european cancer ORGANISATION

REACH HIGHER FOR CANCER CARE

Investing for High Returns:
The Case for Sustained Commitment to Cancer Control

An ECO Policy Research Study



Acknowledgements

This policy research study forms part of the Reach Higher for Cancer Care campaign, an advocacy initiative of the European Cancer Organisation to ensure that cancer remains a political and financial priority in the EU's next long-term budget for 2028 to 2034.[a]

It draws on evidence gathered from across the cancer research and policy literature. We thank all partners who contributed to this effort, providing input and references to support the case for continued investment in cancer control.

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Suggested citation

Seddiki S, Traiteur N. (2026). Investing for High Returns: The Case for Sustained Commitment to Cancer Control. European Cancer Organisation; Brussels.

a Find more information on the campaign here: https://www.europeancancer.org/campaign/reach-higher-for-cancer-care

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Executive summary

Cancer takes a vast and growing toll on Europe. Each year, around 4.3 million people are diagnosed with cancer and close to 2 million die from it. Among people under 65 in the EU, cancer is already the leading cause of death, and it is on course to become the leading cause overall by 2035. In 2023, cancer cost €228 billion across 31 European countries, through healthcare spending and lost productivity. On top of that, families provided €26 billion in unpaid care. Much of this burden is avoidable. Around 40% of all cancers are preventable, and raising survival in 15 countries to Sweden's level would avoid almost 200,000 deaths a year.

Closing that gap requires effective cancer control interventions throughout the whole pathway, from prevention and early detection through diagnosis, treatment and survivorship. It also depends on research, infrastructure, workforce and action on inequalities, which together make the pathway work for everyone. Because cancer control relies on the wider health system, investing in it strengthens that system too.

Europe has started to act on this. Europe's Beating Cancer Plan and the EU Cancer Mission have mobilised Member States and prompted a wave of new national cancer plans. That momentum is now at risk. The proposed 2028 to 2034 Multiannual Financial Framework (MFF) would end EU4Health and leave health without a ring-fenced budget. With cancer control competing for scarce resources, it needs to be recognised for what it is: an investment that pays back.

This study brings together the European evidence across nine areas of cancer control. In every one of them, action generates measurable returns:

- **Prevention:** If every country reached the best risk factor levels already seen in the region, 300,000 cancers would be prevented and €61 billion in healthcare costs saved every year, for cancer and related diseases. Lithuania's alcohol tax increase returned €420 for every €1 spent implementing it.
- **Early detection:** In France, Germany, Italy and Spain, wider and better-attended breast cancer screening would save 3,200 lives a year.
- **Diagnosis:** Treating cancer diagnosed early costs 2 to 4 times less than treating advanced disease. In England, introducing liquid biopsy for lung cancer diagnosis delivered results two weeks faster, with benefits exceeding costs, and is now national practice.
- **Treatment and care:** In Germany, treating every patient in a certified cancer centre could avoid 4,729 deaths a year. For colon cancer, certified centres delivered better survival at lower cost.
- **Survivorship:** A Dutch return-to-work programme would generate €92 million a year in productivity gains for €15.4 million in costs.
- **Research and innovation:** Cancer research has generated 5.9 million quality-adjusted life years (QALYs) in the UK, worth a net £124 billion, and UK investment in it returns around 40% a year. Meeting the EU target of 11% more clinical trials would add around €4 billion a year to the economy and 18,000 jobs, across all therapeutic areas.
- **Infrastructure:** France's national sarcoma network corrected one in seven diagnoses, lowered costs per patient and reduced the risk of death at one year by 24%.
- **Workforce:** Extending one-to-one support to every cancer patient in England would cost around £70 million a year and bring £89 million in NHS benefits.
- **Inequalities:** If people with lower education had the same cancer mortality as the most educated, 32% of cancer deaths in men and 16% in women would be avoided. Halving health inequalities overall would bring benefits worth up to 4.3% of GDP.

The case for investment is clear, but returns like these do not appear on their own. They come from sustained, predictable funding that turns pilots into national practice. Many of the EU cancer policy's actions run to 2030, and their targets run to 2040, beyond the current budget. A ring-fenced health programme in the EU's next MFF would protect what Europe has already built. Scaling back now would give up returns that are already within reach.

Introduction

Cancer remains one of the greatest health, social, and economic challenges facing Europe today. Despite decades of progress in prevention, detection, treatment and follow-up care, it continues to place an immense burden on societies and economies across the region. As populations age, more and more people are projected to be diagnosed with cancer, creating increased pressures on an already overstretched health workforce. Meanwhile, the continuous improvements in cancer survival rates create new demands for health systems to support patients living with and beyond the disease.

At the same time, cancer control has received increasing policy attention throughout Europe in recent years. Initiatives such as Europe's Beating Cancer Plan and the EU Mission on Cancer, alongside a wave of national cancer plans and strategies, reflect a growing political commitment to addressing the burden of cancer through comprehensive and sustained action. This momentum now sits, however, at a critical juncture, as discussions on the EU's next long-term budget as well as competing policy priorities will shape the resources available for cancer control for years to come.

In a context of poly-crisis and competing priorities, continued action against cancer in Europe cannot be taken for granted; it requires clear demonstrations of the impact achieved from the past and ongoing cancer control initiatives. This means treating cancer control not as a cost to be managed or contained, but as an investment producing measurable value. Such value can take several forms: human, through reduced mortality and morbidity, and improved quality of life for patients and their families, but also economic, through avoided care costs and preserved workforce productivity.

Against this background, the present study sets out to document the case for investment in cancer control by:

- Establishing the scale of the challenge posed by cancer to Europe, in terms of human and economic toll, interventions required, and broader policy and health system contexts
- Presenting evidence of returns from investments made across nine areas of cancer control, drawing on available data and, where possible, concrete case studies to illustrate both the need for action in that area and the value that action has been shown to deliver in practice

Taken together, these sections aim to give policymakers and stakeholders a clear, evidence-based rationale for prioritising cancer control investment, not as an isolated public health concern, but as a strategic economic and societal investment.

Acting against cancer: The scale of the challenge

Cancer in Europe: A growing burden

The human cost of cancer

Cancer is among the leading causes of death and morbidity in Europe. Across Europe, there are an estimated 4.3 million new cancer cases and close to 2 million cancer deaths each year.[1] In the EU, there were an estimated 2.7 million new cancer cases and 1.3 million cancer deaths in 2024, the equivalent of five new diagnoses and more than two deaths every minute.[2] Cancer is the second leading cause of death after cardiovascular disease,[3] and without decisive action it is set to become the leading cause by 2035.[4] Over a lifetime, almost one in two men and more than one in three women in the EU are expected to be diagnosed with cancer before age 85. Among people under 65, cancer is already the leading cause of death, accounting for 32% of all deaths in this age group.[5]

The burden is growing. Cancer incidence in Europe rose by nearly 60%, between 1995 and 2022, from 2.1 million to 3.2 million, driven mainly by population ageing.[5] In the EU, new cases are projected to rise by a further 18% by 2040, with the steepest increases expected in Luxembourg, Ireland, and Malta.[3] Without further progress, Europe will face 4.1 million new cancer cases and 2.1 million cancer deaths every year by 2050.[5]

Cancer mortality varies widely across Europe. The average age-standardised cancer mortality rate in the EU is 235 per 100,000 population, ranging from around 200 in Malta and Luxembourg to around 310 in Hungary and Croatia.[3] These gaps partly reflect differences in survival, which remain wide across Europe. Because survival captures how early cancer is detected and how effectively it is treated, it is widely used as a measure of health system quality. Raising survival in 15 European countries to the level of Sweden, Europe's best performer, could avoid almost 200,000 cancer deaths every year.[5] Differences in cancer mortality across Europe are therefore, to a significant degree, differences in access to timely, high-quality care.



