mortality among the male population from lung, bowel, and pancreatic cancers. However, figure 21 below illustrates that the incidence rate of these cancers being diagnosed in the male population has historically been higher when compared to the female population, with the exception of pancreatic cancer, where incidence rates in 2019 were equal.

Figure 21. Incidence Rates (1999 and 2019) of Most Common Cancers causing Death in 2020



Source: PBO based on data provided by the National Cancer Registry Ireland.

Appendix 2: Quality Assurance Process

Quality Assurance Process:

To ensure the accuracy and methodological rigor in this research, the authors engaged in the following quality assurance process.

✓ Internal / Departmental

- ✓ Line management
- ✓ Other divisions/ sections
- ✓ Peer review

✓ External

- ✓ Other Government Department(s)
- ✓ External Experts – NCRI

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