Prescient

powered by the Dolon Institute

The Transformative Value of Cancer Medicines in Europe.

Prepared by Dolon Ltd for
EFPIA Oncology Platform

Elisa Garau
Katarina Kitarovic
Adam Hutchings
Elena Nicod

September 2025

Contents

Introduction 3

Cancer is a leading cause of mortality and disease burden in Europe, representing a growing public health crisis and an area of significant unmet need 4

Pharmaceutical innovation has been a key driver of progress in cancer care, transforming outcomes for patients and creating value for health systems and society 7

Although spending on cancer has been increasing with the introduction of new products, investment in innovative cancer therapies remains sustainable for health systems, contributing to economic growth and generating value beyond the direct treatment 9

While progress in cancer has brought many patients closer to a cure, cancer remains a complex and varied set of diseases. Continued innovation is essential to ensure that all individuals, regardless of cancer type, have access to effective and life-changing treatments 13

Cancer care is at a turning point. Breakthroughs are bringing cures within reach and with continued investment, we can ensure the next wave of innovative therapies reaches every patient across Europe 15

References 16

Appendix 20

Introduction

While cancer continues to pose a major public health challenge, strong European Union (EU)-level efforts, along with advances in prevention, diagnosis and sustained treatment innovation have led to meaningful progress. Survival rates have improved markedly for many cancers – often through steady, incremental advances; many people with advanced cancers are now able to live a decade or more with treatment. However, there are still a number of cancer types for which prognosis remains poor and treatment options limited, highlighting the urgent need to accelerate and expand development.

At the same time, the policy environment for cancer innovation is becoming increasingly challenging. Growing scrutiny over oncology spending, especially on new medicines, and a perception of limited benefit are hampering the development and funding of innovative therapies.[1]

Within this overall context, access for current and future patients is being threatened. Europe is falling behind in global R&D, developing fewer medicines and hosting fewer clinical trials.[2] In 2023, China overtook Europe in launching new active substances, pushing the EU to third place.[3] Meanwhile, regulatory and reimbursement hurdles delay or restrict access to existing treatments. Since 2020, the EFPIA W.A.I.T. indicator has shown a decline in oncology medicine availability across Europe.[4]

Share Of Oncology Trial Starts By Company Headquarters Location, 2009-2024

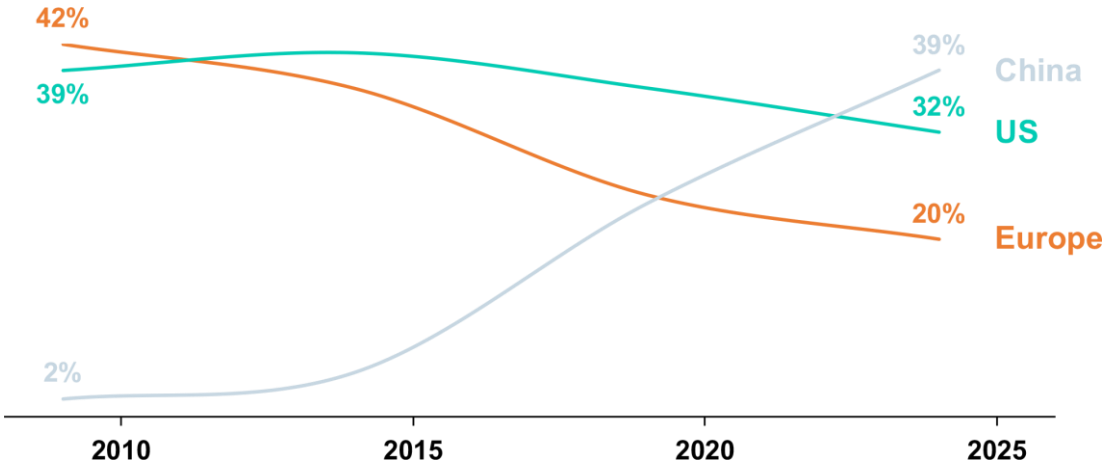

Figure 1. Europe is falling behind the US and China in oncology trial starts.[5]

Although policymakers have launched several initiatives to strengthen Europe's response to cancer, including Europe's Beating Cancer Plan and the EU Cancer Mission, these efforts have not been enough to turn the receding tide of access to medicines. With cancer rates projected to rise in the coming years due to unavoidable demographic shifts, there is a growing need for decisive policy intervention. This projected increase underscores the urgency of investing in medicines that can alter the trajectory of the disease and removing structural barriers in the innovation and access ecosystem through coordinated action. Given this context, it is important to foster a shared understanding and appreciation of the value of today's cancer medicines and how incremental innovation in care will continue to advance the fight against cancer.

[1] IQVIA, "Global Oncology Trends 2024"; Brinkhuis et al., "Added Benefit and Revenues of Oncology Drugs Approved by the European Medicines Agency between 1995 and 2020."
[2] IQVIA Institute, "Global Trends in R&D 2025."
[3] EFPIA, "The Pharmaceutical Industry in Figures."
[4] EFPIA, "The Root Cause of Unavailability and Delay to Innovative Medicines: Reducing the Time before Patients Have Access to Medicines."
[5] IQVIA Institute, "Global Oncology Trends 2025."

Therefore, this white paper examines the evolving burden of cancer across Europe and underscores the transformative role that cancer medicines play in improving patient outcomes, strengthening health systems, and benefiting society as a whole. By showcasing the holistic value of cancer medicines, this paper takes a broader perspective by looking beyond patient outcomes, to examine the positive effects on workforce productivity, indirect costs, economic growth, and European sovereignty and resilience of supporting cancer innovation. In doing so, it highlights the urgent need to unlock the full potential of innovation and ensure equitable access to care. Sustained commitment and cohesive policies are essential to accelerate development of new medicines and ensure that every patient across Europe benefits from the full potential of modern cancer care.

Cancer is a leading cause of mortality and disease burden in Europe, representing a growing public health crisis and an area of significant unmet need

Rising cancer incidence and mortality, which now increasingly affects younger populations, reflect its growing physical and psychological toll on patients and their caregivers

Despite significant efforts at the EU and national levels, cancer remains one of Europe's leading causes of death and disability, accounting for 23% of all deaths in 2022 and 17% of disability-adjusted life years (DALYs)[6] in 2021.[7] Between 1995 and 2022, cancer mortality in Europe increased by 9%, from 238 to 259 deaths per 100,000 inhabitants, and as many as one in four Europeans are now expected to develop the disease.[8] Although the rate of increase in mortality is slower than the rise in incidence, reflecting improvements in survival outcomes for some patients, the overall burden of cancer continues to grow and requires attention. Today, more people are living with cancer than ever before: prevalence has increased by over 20% in the EU over the past 10 years, and an average of 5% of the European population has had a recent or distant history of cancer as of 2020.[9] By 2040, cancer cases in the EU and European Free Trade Association (EFTA) countries are projected to reach 3.4 million, representing a 21.4% increase compared to 2020, driven primarily by rising incidence and an aging population.[10]

[6] One disability-adjusted life year (DALY) represents one year of healthy life lost due to disease, disability, or early death. This measure counts both years of life lost and years lived with disability.
[7] WHO, "Leading Causes of DALYs"; WHO, "Leading Causes of Death."
[8] WHO, "Up to a Quarter of Europeans Will Develop Cancer"; Manzano et al., "Comparator Report on Cancer in Europe 2025," IHE, 2025
[9] OECD and European Commission, *EU Country Cancer Profiles Synthesis Report 2025*; De Angelis et al., "Complete Cancer Prevalence in Europe in 2020 by Disease Duration and Country (EUROCARE-6)."
[10] Dyba et al., "1501O Long-Term Estimates of Cancer Incidence and Mortality for the EU and EFTA Countries According to Different Demographic Scenarios."