Behind the incidence and mortality figures are millions of people living with the effects of cancer. As survival improves, the number of cancer survivors in Europe has grown to an estimated 23.7 million.[6] Many carry a substantial burden of disability and reduced quality of life. Cancer accounted for 17% of all disability-adjusted life years (DALYs) in Europe in 2021, tied with cardiovascular disease as the leading driver of disease burden.[5] On average, it reduces healthy life expectancy in the EU by 1.6 years, through symptoms such as fatigue, pain and nausea, and causes an estimated 85,000 additional cases of depression each year.[3] Surviving cancer is increasingly common in Europe, but surviving well is not yet guaranteed.

The economic cost of cancer

Understanding the economic toll of cancer

Cancer is often discussed as a cost to health systems, yet health spending captures only part of its economic impact. The disease also removes people from the workforce, reduces economic output and shifts a considerable financial burden onto patients and those who care for them. Assessing the true economic toll of cancer therefore means accounting for three distinct components.[5,7,8]

- **Direct healthcare costs:** the resources health systems spend on diagnosing, treating and caring for people with cancer. This covers hospital, outpatient, primary and emergency care, medicines, and palliative care.
- **Indirect (productivity) costs:** the economic output lost when people with cancer die before reaching retirement age, take time off work, leave the labour market early, or continue working at reduced capacity.
- **Societal costs beyond healthcare:** the income losses and out-of-pocket expenses patients face as a result of their illness, together with the unpaid care provided by relatives and friends (informal caregiving).

Putting a figure on these costs is not straightforward, and the estimate depends heavily on the method used. At the European level, the economic toll of cancer is quantified in two main ways:

- **Cost-of-illness studies** add up actual spending on cancer care, drawn from national health expenditure data and cancer drug sales data, and then put a value on output lost to premature death and illness.[5,8]
- **Microsimulation modelling,** such as that used by the OECD, compares a projected scenario with cancer against a hypothetical one in which cancer does not exist. Because this method accounts for population dynamics and the costs of other diseases, it isolates the share of spending genuinely attributable to cancer and allows projections to 2050.[9]

The two approaches are not directly comparable, and three differences should be kept in mind when reading the figures that follow. The first is geographical scope: cost-of-illness estimates cover 31 European countries, including Switzerland and the United Kingdom, whereas the OECD modelling is limited to the EU27, Iceland and Norway. The second, and most significant, concerns what each method measures. Cost-of-illness studies account for all spending on cancer care and all output lost to the disease, while the modelling isolates only the additional costs that would not arise in a world without cancer. Finally, the two refer to different time frames, one describing a single observed year and the other an annual average projected to 2050. Modelling estimates are therefore generally lower. Both approaches nonetheless lead to the same conclusion: the economic burden of cancer in Europe is vast, and it extends far beyond the health sector.

The scale of the burden today

Based on cost-of-illness estimates, the total economic burden of cancer reached €228 billion in 2023 across 31 European countries: the EU 27, Iceland, Norway, Switzerland and the United Kingdom. This figure combines spending on cancer care with productivity losses, and represents a 43% increase in real terms since 1995.[5]

Microsimulation modelling covering the same two components puts the burden at close to €150 billion a year on average up to 2050.[10] Of this, around €97 billion falls on health systems and about €50 billion comes from lost workforce productivity.

The sections below break this burden down into its three components.

Direct healthcare costs

Direct healthcare costs cover all spending on cancer care across the whole cancer pathway.[5] This spending is delivered through hospital inpatient and outpatient services, primary and emergency care, and medicines.[7,11]

Both methods of quantification point to a substantial cost. Based on cost-of-illness estimates, €146 billion was spent on cancer care in 2023 across 31 European countries. On average, cancer accounts for 6.6% of health expenditure in these countries.[5] Modelling estimates project that cancer will cost health systems in the EU27, Iceland and Norway around €97 billion a year on average up to 2050, raising health expenditure by 5% compared with a scenario without cancer.[10]

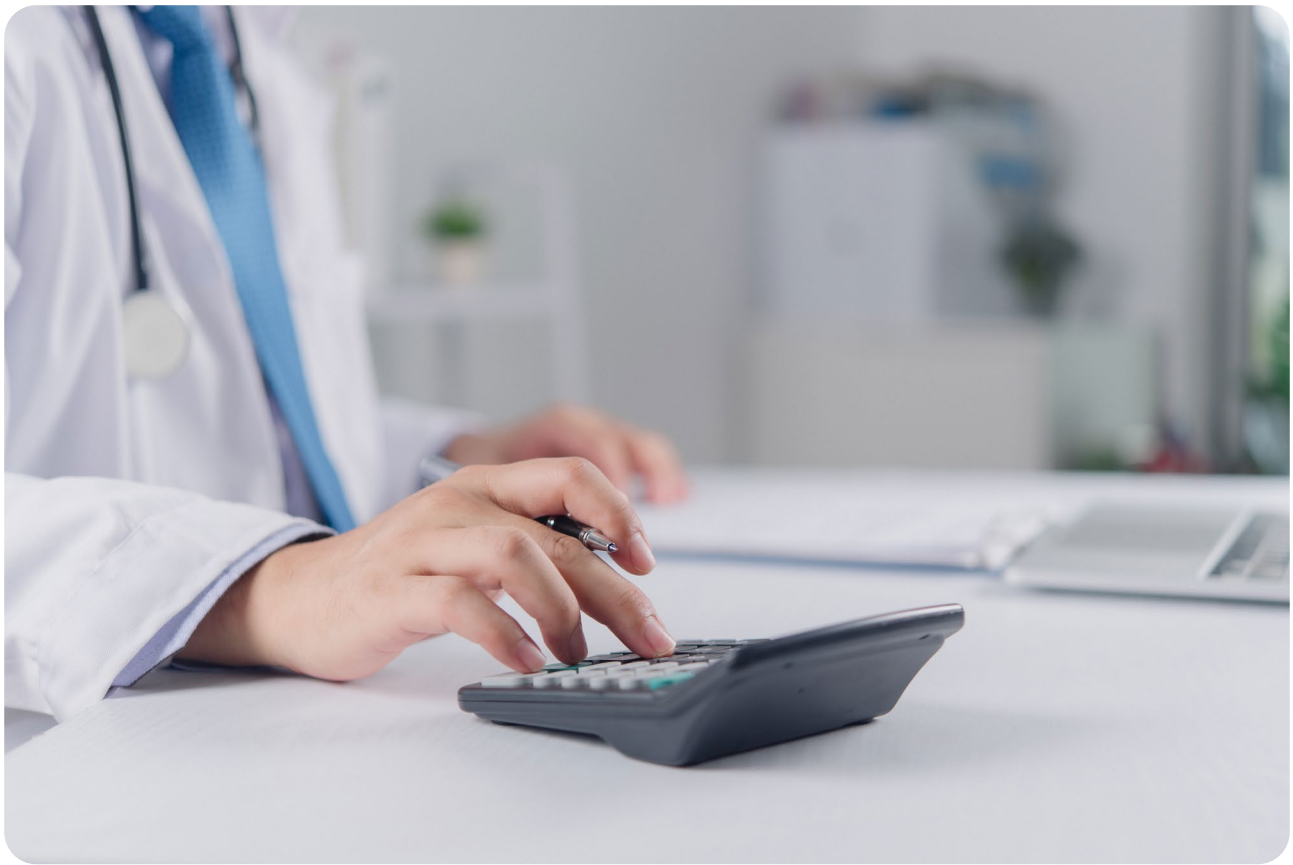
These costs have grown steadily and will continue to do so. Spending on cancer care rose by 135% in real terms between 1995 and 2023, while cancer's share of total health expenditure remained broadly stable.[5] Looking ahead, population ageing alone is expected to push real per-capita cancer spending in the EU27 up by 59% by 2050.[12] Without action across the cancer pathway, the cost of cancer to health systems will keep rising. Spending also varies widely between countries, from below €150 per person in some Central and Eastern European countries to more than €400 in Germany and Switzerland.[5]

The way this money is spent has also changed. Medicines grew from 17% of direct costs in 2008 to 31% in 2018.[13] Over the same period, the share going to inpatient hospital care declined, as fewer admissions and shorter stays offset part of the rise in medicines spending.[5,13]

Indirect productivity costs

Indirect costs capture the productivity lost to the economy when people of working age die prematurely from cancer or are unable to work because of their illness through sick leave or early retirement.[5]

Both methods of quantification show a substantial loss. Based on cost-of-illness estimates, indirect costs amounted to €82 billion in 2023 across 31 European countries.[5] Modelling estimates project that cancer will reduce workforce productivity in



the EU27, Iceland and Norway by about €50 billion a year on average up to 2050,[10] the equivalent of the EU losing 1.1 million full-time workers.[9] This driver is not set to fade quickly. Projections put the paid work lost to premature cancer deaths at €1.3 trillion between 2018 and 2040, or around €59 billion a year, with only a 6% decline expected over the period. Lung and colorectal cancer account for the largest losses.[14]

Unlike direct healthcare costs, indirect costs have fallen over time, declining by 16% in real terms between 1995 and 2023. The entire decline came from fewer people of working age dying from cancer: losses linked to illness, through sick leave and early retirement, remained steady at €24–25 billion a year throughout the period. Premature death nonetheless remains the largest driver of cancer's toll on the workforce.[5]

These figures are likely to understate the true loss, for two reasons. First, because they cover only premature death, sick leave and early retirement,[5] they leave out presenteeism, the reduced productivity of people who keep working while ill or recovering from treatment. Second, they count only paid work. When unpaid work such as housework, caring and volunteering is also valued, losses from premature cancer deaths alone reached €104.6 billion in 2018, almost half of it from unpaid work.[15]

Societal costs beyond healthcare

Societal costs beyond healthcare include those borne by patients themselves as a result of their disease and treatment, such as lost income and out-of-pocket payments for care, travel and other treatment-related expenses. They also include costs borne by the relatives and friends who look after them, through informal caregiving: unpaid help with household tasks, medical care and emotional support.[16] These financial impacts on patients and carers are collectively described as the financial toxicity of cancer, a term that covers both the financial burden itself and the distress it causes.[17]

Informal caregiving is the largest and least visible of these costs, and unlike direct and indirect costs, it is not tracked regularly. The most recent pan-European estimate valued it at €26 billion in 2018,[8] a cost that comes on top of the €228 billion total presented above.

For patients, the financial consequences are widespread, even in countries with universal health coverage. In a survey of 2,507 patients across Europe, 56% reported income loss, 86% reported additional treatment related expenses, and 16% delayed or avoided care because of cost.[18]

Acting against cancer: A multi-dimensional commitment

The scale of the cancer burden requires coordinated action across the whole course of the disease, and the systems, people, and inequities that determine who benefits.

There is no single agreed framework for cancer control action. Definitions differ in how they divide the pathway and which enabling areas they single out, but most combine stages of care with action at every level of the health system and beyond.[19,20,21] The present study follows the WHO definition, under which cancer control aims to reduce cancer incidence and mortality and improve quality of life through the systematic and equitable implementation of evidence-based strategies for prevention, early detection, diagnosis, treatment and palliation.[19] To structure this action, it builds on the framework of Europe's Beating Cancer Plan,[4] adapted into nine areas:

Cancer control action is therefore understood along two dimensions:

- **The cancer pathway:** prevention, early detection, diagnosis, treatment and care, and survivorship and quality of life. These follow the Plan's four action areas, with diagnosis and treatment treated separately.
- **Cross-cutting actions** which span every stage of that pathway and shape how effectively it functions as a whole: research and innovation, infrastructure, workforce, and inequalities.

The cancer pathway

The cancer pathway is typically broken down into five stages:

- **Prevention:** action taken before cancer develops, including reducing exposure to known risk factors such as tobacco, alcohol, nutrition, environmental factors and cancer-causing infections.
- **Early detection:** identifying cancer at an early stage, either before the onset of symptoms (through screening) or as quickly as possible after they appear (through early diagnosis).
- **Diagnosis:** the clinical pathway from initial investigation to confirmed diagnosis. This includes staging and characterisation of the tumour: what type of cancer it is, established through pathology, traditionally histology and increasingly molecular and biomarker testing.
- **Treatment and care:** the full range of clinical interventions once cancer is diagnosed, including medicines, surgery and radiation therapy, as well as the provision of multidisciplinary integrated cancer care.
- **Survivorship and quality of life:** the period following active treatment, including follow-up care, management of late effects, psychosocial support, rehabilitation and palliative care.

Each stage is connected to the others, in both directions. Weak early detection leads to later-stage diagnoses and worse treatment outcomes. Gaps in survivorship support can erode the value of treatment that was otherwise successful. Investment across the pathway therefore needs to be planned as a connected whole, not as a set of isolated priorities.

Cross-cutting actions

Alongside the pathway, cross-cutting areas of action determine whether interventions at each stage can be delivered effectively, sustainably, and equitably. A country can have well-designed screening guidelines or treatment protocols on paper and still fail to deliver good outcomes if these enablers are weak. Classifications vary;[4,22,23] the areas retained in this paper include:

- **Research and innovation:** generating new knowledge and translating it into better outcomes across the pathway. This spans basic and translational research, clinical trials and implementation research, personalised medicine including genomics and biomarkers, and the systems needed to bring proven innovations into routine practice at scale.[4,24] Data and digital technologies, such as artificial intelligence applied to cancer imaging and clinical data, are increasingly central to this work.[25] Research and innovation is what allows every other area of cancer control to keep improving.
- **Infrastructure:** the organisations, equipment and data systems that cancer care depends on. This includes comprehensive cancer centres and cancer care networks that bring together care, research and education,[26] with an EU goal that 90% of eligible patients have access to a comprehensive cancer centre by 2030.[4] It also covers diagnostic and treatment equipment such as imaging, pathology and radiotherapy, and digital health tools. Cancer registries and data systems tracking incidence, treatment and outcomes are equally essential: linked to screening and socioeconomic data, they allow policymakers to see where systems underperform and whether interventions work.[27] Much of this requires major upfront investment and long planning horizons, so gaps are slow to close.
- **Workforce:** the health professionals who deliver cancer care at every stage of the pathway. Quality cancer care depends on multidisciplinary teams and on close collaboration between professionals across disciplines, including primary care.[28] Capacity also depends on how professionals are distributed geographically, on specialised skills keeping pace with evolving care, and on investment in training. Over three-quarters of EU+2 countries report workforce shortages in cancer care and across the health sector, with general practitioners and nurses particularly affected.[27,29] Without the staff to deliver care, even well-funded infrastructure and treatments cannot benefit patients.