Leading Causes of Disability and Death in Europe

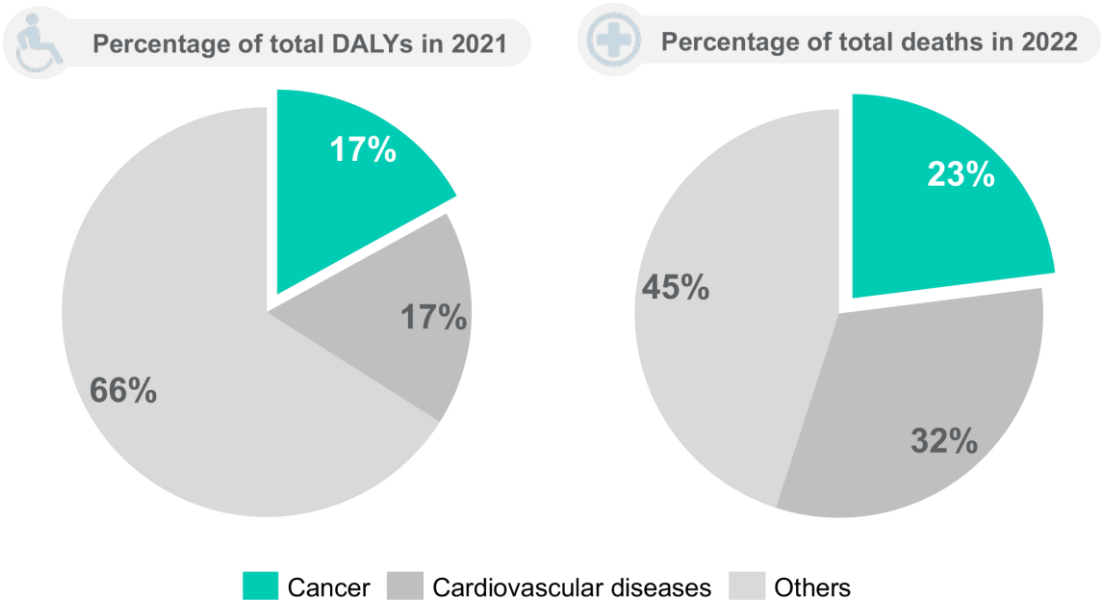

Figure 2. Cancer is a leading cause of death and disability-adjusted life years in Europe. Abbreviations: DALY: disability-adjusted life year. Adapted from WHO.[11]

The increasing rates amongst younger populations, alongside the significant impacts on mental health and quality of life for patients and caregivers alike, are also a growing concern for health systems and society. Firstly, cancer is no longer confined to older populations: early-onset cancer incidence has risen by 79% globally since 1990, increasingly affecting people in the prime of their lives and disrupting careers, families, and long-term life plans, with a significant spillover effect on society and productivity.[12] Data from the US suggest that Generation X has a higher incidence of cancer than Baby Boomers, and a similar pattern may be emerging in Europe as well. This trend is likely driven by lifestyle and environmental factors (such as poor diet, physical inactivity, pollution, etc.), as well as by improvements in diagnosis and screening, all of which contribute to the complexity of cancer burden across populations.[13] The quality of life is equally significant: one in four patients experience depression, contributing to an estimated 85,000 new cases across the EU each year.[14] Moreover, approximately 45% of cancer patients and survivors experience pain that affects their ability to participate in daily activities.[15] Finally, between 10.4-34.5% of cancer survivors live with long-term disability, according to a literature review of high-income countries, placing a considerable strain on individuals and healthcare systems.[16]

[11] WHO, "Leading Causes of DALYs"; WHO, "Leading Causes of Death."
[12] Zhao et al., "Global Trends in Incidence, Death, Burden and Risk Factors of Early-Onset Cancer from 1990 to 2019."
[13] Rosenberg and Miranda-Filho, "Cancer Incidence Trends in Successive Social Generations in the US."
[14] OECD, *Tackling the Impact of Cancer on Health, the Economy and Society*.
[15] Snijders et al., "Update on Prevalence of Pain in Patients with Cancer 2022."
[16] Lisy et al., "The Prevalence of Disability among People with Cancer, Cardiovascular Disease, Chronic Respiratory Disease and/or Diabetes."

The economic burden of cancer is considerable, encompassing both direct healthcare costs and substantial indirect costs, largely driven by productivity losses among patients and their caregivers

In addition to its profound health effects, cancer imposes significant economic consequences that amplify its overall burden. Each year, the EU loses the equivalent of 1.1 million full-time workers due to cancer-related disability or treatment demands.[17] In the UK, it is estimated that premature deaths have resulted in a productivity loss of over £1 billion in 2023, which is projected to stand at £9.57 billion by 2040.[18] By 2050, cancer is expected to result in the loss of 38 and 43 full-time workers per 100,000 people in the EU due to absenteeism and presenteeism, respectively.[19] Even after recovery, survivors face ongoing challenges, being 7–10% less likely to be employed compared to those without a cancer history.[20] The economic toll also extends to caregivers, many of whom experience emotional stress, disrupted careers, and financial hardship; 42% of caregivers suffer from depression as a result of cancer.[21]

Taken together, these factors position cancer as a complex and urgent public health challenge, highlighting the critical unmet medical need. Addressing it requires bold, coordinated action to strengthen prevention, improve diagnosis, and accelerate treatment development and access, expanding support for patients and their families.

Key Insights

- **Rising incidence:** Cancer cases are rising - up to a quarter of Europeans will develop cancer during their lifetimes and the incidence of early onset cancer (before age 50) has surged by 79% since 1990
- **Increasing mortality:** Despite advances in care, cancer deaths have increased by 9% across the EU since 1995
- **Leading cause of disease burden:** Cancer accounts for 23% of all deaths in 2022 and 17% of DALYs in 2021
- **Mental health burden:** Cancer takes a psychological toll on patients and caregivers alike, leading to 85,000 additional cases of depression per year in the EU, and symptoms in 42% of caregivers
- **Impaired quality of life:** 45% of cancer survivors suffer from pain, and between 10-35% of survivors live with long-term disability, impacting their ability to participate in daily activities
- **Significant socioeconomic burden:** The equivalent of 1.1 million full time workers are lost annually in the EU due to cancer

[17] OECD, *Tackling the Impact of Cancer on Health, the Economy and Society*.
[18] CRUK, "CRUK Analysis Brief: Economic Losses Due to Cancer Mortality."
[19] OECD and European Commission, *EU Country Cancer Profiles Synthesis Report 2025*.
[20] OECD, *Tackling the Impact of Cancer on Health, the Economy and Society*.
[21] Chiu et al., "Estimating Productivity Loss from Breast and Non–Small-Cell Lung Cancer among Working-Age Patients and Unpaid Caregivers"; Bedaso et al., "Depression among Caregivers of Cancer Patients."

Pharmaceutical innovation has been a key driver of progress in cancer care, transforming outcomes for patients and creating value for health systems and society

Cancer accounts for the largest share of new drug indications making it a major driver of pharmaceutical innovation, and has significantly reduced cancer-related mortality, prevented countless deaths, and improved quality of life for patients

Over the past decade, pharmaceutical research has made remarkable strides, delivering life-saving treatments and helping to alleviate pressure on healthcare systems. Cancer has been at the forefront of this progress, representing the largest share of medicines in development, with 38% of product indications in the pipeline in 2020.[22] These R&D efforts are translating into real-world impact: in 2024, cancer medicines accounted for 30% of all new Food and Drug Administration (FDA) approvals, 24% of European Medicines Agency (EMA) approvals, and 29% of novel first-in-class drugs, reaffirming oncology as the leading therapeutic area.[23] Thanks to continued advances, cancer treatments are not only extending and improving patients' lives, but also contributing to more efficient healthcare delivery and driving broader social and economic benefits.

Progress in oncology care has led to meaningful, measurable improvements – reducing mortality and enhancing patients' quality of life. Between 1989 and 2022, advances in cancer care, diagnostics and treatment are estimated to have prevented 5.4 million deaths across Europe.[24] Beyond extending lives, these developments are contributing to better quality of life, meaning fewer symptoms and side effects, greater emotional and physical well-being, reduced time spent in hospitals, and an increased ability to work, socialise, and participate in daily activities, among other improvements. As of 2022, an estimated 1.1 million quality-adjusted life years (QALYs)[25] – years of perfect health – were gained in Europe thanks to progress in cancer care since 2012 – highlighting the broad and sustained impact of continued advancements on patient lives.[26] Moreover, improving the quality of survivor's lives also has a consequential effect at the societal level, in terms of higher productivity and participation.