- **Inequalities:** systematic differences in cancer outcomes between population groups, whether by age, sex, socioeconomic status, geography, or other factors. These can arise at any stage of the pathway and are often deepened by gaps in the other cross-cutting areas, which tend to fall hardest on already disadvantaged groups.[27] Inequalities are therefore treated as a distinct area of action, not a side effect of pathway-level interventions.

Together, these nine areas structure the return on investment evidence presented in this study.

Cancer control as a health system investment

Cancer control does not operate in isolation. It depends on, and in turn shapes, the broader health system within which it sits.

The Health System Performance Assessment framework describes health systems through four core functions: governance, resource generation (covering the health workforce, infrastructure and medical products), financing, and service delivery.[30] Each of these functions is directly relevant to cancer control, and weaknesses in any one of them tend to constrain what can be achieved even where cancer-specific policy is well designed.

This relationship runs in both directions. On one hand, the strength of the underlying health system determines how effectively cancer control interventions can be delivered. A country with strong primary care can identify symptomatic patients earlier and refer them appropriately.[31] A country with a well-functioning health information system can track screening uptake, treatment outcomes, and survival over time, and use that data to improve services.[32] A country with adequate health financing arrangements can shield patients from financial toxicity, rather than leaving cancer care dependent on out-of-pocket payment. Where these underlying system capacities are weak, cancer-specific investment is likely to deliver lower returns than it would in a stronger system, since the surrounding infrastructure needed to translate policy into outcomes is missing.

On the other hand, investment in cancer control often strengthens the broader health system in return.[33,34] Diagnostic imaging capacity built for cancer detection can also support the diagnosis of cardiovascular disease and other conditions.[35] Investment in oncology workforce training can also build clinical and managerial skills that are transferable to the wider health workforce. Cancer registries, among the most developed disease specific data systems in many countries, have



often served as models or foundations for broader health information system development.[34] In this sense, cancer control investment can generate spillover benefits well beyond cancer outcomes alone, strengthening system resilience and capacity to respond to other health challenges, including future pandemics or the rising burden of other noncommunicable diseases.

This systems view also matters for how cancer control is positioned within health policy more broadly. Cancer sits within the wider noncommunicable disease agenda, alongside cardiovascular disease, diabetes, and chronic respiratory disease, all of which share overlapping risk factors and can benefit from shared prevention efforts.[36] It also sits within the broader movement towards universal health coverage, which aims to ensure that all people can access the health services they need without suffering financial hardship. Framing cancer control as part of the larger health system, rather than as a standalone vertical programme, is of increasing importance in maximising returns on public spending: both for efficiency, since it avoids duplicating infrastructure and workforce investment across disease areas, and for equity, since a fragmented approach tends to leave the same underserved populations behind across multiple conditions at once.[37]

Cancer policy today in Europe

Cancer has occupied a prominent place on national and European health policy agendas over the past few years, reflecting the scale of the burden set out earlier in this study. At the national level, a growing number of countries have been developing and implementing dedicated cancer control plans.[38] Complementing these national efforts, and building on previous programmes, the European Union launched in 2021 two new frameworks to tackle cancer at the highest level of European policy-making:

- **Europe's Beating Cancer Plan,** with an initial budget of €4 billion from the 2021 to 2027 MFF. It covers the whole cancer pathway through 42 actions, including 10 flagship initiatives, and three cross-cutting themes: new technologies, cancer inequalities and childhood cancer.[4]
- **The EU Mission on Cancer,** launched under Horizon Europe, which aims to improve the lives of more than 3 million people by 2030. Co-developed with the Plan under joint governance, the Mission acts as its research and innovation engine, while the Plan supports implementation of its solutions across Member States.[24]

Since 2021, a wide range of concrete actions have followed,[39] spanning legislation, policy guidance, EU-level infrastructure and research funding, including:

- EU legislative developments to limit exposure to cancer risk factors, such as tobacco, air pollution and workplace carcinogens[40]
- New advice to EU Member States through Council Recommendations on cancer screening, vaccine-preventable cancers and smoke- and aerosol-free environments, as well as a range of EU Joint Actions, policy implementation pilot projects and quality assurance initiatives
- Establishment or consolidation of EU systems for cancer control, through the new Knowledge Centre on Cancer
- Development of new digital tools, programmes and networks supporting patient access to care, cancer professionals' training and pan-European collaboration in cancer care, research and policy
- Support to research and innovation projects advancing understanding and opportunities across the whole cancer pathway

Formal reviews of the Plan and the Mission paint an overall positive picture. Over 90% of the Plan's actions had been concluded or were ongoing by the end of 2024.[39] The European Court of Auditors, in its 2026 audit of the Plan, found that it is contributing to the coordination of Member States' efforts against cancer, that all flagship initiatives were launched on schedule, and that more than €2.7 billion of its €4 billion budget had been committed by October 2025. The Plan has also acted as a catalyst for national action, with four Member States adopting new cancer plans and ten updating existing ones since its launch.[41] The Mission's recent mid-term assessment is similarly encouraging, finding it on track to exceed its goal of improving the lives of more than three million people by 2030.[42]

These reviews also make clear that much of the change must ultimately happen at national level. EU recommendations, pilots and networks only deliver lasting results when Member States take them up and fund them, and implementation remains uneven across countries.[43] The Court found useful EU-funded projects that were never taken up nationally, and noted that the future of key initiatives, such as the European network of comprehensive cancer centres, depends on uncertain national follow-up and funding. Participation in EU cancer action is also unequal: EU funding under the Plan does not proportionally target the countries with the highest cancer burden, which risks widening existing disparities. Countries with more limited administrative and research capacity, particularly in Central and Eastern Europe, also face greater barriers to taking part in EU cancer initiatives.[41]

Fragmentation, short-term funding cycles and uncertain sustainability are a serious threat to the long-term impact of EU cancer action.[44] The Court concluded that the Plan's effectiveness risks being compromised by overlapping initiatives, the lack of a framework to assess impact, sustainability concerns and an unclear outlook after 2027. It warned that, without long-term plans, EU-funded projects risk remaining isolated pilots with limited impact. The Mission's assessment likewise stresses that continued investment is needed to scale up its results. With many of the Plan's actions running to 2030 and its targets to 2040, well beyond the current budget period, sustained EU-level action on cancer remains essential.

Much of this progress was enabled by dedicated EU funding. EU4Health, the EU's health programme for 2021 to 2027, earmarked €1.25 billion for the Plan's actions, while Horizon Europe earmarked up to €2 billion for cancer research and innovation, including dedicated funding for the Cancer Mission.[39] This dedicated funding is now at risk under the next MFF.

The European Commission presented its proposal for the 2028 to 2034 MFF in July 2025, setting out a budget of almost €2 trillion.[45,b] Under this proposal, EU4Health, the EU's standalone health programme would cease to exist after 2027.

Instead, health funding would now be folded into a new European Competitiveness Fund (ECF), which merges 14 existing programmes into four broad policy windows. Health would share one of these windows with biotechnology, agriculture and the bioeconomy, worth around €22.6 billion in total, with no amount ringfenced for health.[46,47]

The same applies to research, with Horizon Europe's successor also tied into the ECF architecture, and its proposed structure containing no cancer-specific component, implying the EU Cancer Mission would have no successor after 2030. The loss goes beyond money. Without a dedicated programme, health would also lose its own governance: no health-specific work programme, no dedicated committee in which Member States' health ministries oversee spending, and no measurable health objectives against which results can be judged. Health priorities would have to compete with industrial and agricultural interests for the same funds, under decision-making structures built around competitiveness rather than public health.

With no ring-fenced health envelope, no dedicated health governance and no clear path for financing Europe's Beating Cancer Plan or the EU Cancer Mission beyond the current MFF, the proposal risks deprioritising health and leaves the future of EU cancer action deeply uncertain.

The case for investment

The preceding sections have set out the scale of the challenge. Cancer places an immense and growing human and economic burden on individuals and health systems across Europe. Addressing it requires coordinated action across the full cancer pathway, underpinned by strong infrastructure, an adequate workforce, sustained research and innovation, and a deliberate focus on closing inequalities. This action both depends on and strengthens the wider health systems in

b The figure of almost €2 trillion (€1,984 billion) is in current prices, also called nominal terms, and includes a 2% annual inflation adjustment. Some sources instead give €1.76 trillion, which is the same budget expressed in constant 2025 prices.

which cancer control sits. It is also unfolding at a time of real political momentum, but with genuine uncertainty over how the EU's next long-term budget will treat health.

This creates both an obligation and an opportunity. The obligation follows from the scale of the burden: a disease that costs Europe up to €228 billion a year and claims nearly two million lives annually cannot responsibly be deprioritised. The opportunity lies in timing. Decisions taken on the EU's next MFF will determine the resources available for cancer control for years to come.

This paper argues that the strongest response to that uncertainty is evidence. Investment decisions of this scale are rarely made on the basis of need alone; they are made, or at least justified, on the basis of expected returns. On this point, the evidence base is increasingly clear. Across the cancer pathway and its cross-cutting enablers, a growing body of research shows that well-designed interventions do not simply cost money, they generate value, both in economic and human terms.

The remainder of this paper sets out that evidence in detail. The following section examines the return on investment across nine areas of cancer control: prevention, early detection, diagnosis, treatment and care, survivorship and quality of life, research and innovation, infrastructure, workforce, and inequalities. Each section follows the same structure:

- The policy needs and types of interventions available
- The evidence on the economic and human value these interventions generate
- Case studies illustrating that value in practice

The aim is not merely to describe what is being done against cancer in Europe today, but to make a clear, evidence-based case for why doing more, and doing it now, represents sound investment rather than simply necessary spending.

Key considerations when interpreting evidence on returns

Evidence on the economic and human returns of cancer interventions is a powerful argument for investment, but it needs careful interpretation. In assessing the evidence in this paper, the following questions were considered:

- **Opportunity cost:** How would the intervention affect other cancer control actions?
- **System effects:** How would the intervention affect other parts of the health system?
- **Equity:** Who benefits? Does the intervention reduce inequalities, or risk widening them?
- **Time horizon:** Are the benefits measured over the short or long term? Many cancer interventions only pay off over years or decades.
- **Implementation feasibility:** Can the intervention realistically be delivered with current health system infrastructure, workforce and funding?
- **Perspective:** Which costs and benefits are counted? Results look different from a health system, government or wider societal perspective.
- **Transferability:** Would results from one country or setting hold in another, given differences between health systems?
- **Strength of evidence:** How robust or uncertain are the estimates, and are they based on modelled projections or observed outcomes?

Evidence on returns from cancer interventions

Cancer prevention

Policy needs and interventions

Prevention is where the cancer pathway begins, and it is also where Europe's investment gap is widest relative to the size of the opportunity. Around 40% of cancer cases diagnosed in the EU are estimated to be preventable.[10] Lung cancer alone accounts for 18% of all preventable deaths in the EU, more than any other cause. Stomach and liver cancer add a further 3% each. Despite this, only about 4% of total EU health spending was allocated to prevention in 2023.[48]

The policy interventions needed are well established and recognised in European and international recommendations:[49,50]

- **Tobacco control:** higher taxes, bans on advertising and promotion, plain packaging with graphic warnings, smoke-free environments, cessation support, and extending these rules to e-cigarettes and novel nicotine products.
- **Alcohol control:** higher taxes and minimum pricing, limits on availability, marketing restrictions, and health warning labels.
- **Healthy diets and obesity prevention:** taxes on unhealthy food and sugary drinks, reformulation, front-of-pack labelling, healthy public food procurement, and restrictions on food marketing to children.
- **Physical activity:** population-wide campaigns, active travel infrastructure, and physical activity in schools, workplaces and primary care.
- **Breastfeeding:** regulation of breast-milk substitute marketing, adequate parental leave, and support in the workplace.
- **Cancer-causing infections:** Human Papillomavirus (HPV) vaccination for girls and boys, hepatitis B immunisation, and test-and-treat programmes for hepatitis B and C, HIV and *H. pylori*.
- **Environmental and occupational exposures:** enforcement of limits on workplace carcinogens, cleaner air in line with WHO guidelines, radon testing and remediation, and UV protection, including sunbed restrictions.

Almost none of these interventions require new clinical infrastructure or workforce capacity to deliver at scale. Taxation, regulation, vaccination programmes delivered through existing school and primary care systems, and public information campaigns are comparatively inexpensive to implement relative to the care costs they avert later in the pathway. This is why prevention ranks among the most cost-effective forms of health spending, and why the evidence on returns reviewed below is strong.



The economic and human value of cancer prevention

OECD microsimulation modelling shows what prevention could deliver if every country reached the best risk factor levels already observed in the region:[10]

- **Around 300,000 cancer cases prevented every year**, including 33% of new colorectal cancer cases and 27% of new lung cancer cases
- **300,000 fewer premature deaths annually** from cancer and other noncommunicable diseases sharing the same risk factors
- **€61 billion in annual healthcare savings**: €20 billion in cancer care and €41 billion for related diseases
- **The equivalent of 2.6 million additional full-time workers** in the European workforce

These are annual gains, not one-off savings, and most of them are still unclaimed. The interventions that deliver them already exist and are proven. What is missing is the investment to scale them, and the case studies below show that this investment pays for itself.

Case study: Tobacco control bans and school programmes

In 2016, Finland, Ireland, the Netherlands, Belgium, Germany, Italy and Portugal were all running policies aimed at reducing youth smoking: bans on smoking in public places, bans on sales to minors, bans on point-of-sale advertising, smoking bans in school premises, and school education programmes. A 2020 Horizon 2020-funded study assessed what these policies cost to implement and what they returned in health, using costs collected directly from the institutions enforcing them.

Every policy proved highly cost-effective in every country. Each one cost at least 45 times less per healthy life year gained than the WHO benchmark for a highly cost-effective intervention. The benchmark ranged from €22,500 to €53,300 per healthy life year gained, while the following costs were estimated for the policies:

- Non-school bans: between €4 and €253 per healthy life year gained
- School smoking bans: between €13 and €92 per healthy life year gained
- School education programmes: between €38 and €481 per healthy life year gained

Bans delivered the best value because they reach whole populations at a very low cost per person. The policies remained highly cost-effective even under the most pessimistic assumptions about their impact. The authors also excluded future healthcare savings and any change in smoking initiation or quitting, so the true return is likely higher.[51]

Case study: Gender-neutral HPV vaccination

The EU's 2024 Council Recommendation on Vaccine Preventable Cancers explicitly calls for Member States to move towards gender-neutral HPV vaccination.[52] A study, co-funded by the EU and the WHO, modelled the health and economic impact of this extension of HPV vaccination to boys, across eleven European countries: Austria, Belgium, Croatia, Estonia, Italy, Latvia, the Netherlands, Poland, Slovenia, Spain, and Sweden.