Disruptive advances, such as immunotherapies and targeted treatment, are redefining the realm of possibilities in cancer care, with some cancers even now making significant progress towards a cure

Immunotherapy has delivered remarkable benefits for select patients with certain cancers, such as metastatic melanoma, lung, and renal cancer. In the case of melanoma, novel immune checkpoint inhibitors have raised survival rates from just 5% at five years to as high as 52% at ten years.[27] Meanwhile, in oestrogen receptor-positive (ER+) metastatic breast cancer, the median survival has nearly doubled over the past four decades, due to the introduction of targeted therapies, CDK4/6 inhibitors, oral SERD, and antibody-drug conjugates.[28] These therapies not only provide transformative benefits today, but also renewed hope for patients with cancers that still lack effective treatment options.

[22] OECD, *Health at a Glance 2023*.
[23] CDER, "Novel Drug Approvals for 2024"; EMA, "Human Medicines in 2024."
[24] Dalmartello et al., "European Cancer Mortality Predictions for the Year 2022 with Focus on Ovarian Cancer."
[25] One quality-adjusted life year (QALY) represents 1 year of life lived in perfect health. This measure combines both quantity and quality of life gained from a treatment; each year lived in less than perfect health is adjusted down to reflect how well people are living, e.g. a person's ability to carry out the activities of daily life, and freedom from pain and mental disturbance.
[26] See Appendix for Dolon metrics.
[27] NHS Foundation Trust, "Over Half of Advanced Melanoma Patients Treated with Combination Immunotherapy Drugs Survive the Disease for at Least 10 Years"; Wolchok et al., "Final, 10-Year Outcomes with Nivolumab plus Ipilimumab in Advanced Melanoma."
[28] Cardoso et al., "5th ESO-ESMO International Consensus Guidelines for Advanced Breast Cancer (ABC 5)"; Bidard et al., "Elacestrant (Oral Selective Estrogen Receptor Degrader) Versus Standard Endocrine Therapy for Estrogen Receptor–Positive, Human Epidermal Growth Factor Receptor 2–Negative Advanced Breast Cancer"; Modi et al., "Trastuzumab Deruxtecan in Previously Treated HER2-Low Advanced Breast Cancer"; Hortobagyi et al., "Overall Survival with Ribociclib plus Letrozole in Advanced Breast Cancer"; Harbeck et al., "Breast Cancer"; Caswell-Jin et al., "Change in Survival in Metastatic Breast Cancer with Treatment Advances"; Slamon et al., "Overall Survival with Ribociclib plus Fulvestrant in Advanced Breast Cancer"; Sledge et al., "The Effect of Abemaciclib Plus Fulvestrant on

As a result of these advances, some cancers, such as melanoma, are now making significant progress towards a cure. This progress reflects both major scientific breakthroughs and the cumulative effect of incremental gains, each one helping to shift the trajectory of cancer care toward a more hopeful and transformative future. Incurable diseases, such as multiple myeloma, have also shown marked improvement in survival as a consequence of incremental, continuous, sustained innovation. Overall, these developments parallel the experience in HIV/AIDS, where incremental innovation has transformed the disease from a terminal condition into a manageable, chronic disease; nevertheless, continued treatment and innovation remain essential to maintain long-term control and quality of life.

Five-year Relative Survival for Multiple Myeloma Over Time

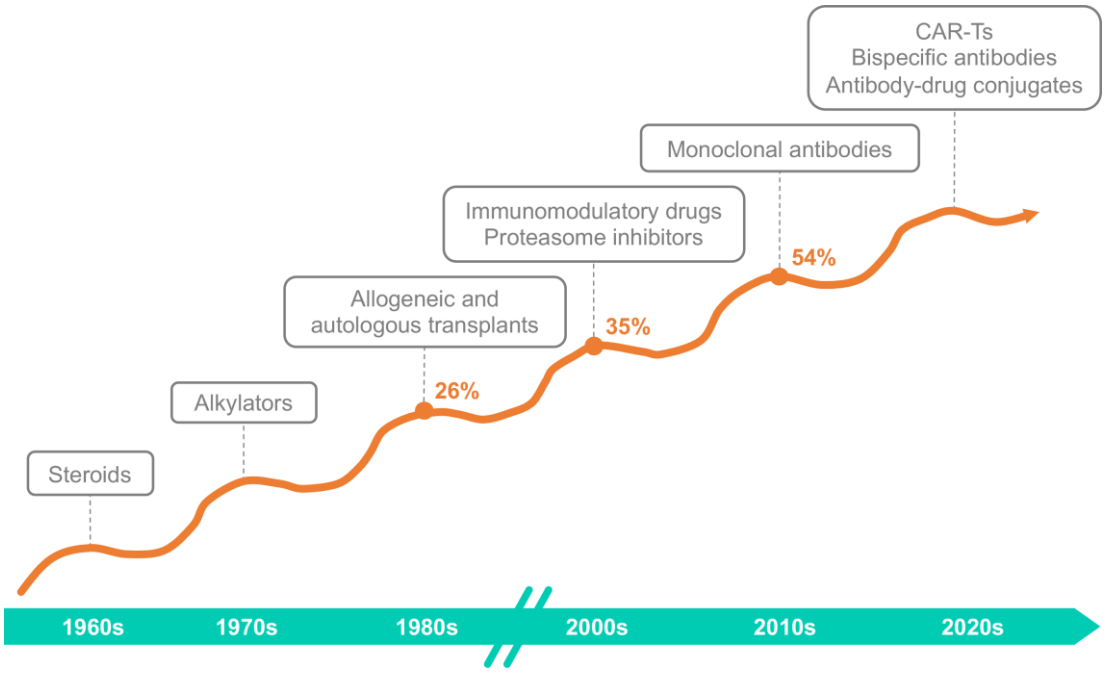

Figure 3. Incremental gains from advances in multiple myeloma have resulted in marked improvements in patient outcomes. Abbreviations: CAR-T: chimeric antigen receptor T-cell. Adapted from Shah and Mailankody.[29]

Key Insights

- **Cancer medicines are at the forefront of innovation:** Oncology treatments accounted for 24% of EMA approvals and 29% of first-in-class drugs approved by the FDA in 2024
- **Advancements in cancer medicines save lives:** Between 1988 and 2022, advances in cancer diagnostics and treatment are estimated to have prevented 5.4 million deaths across Europe
- **Improvements in treatment reduced morbidity and enhanced quality of life:** As of 2022, 1.1 million QALYs were gained compared to 2012
- **Treatment advances have transformed outcomes:** Melanoma survival has increased from 5% at five years to 52% at ten years due to the introduction of checkpoint inhibitors, and ER+ metastatic breast cancer survival has nearly doubled since the 1980s, driven by pharmaceutical innovation

Overall Survival in Hormone Receptor-Positive, ERBB2-Negative Breast Cancer That Progressed on Endocrine Therapy."

[29] Shah and Mailankody, "Emerging Immunotherapies in Multiple Myeloma."

Although spending on cancer has been increasing with the introduction of new products, investment in innovative cancer therapies remains sustainable for health systems, contributing to economic growth and generating value beyond the direct treatment

While cancer is one of the leading causes of disability and mortality, cancer spending remains a stable and relatively small share of total health expenditure compared to its overall burden, highlighting its sustainability within health budgets

Progress in cancer care has accelerated and access to new therapies has expanded, but cancer-related spending has remained relatively stable and sustainable from a health system point of view, delivering strong value for patients, healthcare systems, and society as a whole.