Key findings were as follows:

- Extending vaccination to boys at the same coverage as girls would prevent 168 (Croatia) to 467 (Estonia) cancer cases per cohort of 200,000 preadolescents – in addition to the 318 to 1,904 prevented cases from vaccinating girls alone
- The added cost of vaccinating boys ranged from I$4,300 to I$25,720 per life year gained across the eleven countries.[c]

This case study evaluates the exact policy shift EU cancer policy now recommends: moving from girls-only to gender-neutral HPV vaccination. It gives countries a clear indication of the health and economic returns they can expect from implementing that recommendation.[53]



c I$ stands for: international dollars

Case study: Lithuania's alcohol excise reform

Lithuania provides a useful example of the economic returns that can be generated through population-level alcohol control. On 1 March 2017, the country substantially increased alcohol excise taxes, raising rates by 112% for beer, 111% for wine and 23% for ethyl alcohol. The policy was designed to reduce alcohol affordability and was implemented as part of a broader strengthening of alcohol control in Lithuania; a study evaluated its returns from a societal perspective, comparing costs and outcomes during the 12 months before and after implementation.

In the first year following implementation:

- Alcohol excise tax revenue increased by more than €100 million
- Productivity losses decreased by approximately €35.3 million
- Healthcare costs decreased by approximately €3.8 million

These benefits were partially offset by increases in childcare and legal costs of €5.3 million and €4.6 million, respectively.

Overall, the analysis estimated a net economic benefit of approximately €136 million and a return on investment of €420 for every €1 invested in implementing the tax increase. The study therefore demonstrates that alcohol taxation can lead to substantial economic returns through a combination of increased government revenue and reductions in costs related to health-harming impacts of alcohol.[54]

Early cancer detection

Policy needs and interventions

Early detection is the identification of cancer at an initial stage, before it has grown large or spread, and it is one of the most effective ways to improve outcomes and use resources efficiently. It rests on two complementary approaches:

- **Screening** is the systematic invitation of people without symptoms, within a defined target population, to undergo testing so that pre-cancer or early-stage cancer can be detected before symptoms appear.
- **Early diagnosis** focuses on identifying cancer as quickly as possible in people who are already experiencing symptoms.

The two operate as complementary strategies rather than alternatives. Only certain cancers are eligible for screening, and screening will only ever detect a proportion of cases, so timely diagnosis of symptomatic disease remains essential.[55,56,57]

Screening: A programme and a pathway, not just a test

European policy on screening has been consistent for two decades. Since 2003, the Council of the European Union has recommended that screening for breast, cervical and colorectal cancer be delivered through organised, population-based programmes. The 2022 update extended the scope to lung, prostate and gastric cancer, and asked Member States to assess feasibility through pilot programmes.[58] For each cancer, the recommendations define the test, target population and screening interval for which the effectiveness of programmes has been established.

The test itself, however, is only one element of an effective programme. Organised screening requires a centrally managed system that identifies the target population, invites it systematically and follows up with those who do not respond. Opportunistic screening, which depends on individual initiative or on a clinician's suggestion, is less effective at reducing the cancer burden and can place additional strain on health systems. The benefits of screening are realised only when the full pathway is in place:[55]

- **Delivery of the screening pathway**, from invitation and information, through testing and the referral of positive results for diagnosis, to treatment, follow-up and the recording of outcomes.
- **Quality assurance and monitoring**, supported by screening registries and regular, published evaluation of programme performance against agreed indicators.
- **Governance and capacity**, including a clear legal and policy framework, strong multidisciplinary leadership, a trained workforce, sustainable funding and health system capacity planning.
- **Dedicated efforts to ensure equitable access**, so that participation does not depend on income, education or place of residence.

Early diagnosis: Removing the barriers between first symptom and diagnosis

WHO identifies early diagnosis as an essential strategy in every health system and sets out a pathway that begins with people recognising symptoms and reaching care.[57] The first stages of that pathway are those most closely linked to early detection. Four needs stand out at this first stage:

- **Improving health literacy**, so that people recognise possible warning signs of cancer and understand the importance of seeking care promptly.
- **Tackling cancer stigma**, which discourages people from coming forward when symptoms appear.
- **Facilitating access to primary care**, since cost, distance and limited time can all prevent people from obtaining a timely first consultation.
- **Streamlining referral pathways**, because delays frequently arise from poor follow-up, unclear routes to specialist care and fragmented services.

The economic and human value of early cancer detection

OECD modelling assesses early cancer detection together with diagnosis and treatment. If all countries improved screening and early diagnosis, coupled with equitable access to timely and effective treatment, and matched the best survival rates achieved across the OECD and EU, a quarter of all premature cancer deaths could be prevented and OECD workforce output could rise by €11 billion.[d9] Early detection is the first link in that chain.

Organised cancer screening saves lives. Evidence reviewed for the 5th European Code Against Cancer shows that:[59]

- Biennial mammography reduces breast cancer mortality by 18% to 23%
- Low-dose Computed tomography (CT) screening of high-risk groups reduces lung cancer mortality by 21%

These gains come from finding cancer earlier. Across nine European countries, 66% of screen-detected colorectal cancers were found at stage I or II, compared with 44% of those found outside screening. Only 8% of screen-detected cancers had already spread to other organs (stage IV), against 27% of those found outside screening.[60]

Where screening is weaker, the cost shows. Cervical cancer mortality is 6.3 per 100,000 women in Eastern Europe, against 3.9 in the rest of Europe, a gap that partly reflects uneven access to quality screening.[59]

Screening is also cost-effective. All four screening programmes recommended in Europe are generally regarded as cost-effective. Their cost per quality-adjusted life year (QALY) gained is as follows:

d Adjusted for purchasing power parity (PPP), which accounts for differences in price levels between countries.

- **Colorectal cancer screening:** cost saving to €6,000, because earlier detection avoids expensive treatment of advanced cancer
- **Cervical cancer screening:** €2,000 to €15,000
- **Breast cancer screening:** €5,000 to €25,000
- **Lung cancer screening:** €9,000 to €85,000. This is the widest range, driven by differences in CT and late-stage treatment costs between countries.

How much of this value is captured depends on programme design. The European models that have assessed risk-adapted breast screening found it more effective and efficient than conventional age-based screening.[61] Pairing lung screening with smoking cessation support improves cost-effectiveness enough to produce a net monetary benefit. Screening registries and quality assurance make personal invitations, individual follow-up and programme evaluation possible.[59]

New technologies could add further value. In Norway, modelling based on a randomised trial within the national programme found that switching from standard mammography to digital breast tomosynthesis over ten screening rounds could avert around 500 deaths and gain 2,300 life years, for €29 million in extra screening costs. Once treatment costs were included, tomosynthesis was both more effective and less costly in the main analysis.[62] A Swedish analysis found that its cost-effectiveness depends on how far it reduces breast cancer mortality.[63]



Case study: Extending screening age ranges and raising participation across four major European health systems

A 2026 modelling study by the Swedish Institute for Health Economics (IHE) assessed what it would cost, and deliver, to increase the numbers of people participating in breast cancer screening programmes in France, Germany, Italy and Spain.[64] Using a decision-analytic model built on national registry, Eurostat and treatment cost data, the study tested a range of scenarios, including lowering the starting age and/or raising the upper age limit of the programmes, and raising their participation rates to 75%, as recommended by the EU.