Cancer Care as a Proportion of Total Health Expenditure in Europe

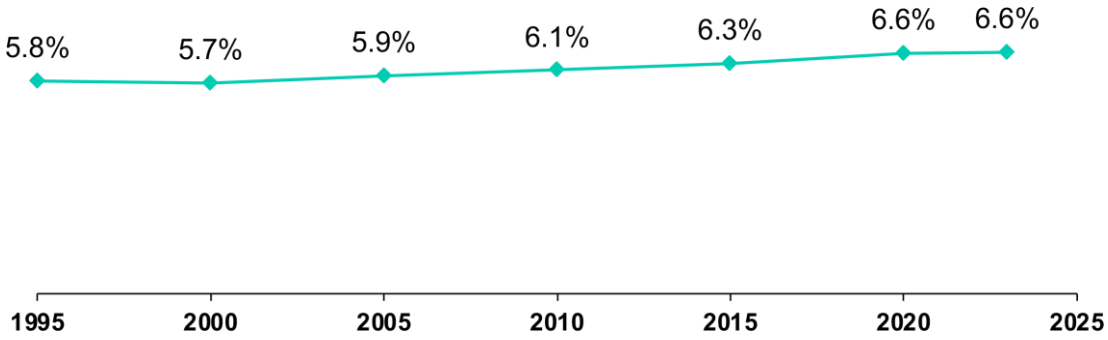

Figure 4. At current prices, cancer spending as a proportion of total health expenditure in Europe has remained relatively stable since 1995.[30]

Nonetheless, concerns from policymakers and payers have emerged in recent years about increasing pharmaceutical expenditure on cancer in comparison to other therapeutic areas.[31] Yet, despite being a leading cause of disability and death, cancer accounts for a relatively modest and consistent share of total health expenditure. In 2023, total expenditure on cancer, including medicines, hospital services, outpatient care, and other costs, represented approximately 6.6% of health budgets across Europe, a proportion that has remained steady and aligned with overall healthcare expenditure growth since 1995.[32] In total, only 2.97% of total health expenditure is allocated toward cancer medicines.[33] This share stands in contrast to cancer's actual burden: between 2021 and 2022, cancer was responsible for 17% of DALYs and 23% of all deaths in Europe.[34] Moreover, the reported growth is based on list prices, while net prices are substantially lower due to confidential rebates.[35]

Although concerns persist about a potential rise in future expenditure, particularly with the emergence of high-cost, novel therapies, long-term sustainability will benefit from the growing availability of generics and biosimilars as more oncology drugs lose market exclusivity.[36]

[30] Dolon analysis of Manzano et al., 2025 data.
[31] ESIP and MEDEV, "Trends in Pharmaceutical Expenditure"; WHO, "Pricing of Cancer Medicines and Its Impacts."
[32] Manzano et al., "Comparator Report on Cancer in Europe 2025," IHE, 2025
[33] Dolon analysis of Manzano et al., 2025 data.
[34] WHO, "Leading Causes of DALYs"; WHO, "Leading Causes of Death."
[35] Manzano et al., "Comparator Report on Cancer in Europe 2025," IHE, 2025; OECD, *Tackling the Impact of Cancer on Health, the Economy and Society*.
[36] OECD, *Tackling the Impact of Cancer on Health, the Economy and Society*.

Burden of Cancer vs. Cancer Expenditure in Europe

Figure 5. Share of total health expenditure spend on cancer is much smaller than the share of burden. Abbreviations: DALY: disability-adjusted life year. Adapted from WHO, 2024 and IHE, 2025.

Cancer therapies provide a high return on investment, with the cost per life year gained falling well below standard cost-effectiveness thresholds

Rather than being viewed as a mere expense, cancer treatments should be recognised as high-value investments. In Spain, for example, the estimated drug expenditure per life year gained[37] before age 75 from cancer medicines approved between 2000 and 2016 was just €3,269.[38] Not only does this show that new medicines contributed to extending patient lives, but that the cost of these gains is significantly lower than the typical amount the healthcare system is willing to pay for good health. In Spain, the commonly accepted cost-effectiveness thresholds - the maximum amount the healthcare system is willing to pay - range between €22,000 and €25,000 per QALY.[39] Even considering that the life years gained may not be in perfect health, the average level of daily impairment for cancer survivors is small enough that the health gains can be considered cost-effective.[40] This demonstrates that new cancer treatments may provide more value for money than often assumed. In fact, cost-effectiveness analyses for new cancer medicines often return much higher costs per QALY gained when initially estimating value for money. This is partly because initial modelling is based on outcomes data from a relatively short period of time (the duration of the clinical trial) and only considers the cost at launch, not accounting for discounting of the price over time.[41] The Spanish analysis takes a much longer time horizon, which is able to reflect some of these real-life developments, although uncertainties remain.[42] Spain is just one example, however, and similar analyses are needed to understand these outcomes across countries, as differences in medicine reimbursement levels, pricing dynamics, and societal willingness-to-pay thresholds across Europe may limit the generalisability of the findings.

[37] Life years gained simply measure by how much medicines extend lives. Unlike for QALYs, there is not adjustment for quality of life years lived.
[38] Lichtenberg, "The Relationship Between Pharmaceutical Innovation and Cancer Mortality in Spain, From 1999 to 2016.".
[39] Vallejo-Torres et al., "Estimating a Cost-Effectiveness Threshold for the Spanish NHS."
[40] Zhou et al., "Health-Related Quality of Life in Patients With Different Diseases Measured With the EQ-5D-5L."
[41] Lichtenberg, "The Relationship Between Pharmaceutical Innovation and Cancer Mortality in Spain, From 1999 to 2016."
[42] These include the inability to isolate causal effects with certainty due to the observational nature of the study, potential confounding from non-pharmaceutical innovations (e.g. improvements in diagnostics and surgical techniques), and not accounting for how widely individual drugs are used across cancer sites.

At a broader European level, the value is even more striking. In 2022, improvements in cancer care, treatment, and diagnostics since 2012 saved an estimated 1.44 million life years across Europe, equating to 1.1 million years of perfect health gained (QALYs)[43] We estimate the total value of health gains driven by pharmaceutical innovation amount to €29.2 billion (range: €7.5 - €63.3 billion), underscoring the immense societal return from investing in cancer advancements.[44]

Value of Cancer Health Gains Attributable to Pharmaceutical Innovation (€ billions)

		Value per QALY		
		Low (€34.8k)[1]	Medium (€58k)[2]	High (€80k)[3]
Percentage of health gains attributable to pharmaceutical innovation	20%	€7.5	€12.6	€17.3
	46.5%	**€17.5**	**€29.2** (Median value)	**€40.3**
	73%	€27.5	€45.9	€63.3

[1]Based on the NICE cost-effectiveness threshold, conversion: £1 = €1.16
[2]Based on the NICE cost-effectiveness threshold for severe diseases, conversion: £1 = €1.16
[3]Based on the ZIN cost-effectiveness threshold for severe diseases

Figure 6. Value of cancer health gains attributable to pharmaceutical innovation in Europe. The monetised value of health gains achieved by pharmaceutical innovation in cancer is dependent on the percent of the gain attributable to pharmaceutical industry and the value per QALY, which have been derived from the literature. Abbreviations: NICE: National Institute for Health and Care Excellence; QALY: quality-adjusted life year; ZIN: Zorginstituut Nederland. *For full analysis, see Appendix.*

[43] Dolon Analysis of OECD and European Commission, 2025.
[44] See Appendix for Dolon metrics.

Additionally, countries that invest more per capita in cancer care tend to achieve better survival outcomes, highlighting the value of sustained and strategic investment, even as marginal gains may diminish over time.[45] Spending alone does not fully account for these differences, and factors such as efficiency in care organisation, access to services, and lifestyle differences also play a significant role, helping to explain variations in outcomes among high-expenditure countries. Nevertheless, taken together, these insights make a clear case for strengthening, not reducing, investment in cancer care to match the scale of the challenge and ensure continued progress.

Investment by the pharmaceutical industry in cancer innovation has widespread impacts across the entire EU economy, contributing not only to health outcomes, but also to lowering productivity losses and indirect costs, and to fuelling job creation, research, and economic growth

The benefits of advances in cancer care extend well beyond improved health outcomes. Investment in cancer innovation also contributes to economic resilience, increased productivity, and wider social impact. Since 1995, advancements in cancer care have led to a 33% reduction in potential years of working life lost, resulting in a 16% drop in indirect costs from premature death and morbidity, from €97 billion in 1995 to €82 billion in 2023.[46] This reflects fewer working-age deaths, less time off work and reduced early retirement.