Key findings from the study were the following:

- Combined implementation of tested interventions across the four countries was estimated to save over 3,200 lives annually, a 9.3% reduction in breast cancer deaths, generating close to 53,000 life years and 35,000 QALYs gained each year. This would come at an additional annual healthcare cost of €662 million offset by a €142 million fall in productivity losses, for a net societal cost of €519 million, just 3.8% of the current societal cost of breast cancer.
- Nearly every scenario in every country fell within established cost-effectiveness thresholds. However, raising participation rates among women already eligible was generally the most cost-effective lever, compared with extension of the target age, and delivered the largest QALY gains at the lowest cost per outcome.

These findings give the EU's four largest health systems a quantified case for two converging priorities: continuing the phased extension of breast cancer screening eligibility toward women aged 45–74 (in line with European quality guidelines) and prioritising participation-boosting measures within existing eligible populations, which deliver the greatest mortality reduction per euro spent.



Case study: From clinical trial to EU policy to national implementation: lung cancer screening

The Dutch-Belgian NELSON trial randomised more than 15,000 high-risk current and former smokers to low-dose CT screening or no screening and found lower lung cancer mortality in the screened group, with a 24% reduction among men at ten years.[65] This evidence helped shape the Council's 2022 recommendation that Member States explore organised lung cancer screening, the first time lung cancer featured in EU screening guidance.[58]

National evaluations have since tested whether the policy would pay off. A modelling study for Austria applied NELSON outcomes to a high-risk population with 50% uptake. Annual screening of around 300,000 people would avert 11,906 premature lung cancer deaths, detect 25,893 additional early-stage cancers and gain 56,122 QALYs, at an incremental healthcare cost of €1.4 billion, or €24,627 per QALY. That is well below the study's €50,000 threshold and falls to between €12,697 and €18,297 per QALY when CT costs fall.[66] Valuing the QALYs at that threshold implies roughly €2.8 billion of health gain against €1.4 billion of cost, a net benefit of around €1.4 billion. The analysis took a healthcare payer perspective, so it excludes productivity gains. A Hungarian evaluation reached the same conclusion at a much lower cost per QALY of €5,707.[67]

Cancer diagnosis

Policy needs and interventions

Diagnosis connects the suspicion of cancer to the right treatment. WHO describes this stage as clinical evaluation, diagnosis and staging, and sets the benchmark that most patients should be diagnosed within one month.[57]

A successful cancer diagnosis delivers three things:

- **Confirmation of the cancer.** Imaging can raise suspicion, but only pathology confirms it. Definitive evidence of cancer is needed before staging or treatment.
- **Staging.** Staging establishes whether and where the cancer has spread, which determines the treatment a patient needs. The UICC TNM system is the common reference across Europe.[68]
- **Characterisation of the tumour.** This identifies the tumour's type and biological features, increasingly including its molecular profile.

Imaging and pathology remain the backbone of diagnosis, but molecular testing now plays a growing role. Next-generation sequencing (NGS) is recommended in a growing range of advanced cancers, to match patients with precision therapies.[69] Yet fewer than 10% of tumours requiring molecular testing are analysed with NGS.[70] The results are interpreted in Molecular Tumour Boards, which bring together those performing the tests with those deciding on treatment.[71,72]

New sampling routes can make diagnosis faster and less invasive. Liquid biopsy analyses circulating tumour DNA (ctDNA) from a blood sample.[73] Image-guided techniques, including robot-assisted biopsy, reach lesions that conventional methods cannot. Both can shorten the time to results, better preserve quality of life and reduce hospitalisation. In this respect, robotic-assisted bronchoscopy was recently suggested to be cost-effective in Scotland (£10,176 per QALY gained), although the evidence is indicative only, given the lack of comparative clinical data on earlier-stage diagnosis and the confidentiality of device pricing.[74]

The policy interventions needed are well established:

- Fast, coordinated diagnostic pathways with time targets
- Sufficient, quality-assured imaging and pathology capacity[57]
- Reimbursed biomarker testing, approved alongside the medicines it unlocks[70]
- Standardised Molecular Tumour Boards accessible to all patients[71]
- Minimally invasive sampling routes that shorten the path to diagnosis

The economic and human value of cancer diagnosis

Faster diagnosis saves money as well as lives. WHO reports that in high-income countries, treating cancers diagnosed early costs 2 to 4 times less than treating cancers diagnosed at an advanced stage.[75]

Within diagnosis specifically, the economic case for molecular and genomic testing has grown stronger as more cancers require testing for several biomarkers at once. A 2024 systematic review of the cost-effectiveness of next-generation sequencing (NGS) in oncology found that targeted NGS panels were cost-effective compared with single-gene testing once four or more genes needed to be tested, which is now the norm in many advanced cancers.[76]

European evaluations point the same way, including for less invasive testing routes that matter most to patients who cannot undergo a tissue biopsy:

- **Spain.** For patients with advanced lung cancer whose tissue cannot be sampled, blood-based NGS testing was cost-effective at €9,473 per QALY gained, against no molecular diagnosis.[77]
- **Germany.** Adding liquid biopsy to standard tissue testing in metastatic lung cancer improved quality-adjusted survival at €53,909 per QALY overall. For patients with EGFR mutations, it was both more effective and cheaper.[73]

This matters directly for the access gaps described above. Much of the current underuse of molecular diagnostics in Europe reflects funding and infrastructure barriers, not a lack of economic justification.[70] The value shown here therefore remains largely unrealised.



Case study: The economic value of ctDNA testing in advanced lung cancer

Liquid biopsy for ctDNA testing is of potential particular relevance for the molecular characterisation of tumours for which tissue samples would be difficult to access directly, such as in the case of non-small-cell lung cancer (NSCLC).

In this respect, an Edge Health evaluation commissioned by NHS England assessed the health and economic impact of introducing ctDNA testing in the diagnostic pathway of suspected advanced NSCLC.[78] If testing is introduced at an early stage, when a patient first presents with suspected stage III or IV lung cancer and before tissue biopsy results are available, the model estimated a total net benefit of the intervention, with benefits from testing surpassing its costs.

Data from 1,296 patients in a national pilot with suspected advanced thoracic cancer confirmed these modelling findings:

- **Genomic results were available around two weeks faster for patients undergoing liquid biopsy**, allowing earlier access to targeted treatment options (when available based on the identification of the individual tumour's actionable genetic alterations).
- **A net benefit of approximately £9 million, with a benefit-cost ratio of 1.1**, generated from both patients' improved treatment and quality of life, and avoided unnecessary testing and repeat biopsies.

Following the pilot, NHS England rolled out this "blood test first" approach nationally in 2025, becoming the first national health service in the world to offer liquid biopsy testing routinely, with up to 15,000 patients with suspected lung cancer expected to benefit each year.[79]

This evaluation shows that integrating advanced diagnostics early in the pathway can deliver returns that outweigh their costs, alongside faster, less invasive care for patients. Realising these returns depends on investment in laboratory capacity, faster result turnaround and specialist training.