These outcomes have been made possible through sustained research efforts, with the pharmaceutical industry playing a pivotal role together with academia, public research institutions, and the broader health system. In particular, pharmaceutical companies take on significant financial risk and investment to develop and deliver innovative therapies, accounting for approximately 63% of total biopharmaceutical R&D investment.[47]

The economic contribution of the pharmaceutical sector extends well beyond R&D. The pharmaceutical sector is a vital engine of Europe's innovation, economy and growth. In 2022 alone, it contributed €363 billion in production, €683 billion in exports, and €475 billion in imports, while investing €47 billion in R&D.[48] Oncology R&D played a major role in this activity, contributing an estimated €53.7 billion in gross value added[49] to the European economy and creating 49,400 jobs in R&D across Europe in 2022.[50] This investment not only fuels innovation, but also delivers a multiplier effect across the broader economy. For example, in Italy, every euro invested in the pharmaceutical sector generates €2.60 in economic returns, according to a recent report.[51] This shows that, by attracting highly skilled and educated individuals, the pharmaceutical industry is able to induce positive growth in other parts of the economy. Therefore, investment in cutting-edge medicines is not only transforming patient outcomes, but also driving economic growth, job creation, and scientific leadership.

Given this strong return on investment – across wide-ranging benefits for patients, caregivers, health systems, and society – sustained and strategic support for oncology advances should be a cornerstone of both health policy and Europe's broader economic strategy.

[45] Choi et al., "Global Comparison of Cancer Outcomes"; Manzano et al., "Comparator Report on Cancer in Europe 2025," IHE, 2025
[46] Manzano et al., "Comparator Report on Cancer in Europe 2025," IHE, 2025
[47] Fowler et al., "Quantifying Public and Private Investment in European Biopharmaceutical Research and Development."
[48] EFPIA, "The Pharmaceutical Industry in Figures."
[49] Gross value added is a measure of the value of goods and services produced by the pharmaceutical industry, calculated as the value of the output minus the cost of production.
[50] See Appendix for Dolon metrics.
[51] Roche, "Multiplier Effect: Roche Contributes over 700 Million Euros to GDP and Is a Driving Force for Development, Including Employment, Research, and the Environment."

Key Insights

- **Cancer expenditure is low compared to its overall burden:** In 2023, cancer accounted for only 6.6% of health expenditure, a stark contrast to the 23% of total deaths and 17% of total DALYs attributed to the disease in Europe during 2021 and 2022
- **Cancer medicines offer strong value for money:** In Spain, the estimated cost per life year gained for cancer medicines approved between 2000-2016 was ~ €3,300 – lower than the typical willingness to pay threshold for that health system
- **Advancements in cancer medicines save lives and generate significant economic value:** In 2022 alone, improvements since 2012 saved an estimated 1.44 million life years across Europe, valued at approximately €29.2 billion
- **Progress in cancer treatment drives societal efficiencies:** Since 1995, advancements in cancer care have led to a 33% reduction in potential years of working life lost and a 16% decrease in indirect costs, driven by fewer premature deaths and lower morbidity
- **The pharmaceutical industry has a profound economic impact:** In 2022 alone, the pharmaceutical industry as a whole contributed to €363 billion in production, €683 billion in exports, and €475 billion in imports in Europe, while investing €47 billion in R&D
- **Oncology R&D funded by the pharmaceutical industry is a key driver of economic value:** Oncology R&D on its own contributed an estimated €53.7 billion in gross value added to the European economy in 2022, creating 49,400 jobs in 2022

While progress in cancer has brought many patients closer to a cure, cancer remains a complex and varied set of diseases. Continued innovation is essential to ensure that all individuals, regardless of cancer type, have access to effective and life-changing treatments

With over 100 distinct types, cancer's inherent complexity, diversity, and variability in patient response make continued, incremental innovation essential to ensure more people can benefit from effective treatments

Cancer is a highly complex and often unpredictable disease, encompassing over 100 distinct types that affect nearly every part of the body and differ significantly in their biology. In addition to this diversity, there is a growing understanding that cancer can also be highly specific at the personal level, with individual genetic and molecular characteristics influencing how the disease behaves and responds to treatment. This complexity – and the disease's ability to evolve and resist therapies – makes continuous, incremental innovation essential to reaching more patients with therapies that improve outcomes and extend lives. Yet, stark disparities remain: for cancers such as oesophageal, liver, pancreatic, lung, and brain, 5-year survival rates still hover at 30% or lower across Europe.[52] Rare cancers also represent a significant area of unmet need, accounting for 24% of all cancer diagnoses and showing lower five-year survival rates compared to common cancers, at 48.5% versus 63.4%.[53] These figures underscore the urgent need not only for continued scientific progress but also increased investment in the development and delivery of life-saving medicines.

[52] Manzano et al., "Comparator Report on Cancer in Europe 2025," IHE, 2025
[53] Gatta et al., "Burden and Centralised Treatment in Europe of Rare Tumours."

Delays in reimbursement, coupled with insufficient funding, risk stalling progress and denying patients timely access to life-saving treatments

Equally important is ensuring that these treatments, when available, reach the patients who need them. Across Europe, delays and denials in access, driven by lengthy reimbursement procedures, funding constraints, and fragmented decision-making, already contribute to uneven availability of effective cancer therapies.[54] Eastern European countries have the lowest uptake levels of cancer medicines, often below the EU average of 50%, meaning that patients likely receive older, potentially less effective treatments.[55] This may translate to higher premature mortality: for example, the potential years of life lost (PYLL) due to cancer per 100,000 population are significantly higher in some of these countries compared to the EU average of 1,355, reaching 1,777 in Latvia, 1,946 in Romania, and 1,961 in Hungary.[56] Moreover, the median time to reimbursement in the EU for oncology medicines is 540 days as of 2024, a 15% increase since 2022.[57] Without timely reimbursement and sustained funding, even the most promising advances risk remaining inaccessible, perpetuating survival disparities and limiting the potential real-world impact of cancer treatments.

Median time to reimbursement for oncology medicines in the EU

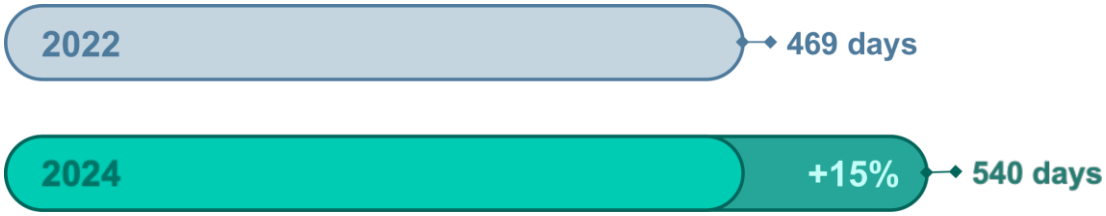

Figure 7. Median time to reimbursement for new oncology medicines has increased 15% since 2022.

Key Insights

- **Cancer complexity:** Cancer includes over 100 distinct types, each with unique biology, progression, and treatment response, making continuous incremental innovation essential to improve patient outcomes and extend lives
- **Survival disparities persist:** Five-year survival rates remain low (30% or less) for cancers such as oesophageal, liver, pancreatic, lung, and brain
- **Rare cancers represent a significant unmet need:** Accounting for 24% of diagnoses, rare cancers have lower 5-year survival rates (48.5%) vs common cancers (63.4%)
- **Access barriers delay patient benefit:** Across Europe, delays and denials due to lengthy reimbursement procedures, with a median of 540 days for oncology medicines in 2024, funding constraints, and fragmented decision-making limit patient access to effective cancer therapies

[54] EFPIA, "The Root Cause of Unavailability and Delay to Innovative Medicines: Reducing the Time before Patients Have Access to Medicines."
[55] Newton et al., "EFPIA Patients W.A.I.T. Indicator 2024 Survey."
[56] OECD and European Commission, *EU Country Cancer Profiles Synthesis Report 2025*.
[57] Newton et al., "EFPIA Patients W.A.I.T. Indicator 2024 Survey"; EFPIA, "EFPIA Patients W.A.I.T. Indicator 2022 Survey."

Cancer care is at a turning point. Breakthroughs are bringing cures within reach and with continued investment, we can ensure the next wave of innovative therapies reaches every patient across Europe

Europe has made strong progress through several policy initiatives, but greater action is needed to fully unlock the potential of cancer innovation

Cancer care stands at a pivotal moment – one marked by both extraordinary promise and pressing urgency. Breakthroughs once considered out of reach are now on the horizon, offering the potential to transform millions of lives. But turning this promise into reality requires wise investment and decisive, coordinated action.

Now is the time to act: sustained funding and supportive policies are essential to turn scientific progress into effective treatments

Initiatives such as Europe's Beating Cancer Plan and EU4Health have laid a strong foundation for progress in cancer care across Europe, by promoting efforts to reduce risk factors, improve early detection, encourage more widespread applications of personalised medicine, and reduce disparities in access to cutting-edge treatments.[58] However, these efforts risk stalling. In the newly announced Multiannual Financial Framework, no dedicated funding has been allocated for health at the EU-level from 2028 onwards, signalling a worrying decline in the prioritisation of health, with negative repercussions likely to follow for cancer.[59] Fully realising the potential of cancer innovation will demand sustained funding, supportive policies, and close collaboration across all sectors – governments, industry, healthcare providers, and patients alike. The next generation of life-saving treatments depends on these collective efforts. More importantly, so do the patients waiting for hope. For them, every moment matters. Delay is not an option.

As the burden of cancer continues to rise, Europe must build on the momentum of these initiatives:

- Maintain commitment to Europe's Beating Cancer Plan beyond 2025 and align with the EU Cancer Mission's ambitious goal to improve the lives of 3 million people by 2030, backed by dedicated EU health funding (such as EU4Health), which is now at risk of being withdrawn
- Strengthen European competitiveness in research and development by ensuring sustained funding and support for innovation, not only to directly benefit patients, but also because supporting the uptake of cancer innovation reinforces the competitiveness of the European life sciences ecosystem on the global stage
- Prioritise addressing patient access by accelerating and ensuring equitable availability of new oncology medicines across Europe

[58] European Commission, "A Cancer Plan for Europe."
[59] Colceriu, "Flash Briefing."

References

Albrecht, Bjorn, Sandra Andersen, Keval Chauhan, Daina Graybosch, and Philippe Menu. "Pursuing Breakthrough in Cancer Drug Development." McKinsey, 2018. https://www.mckinsey.com/industries/life-sciences/our-insights/pursuing-breakthroughs-in-cancer-drug-development.

De Angelis, Roberta De, Elena Demuru, Paolo Baili, et al. "Complete Cancer Prevalence in Europe in 2020 by Disease Duration and Country (EUROCARE-6): A Population-Based Study." The Lancet Oncology 25, no. 3 (2024): 293–307. https://doi.org/10.1016/S1470-2045(23)00646-0.

Bedaso, Asres, Getiye Dejenu, and Bereket Duko. "Depression among Caregivers of Cancer Patients: Updated Systematic Review and Meta-analysis." Psycho-Oncology 31, no. 11 (2022): 1809–20. https://doi.org/10.1002/pon.6045.

Bidard, Francois-Clement, Virginia G. Kaklamani, Patrick Neven, et al. "Elacestrant (Oral Selective Estrogen Receptor Degrader) Versus Standard Endocrine Therapy for Estrogen Receptor–Positive, Human Epidermal Growth Factor Receptor 2–Negative Advanced Breast Cancer: Results From the Randomized Phase III EMERALD Trial." Journal of Clinical Oncology, ahead of print, Wolters Kluwer Health, October 1, 2022. world. https://doi.org/10.1200/JCO.22.00338.

Brinkhuis, Francine, Wim G. Goettsch, Aukje K. Mantel-Teeuwisse, and Lourens T. Bloem. "Added Benefit and Revenues of Oncology Drugs Approved by the European Medicines Agency between 1995 and 2020: Retrospective Cohort Study." BMJ (Clinical Research Ed.) 384 (February 2024): e077391. https://doi.org/10.1136/bmj-2023-077391.

Cardoso, F., S. Paluch-Shimon, E. Senkus, et al. "5th ESO-ESMO International Consensus Guidelines for Advanced Breast Cancer (ABC 5)." Annals of Oncology: Official Journal of the European Society for Medical Oncology 31, no. 12 (2020): 1623–49. https://doi.org/10.1016/j.annonc.2020.09.010.

Caswell-Jin, Jennifer L, Sylvia K Plevritis, Lu Tian, et al. "Change in Survival in Metastatic Breast Cancer with Treatment Advances: Meta-Analysis and Systematic Review." JNCI Cancer Spectrum 2, no. 4 (2018): pky062. https://doi.org/10.1093/jncics/pky062.

CDER. "Novel Drug Approvals for 2024." US Food and Drug Administration, June 4, 2025. https://www.fda.gov/drugs/novel-drug-approvals-fda/novel-drug-approvals-2024.

Chiu, Kevin, Joanna P. MacEwan, Suepattra G. May, et al. "Estimating Productivity Loss from Breast and Non–Small-Cell Lung Cancer among Working-Age Patients and Unpaid Caregivers: A Survey Study Using the Multiplier Method." MDM Policy & Practice 7, no. 2 (2022): 23814683221113846. https://doi.org/10.1177/23814683221113846.

Choi, Horace C. W., Ka-on Lam, Herbert H. M. Pang, Steven K. C. Tsang, Roger K. C. Ngan, and Anne W. M. Lee. "Global Comparison of Cancer Outcomes: Standardization and Correlation with Healthcare Expenditures." BMC Public Health 19, no. 1 (2019): 1065. https://doi.org/10.1186/s12889-019-7384-y.

Chunara, F., C. Hewitt, G. Foxon, and P. Craddy. "HTA122 How Has NICE's Severity Modifier Been Implemented?" Value in Health 26, no. 12 (2023): S342. https://doi.org/10.1016/j.jval.2023.09.1806.

Colceriu, Otilia. "Flash Briefing: European Commission Publishes Proposed New EU Budget 2028-2034." European Cancer Organisation, July 16, 2025. https://www.europeancancer.org/policy/flash-briefing-european-commission-publish-proposed-new-eu-budget-2028-2034.html.

CRUK. "CRUK Analysis Brief: Economic Losses Due to Cancer Mortality." Cancer Research UK, June 2025. https://www.cancerresearchuk.org/sites/default/files/cruk_2025_economic_losses_due_to_cancer_mortality_technical_brief.pdf?_gl=1*1rh3evo*_gcl_au*MTE3ODIyNzgwNC4xNzUyMjIxNDY5*_ga*MTU5N

jkyNzc4Ni4xNzUyMjIxNDY5*_ga_58736Z2GNN*czE3NTIyMjE0NjgkbzEkZzEkdDE3NTIyMjE0OTQkajM0JGwwJGgw.

Dalmartello, M., C. La Vecchia, P. Bertuccio, et al. "European Cancer Mortality Predictions for the Year 2022 with Focus on Ovarian Cancer." Annals of Oncology: Official Journal of the European Society for Medical Oncology 33, no. 3 (2022): 330–39. https://doi.org/10.1016/j.annonc.2021.12.007.

Dyba, T. A., G. Randi, C. Martos, et al. "1501O Long-Term Estimates of Cancer Incidence and Mortality for the EU and EFTA Countries According to Different Demographic Scenarios." Annals of Oncology 32 (September 2021): S1102. https://doi.org/10.1016/j.annonc.2021.08.830.

EFPIA. "EFPIA Patients W.A.I.T. Indicator 2022 Survey." EFPIA, 2023. https://www.efpia.eu/media/s4qf1eqo/efpia_patient_wait_indicator_final_report.pdf

EFPIA. "The Pharmaceutical Industry in Figures." 2024. https://efpia.eu/media/2rxdkn43/the-pharmaceutical-industry-in-figures-2024.pdf.

EFPIA. "The Root Cause of Unavailability and Delay to Innovative Medicines: Reducing the Time before Patients Have Access to Medicines." EFPIA, April 2023. https://www.efpia.eu/media/677292/cra-efpia-root-causes-unavailability-delay-080423-final.pdf.

EMA. "Human Medicines in 2024." European Medicines Agency, January 16, 2025. https://www.ema.europa.eu/en/news/human-medicines-2024.

ESIP, and MEDEV. "Trends in Pharmaceutical Expenditure." ESIP, October 2024. https://esip.eu/publications/health_positions/2024-10_ESIP-MEDEV-Report_Trends-in-Pharmaceutical-Expenditure.pdf.

European Commission. "A Cancer Plan for Europe." European Commission, 2025. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/promoting-our-european-way-life/european-health-union/cancer-plan-europe_en.

Eurostat. "Demography of Europe." May 2024. https://ec.europa.eu/eurostat/web/interactive-publications/demography-2024.

Fowler, Annabelle, Kathleen Grieve, Andreas Maos, and Tim Wilsdon. "Quantifying Public and Private Investment in European Biopharmaceutical Research and Development." Health Affairs Scholar 2, no. 6 (2024): qxae060. https://doi.org/10.1093/haschl/qxae060.

Gatta, Gemma, Riccardo Capocaccia, Laura Botta, et al. "Burden and Centralised Treatment in Europe of Rare Tumours: Results of RARECAREnet—a Population-Based Study." The Lancet Oncology 18, no. 8 (2017): 1022–39. https://doi.org/10.1016/S1470-2045(17)30445-X.

Goddard, Katrina A. B., Eric J. Feuer, Jeanne S. Mandelblatt, et al. "Estimation of Cancer Deaths Averted From Prevention, Screening, and Treatment Efforts, 1975-2020." JAMA Oncology 11, no. 2 (2025): 162–67. https://doi.org/10.1001/jamaoncol.2024.5381.

Harbeck, Nadia, Frédérique Penault-Llorca, Javier Cortes, et al. "Breast Cancer." Nature Reviews Disease Primers 5, no. 1 (2019): 66. https://doi.org/10.1038/s41572-019-0111-2.

Hortobagyi, Gabriel N., Salomon M. Stemmer, Howard A. Burris, et al. "Overall Survival with Ribociclib plus Letrozole in Advanced Breast Cancer." New England Journal of Medicine 386, no. 10 (2022): 942–50. https://doi.org/10.1056/NEJMoa2114663.

IQVIA. "Global Oncology Trends 2024: Outlook to 2028." IQVIA Institute. Accessed July 11, 2025. https://www.iqvia.com/-/media/iqvia/pdfs/institute-reports/global-oncology-trends-2024/iqvia-institute-global-oncology-trends-2024.pdf.

IQVIA Institute. "Global Trends in R&D 2025." March 2025. https://www.iqvia.com/insights/the-iqvia-institute/reports-and-publications/reports/global-trends-in-r-and-d-2025.
Lichtenberg, Frank R. "The Benefits of Pharmaceutical Innovation: Health, Longevity, and Savings." Montreal Economic Institute, 2016. https://www.vises.org.au/documents/2016_Lichtenberg_Benefits_of_Pharma_Innovation.pdf.

Lichtenberg, Frank R. "The Relationship Between Pharmaceutical Innovation and Cancer Mortality in Spain, From 1999 to 2016." Value in Health 26, no. 12 (2023): 1711–20. https://doi.org/10.1016/j.jval.2023.08.011.

Lisy, Karolina, Jared M. Campbell, Catalin Tufanaru, Sandeep Moola, and Craig Lockwood. "The Prevalence of Disability among People with Cancer, Cardiovascular Disease, Chronic Respiratory Disease and/or Diabetes: A Systematic Review." JBI Evidence Implementation 16, no. 3 (2018): 154. https://doi.org/10.1097/XEB.0000000000000138.

Manzano, Andrea, Christer Svedman, Thomas Hofmarcher, and Nils Wilking. "Comparator Report on Cancer in Europe 2025." IHE Report, no. 2 (2025). https://ihe.se/en/rapport/comparator-report-on-cancer-in-europe-2025-disease-burden-costs-and-access-to-medicines-and-molecular-diagnostics-2/.

Modi, Shanu, William Jacot, Toshinari Yamashita, et al. "Trastuzumab Deruxtecan in Previously Treated HER2-Low Advanced Breast Cancer." New England Journal of Medicine 387, no. 1 (2022): 9–20. https://doi.org/10.1056/NEJMoa2203690.

Newton, Max, Kelsey Stoddart, Marco Travaglio, and Per Troein. "EFPIA Patients W.A.I.T. Indicator 2024 Survey." EFPIA, May 2025. https://www.efpia.eu/media/oeganukm/efpia-patients-wait-indicator-2024-final-110425.pdf.

NHS Foundation Trust. "Over Half of Advanced Melanoma Patients Treated with Combination Immunotherapy Drugs Survive the Disease for at Least 10 Years." 2025. https://www.royalmarsden.nhs.uk/news-and-events/news/over-half-advanced-melanoma-patients-treated-combination-immunotherapy-drugs.

NICE. "Assessing Cost Effectiveness." National Institute for Health and Care Excellence, NICE, November 30, 2012. https://www.nice.org.uk/process/pmg6/chapter/assessing-cost-effectiveness.

OECD. Health at a Glance 2023. OECD Publishing, 2023. https://doi.org/10.1787/7a7afb35-en.

OECD. Tackling the Impact of Cancer on Health, the Economy and Society. OECD Health Policy Studies. OECD, 2024. https://doi.org/10.1787/85e7c3ba-en.

OECD and European Commission. EU Country Cancer Profiles Synthesis Report 2025. EU Country Cancer Profiles. OECD Publishing, 2025. https://doi.org/10.1787/20ef03e1-en.

PwC. "Economic Footprint of the Pharmaceutical Industry in Europe." 2024. https://efpia.eu/media/3dqjpl3x/economic-footprint-of-the-pharmaceutical-industry-in-europe-report.pdf.

Roche. "Multiplier Effect: Roche Contributes over 700 Million Euros to GDP and Is a Driving Force for Development, Including Employment, Research, and the Environment." Roche, July 10, 2025. https://www.roche.it/media/comunicati-stampa---news/effetto-moltiplicatore-roche-oltre-700-milioni-di-euro-il-contributo-al-pil-e-motore-di-sviluppo-anche-per-lavoro-ricerca-e-ambiente.

Rosenberg, Philip S., and Adalberto Miranda-Filho. "Cancer Incidence Trends in Successive Social Generations in the US." JAMA Network Open 7, no. 6 (2024): e2415731. https://doi.org/10.1001/jamanetworkopen.2024.15731.

Schurer, Marieke, Suzette M. Matthijsse, Carla Y. Vossen, et al. "Varying Willingness to Pay Based on Severity of Illness: Impact on Health Technology Assessment Outcomes of Inpatient and Outpatient Drug Therapies in The Netherlands." Value in Health 25, no. 1 (2022): 91–103. https://doi.org/10.1016/j.jval.2021.08.003.

Shah, Urvi A., and Sham Mailankody. "Emerging Immunotherapies in Multiple Myeloma." Clinical Review. BMJ 370 (September 2020): m3176. https://doi.org/10.1136/bmj.m3176.

Slamon, Dennis J., Patrick Neven, Stephen Chia, et al. "Overall Survival with Ribociclib plus Fulvestrant in Advanced Breast Cancer." New England Journal of Medicine 382, no. 6 (2020): 514–24. https://doi.org/10.1056/NEJMoa1911149.

Sledge, George W., Masakazu Toi, Patrick Neven, et al. "The Effect of Abemaciclib Plus Fulvestrant on Overall Survival in Hormone Receptor-Positive, ERBB2-Negative Breast Cancer That Progressed on Endocrine Therapy-MONARCH 2: A Randomized Clinical Trial." JAMA Oncology 6, no. 1 (2020): 116–24. https://doi.org/10.1001/jamaoncol.2019.4782.

Snijders, Rolf A. H., Linda Brom, Maurice Theunissen, and Marieke H. J. van den Beuken-van Everdingen. "Update on Prevalence of Pain in Patients with Cancer 2022: A Systematic Literature Review and Meta-Analysis." Cancers 15, no. 3 (2023): 591. https://doi.org/10.3390/cancers15030591.

Vallejo-Torres, Laura, Borja García-Lorenzo, and Pedro Serrano-Aguilar. "Estimating a Cost-Effectiveness Threshold for the Spanish NHS." Health Economics 27, no. 4 (2018): 746–61. https://doi.org/10.1002/hec.3633.

WHO. "Leading Causes of DALYs." World Health Organization, May 2024. https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/global-health-estimates-leading-causes-of-dalys.

WHO. "Leading Causes of Death." World Health Organization, 2024. https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death.

WHO. "Pricing of Cancer Medicines and Its Impacts." World Health Organization, 2018. https://iris.who.int/bitstream/handle/10665/277190/9789241515115-eng.pdf?ua=1.

WHO. "Up to a Quarter of Europeans Will Develop Cancer: From Prevention, Early Diagnosis, Screening and Treatment to Palliative Care, Countries Must Do More." World Health Organization, February 2020. https://www.who.int/europe/news/item/04-02-2020-up-to-a-quarter-of-europeans-will-develop-cancer-from-prevention-early-diagnosis-screening-and-treatment-to-palliative-care-countries-must-do-more.

WifOR Institute. "The Economic Impact of the Global Pharmaceutical Industry." WifOR Institute and IFPMA, November 2024. https://www.wifor.com/en/download/economic-impact-of-the-global-pharmaceutical-industry/.

Wolchok, Jedd D., Vanna Chiarion-Sileni, Piotr Rutkowski, et al. "Final, 10-Year Outcomes with Nivolumab plus Ipilimumab in Advanced Melanoma." The New England Journal of Medicine 392, no. 1 (2025): 11–22. https://doi.org/10.1056/NEJMoa2407417.

Zhao, Jianhui, Liying Xu, Jing Sun, et al. "Global Trends in Incidence, Death, Burden and Risk Factors of Early-Onset Cancer from 1990 to 2019." BMJ Oncology 2, no. 1 (2023). https://doi.org/10.1136/bmjonc-2023-000049.

Zhou, Ting, Haijing Guan, Luying Wang, Yao Zhang, Mingjun Rui, and Aixia Ma. "Health-Related Quality of Life in Patients With Different Diseases Measured With the EQ-5D-5L: A Systematic Review." Frontiers in Public Health 9 (June 2021). https://doi.org/10.3389/fpubh.2021.675523.

Appendix

This appendix outlines the key assumptions and methodologies used in estimating the economic value of cancer innovation for the three metrics: value of health gains attributable to pharmaceutical innovation, jobs created by investment in oncology R&D, and GVA of oncology R&D.

Value of health gains attributable to pharmaceutical innovation in oncology

Assumptions and sources

Potential years of life lost: 1,355 potential years of life lost per 100 000 population in the EU in 2022 and 1,679 in 2012.[60]

Total population of Europe: 445 million.[61]

Average Health-Related Quality of Life (HRQoL) value across cancer types: 0.75.[62]

Percentage of health gains attributable to pharma innovation: 20% and 73%.[63]

Value per QALY:[64]

- £30k, based on the National Institute for Health and Care Excellence cost-effectiveness threshold, conversion: £1 = €1.16
- £50, based on the National Institute for Health and Care Excellence cost-effectiveness threshold for severe diseases, conversion: £1 = €1.16
- €80k, based on the Zorginstituut Nederland cost-effectiveness threshold for severe diseases

Methodology

Life years saved were calculated using the difference in PYLL from 2012 to 2022, expressed per 100,000 population. This was scaled up to the European population by using EU census data.

To convert life years into QALYs, we applied an average HRQoL utility value for cancer.

We multiplied by percentage of the gain attributable to pharmaceutical activity.

We then obtained a range of estimates for the monetary value of the QALYs, based on known willingness to pay thresholds per QALY in Europe (from NICE and ZIN):

[60] OECD and European Commission, *EU Country Cancer Profiles Synthesis Report 2025*.
[61] Eurostat, "Demography of Europe."
[62] Zhou et al., "Health-Related Quality of Life in Patients With Different Diseases Measured With the EQ-5D-5L."
[63] Goddard et al., "Estimation of Cancer Deaths Averted From Prevention, Screening, and Treatment Efforts, 1975-2020"; Lichtenberg, "The Benefits of Pharmaceutical Innovation: Health, Longevity, and Savings."
[64] Schurer et al., "Varying Willingness to Pay Based on Severity of Illness"; NICE, "Assessing Cost Effectiveness"; Chunara et al., "HTA122 How Has NICE's Severity Modifier Been Implemented?"

Value of Cancer Health Gains Attributable to Pharmaceutical Innovation (€ billions)

		Value per QALY		
		Low (€34.8k)[1]	Medium (€58k)[2]	High (€80k)[3]
Percentage of health gains attributable to pharmaceutical innovation	20%	€7.5	€12.6	€17.3
	46.5%	**€17.5**	**€29.2** (Median value)	**€40.3**
	73%	€27.5	€45.9	€63.3

[1]Based on the National Institute for Health and Care Excellence cost-effectiveness threshold, conversion: £1 = €1.16
[2]Based on the National Institute for Health and Care Excellence cost-effectiveness threshold for severe diseases, conversion: £1 = €1.16
[3]Based on the Zorginstituut Nederland cost-effectiveness threshold for severe diseases

Limitations
Our calculations rely on aggregate-level, publicly available data, which are difficult to collect and may mask disparities across regions. Due to a lack of data, estimates for PYLL rely on static snapshots of 2012 and 2022, rather than continuous trend analysis, potentially oversimplifying complex epidemiological dynamics. Furthermore, applying a single value for HRQoL does not account for substantial variations in patient experiences that exist in reality, and may lead to underestimation of overestimation of QALYs gained. Lastly, our chosen monetary values per QALY may not reflect societal willingness-to-pay in all European countries, as not all countries publicize their QALY thresholds, make decisions based on QALYs, or have comparable economic situations to those represented in our analysis.

Jobs created by investment in oncology R&D

Assumptions
Workers employed in pharmaceutical R&D: 123,000 in 2022.[65]

Share of R&D dedicated to oncology: 40%, based on the number of product-indication pairs in development dedicated to cancer.[66]

Methodology
We multiplied the total number of staff employed in R&D by the share of R&D dedicated to oncology.

Limitations
This estimate assumes that a static percentage of R&D is dedicated to oncology across all companies and geographies and only captures direct employment, not considering indirect jobs or induced employment resulting from economic spillovers.

Gross value added from oncology R&D

GVA represents the industry's economic output calculated as the value of goods and services produced, minus the cost of inputs.

[65] EFPIA, "The Pharmaceutical Industry in Figures."
[66] Albrecht et al., "Pursuing Breakthrough in Cancer Drug Development."

Assumptions
Total pharmaceutical GVA in Europe: €447.6 billion in 2022.[67]

Proportion of GVA attributed to R&D: 30% of pharmaceutical industry's contribution comes from R&D activities.[68]

Share of R&D dedicated to oncology: 40%, based on the number of product-indication pairs in development dedicated to cancer.[69]

Methodology
The proportion of GVA attributed to R&D and the share of R&D dedicated to oncology were multiplied by the total pharmaceutical GVA in Europe.

Limitations
Proportions reflect averages that may not be applicable across all countries or companies.

[67] PwC, "Economic Footprint of the Pharmaceutical Industry in Europe."
[68] WifOR Institute, "The Economic Impact of the Global Pharmaceutical Industry."
[69] Albrecht et al., "Pursuing Breakthrough in Cancer Drug Development."