Cancer treatment and care

Policy needs and interventions

Treating cancer well rarely means one therapy. It means the right combination of treatments, given in the right order, by the right team, in a setting with enough expertise and patient volume to deliver them safely.[80]

The three pillars of cancer treatment

- **Surgery** is the main curative option for most localised solid tumours.
- **Radiation therapy** destroys tumour cells with targeted radiation. About half of all cancer patients in Europe need radiotherapy at some point in their illness,[81] however **more than one in four of those patients do not receive it.**[82]
- **Medical oncology** uses medicines that act on the whole body, in three main ways:
  - *Chemotherapy* destroys cancer cells directly.
  - *Hormonal therapy* blocks the hormones that drive the growth of some tumours, such as breast and prostate cancer.
  - *Immunotherapy* activates the patient's immune system against the tumour. This is done with medicines such as immune checkpoint inhibitors, or with advanced therapy medicinal products such as CAR-T cell therapy, where a patient's own immune cells are re-engineered to target the cancer.[80]

These pillars work best in combination. Neoadjuvant treatment, given before surgery, shrinks a tumour so that it can be removed more

completely. Adjuvant treatment, given after surgery, removes remaining disease and lowers the risk of relapse. For many cancers, the best outcomes come from planned sequences of surgery, radiotherapy and systemic therapy rather than from any one of them alone.[80,83]

Emerging trends in cancer treatment

Cancer treatment is becoming more targeted. Among the most significant recent developments are:

- **Radioligand therapy (RLT):** RLT delivers radiation directly to tumour cells by attaching a radioactive particle to a molecule that binds to them, rather than aiming a beam from outside the body. It has already been shown to extend survival in advanced prostate cancer.[84]
- **Antibody-drug conjugates:** these link a potent anti-cancer drug to an antibody that seeks out tumour cells, so the drug reaches the cancer while sparing more healthy tissue.[85]
- **Precision oncology:** treatments are increasingly matched to the specific genetic changes in a patient's tumour.

New treatments only help cancer patients if they can receive them on time. In this respect, a meta-analysis projected that a four-week delay of cancer treatment is associated with increased mortality. Specifically, surgery showed a 6–8% increase in the risk of death for every four-week delay; the impact was even more marked for some radiotherapy and systemic indications, with a 9% and 13% increased risk of death for definitive head and neck radiotherapy and adjuvant systemic treatment for colorectal cancer, respectively.[86]

Beyond the treatments themselves, patient outcomes depend on the systems and infrastructure through which care is delivered. Precision oncology, for instance, depends on access to tumour genetic testing, which remains highly uneven across Europe and within countries, largely because of cost and reimbursement policies.[87]

Beyond the treatments: how care is delivered

Two requirements are widely recognised as essential for the best patient outcomes.

1. Where patients are treated

- **Specialist centres.** Complex treatments should be concentrated in centres that see enough patients to build and maintain expertise. For complex surgery such as pancreatic cancer surgery, higher hospital volume is consistently linked to lower mortality after the operation.[88]
- **Comprehensive Cancer Centres (CCCs).** These combine care, research and education under one roof, so that patients benefit directly from the latest evidence.
- **Quality assurance and accreditation** are in place for both specialist centres and CCCs across Europe. Systems include those run by the Organisation of European Cancer Institutes[89] and German certification programmes, as well as the emerging European Network of Comprehensive Cancer Centres created by the EUnetCCC Joint Action.[90]
- **Networks of centres** add a further layer of quality:
  - CCC networks let centres share practice and expertise[91]
  - For rare cancers, European Reference Networks (ERNs) also let experts in different countries discuss individual patient cases, so that expertise travels rather than the patient[92,93]

2. Who treats them

Multidisciplinary teams (MDTs) bring together the different specialists and professions involved in a patient's care to decide on a single treatment plan based on the full picture of the disease. MDTs are a core requirement in European quality standards for cancer care,[83,94] and evidence links them to better patient outcomes.[95]

These are organisational choices about where, how and by whom care is delivered, which makes them direct levers for policy and investment.

The economic and human value of cancer treatment and care

Investment in treatment translates directly into lives saved. Across Europe, countries that spend more on cancer care generally achieve higher survival, though the gain from each extra euro shrinks at higher spending levels. How money is spent matters as much as how much.[5]

The returns from new cancer treatments and medicines are measurable across Europe. An analysis of 29 European countries between 2014 and 2022 found that every €1 spent on new cancer medicines returned €6.80 in health and economic benefits, mainly through productivity gains and reduced hospital use.[96] National studies point the same way. In Spain, cancer medicines authorised between 2000 and 2016 were associated with 333,000 fewer life-years lost before age 75 in 2016, at around €3,300 per life-year gained.[97] In Belgium, medicines registered between 1987 and 1995 were linked to a 20% reduction in premature cancer mortality in 2012, at around €1,300 per life-year gained.[98] Both are far below the values health systems usually accept as cost-effective. Radiotherapy also offers strong value for money, as the case study below will show.

How care is organised also generates returns of its own. A Spanish study suggested that optimising the management of multiple myeloma could yield a return of 4.2 euros for each euro invested.[99] Treating patients in certified cancer centres improves survival while lowering costs, as the German case study below shows. Concentrating complex surgery has a similar effect: after the Netherlands centralised ovarian cancer surgery, the most complete tumour removal was achieved in 85% of patients in high-volume hospitals, against 71% in small hospitals.[100] Multidisciplinary working shows a similar pattern. A study of more than 13,000 women with breast cancer found that survival improved, and variation in care fell, after MDTs were introduced.[95]



Case study: Costing radiotherapy nationally with the ESTRO-HERO model

As noted above, many patients in Europe who need radiotherapy do not receive it. To give governments and payers reliable cost data for planning and funding, the European Society for Radiotherapy and Oncology (ESTRO) built a national costing model through its Health Economics in Radiation Oncology (HERO) project. The model calculates the full cost of a radiotherapy service, including staff, equipment and buildings, as well as the cost of each course of treatment. It has been applied nationally in England, using 2017 data, and regionally in Catalonia, using 2018 data.[101,102] Comparable European data show that radiotherapy accounted for between 4.3% and 12.3% of cancer care budgets across 12 countries, only 7.8% on average.[103]

In England, the model found that:

- Radiotherapy cost £467 million in total for 127,275 courses of treatment
- The mean cost was £3,672 per course
- This represented about 7% of estimated cancer spending
- Equipment, mainly the machines that deliver treatment, made up 62% of the total cost[101]

In Catalonia, the model found that:

- Radiotherapy across the region's 11 public centres, serving 7.5 million people, cost €42.2 million
- The mean cost per course was €4,094 for standard schedules, €2,577 for shortened schedules and €1,308 for the shortest[102]

The authors concluded that radiotherapy costs less than other cancer treatments and remains very cost-effective.[102]

Shorter treatment schedules may also lower costs. A five-session course for breast cancer cost £2,640 in England, against £3,637 for 15 sessions, a saving of 27%. Most radiotherapy costs are fixed, so the main gain from shorter schedules is machine time that can be used to treat more patients. Radiotherapy is therefore a modest and well-defined cost, which makes closing Europe's access gap affordable. The same cost data can also guide funding decisions, such as central purchasing and timely replacement of machines.[101]



Case study: Certified cancer centres in Germany

The German Cancer Society runs a national certification programme for cancer centres, which must meet set standards for how care is structured and delivered. Because certification requires extra resources, its value has been tested both for survival and for cost-effectiveness.

The WiZen study compared patients first treated in certified hospitals with those treated elsewhere, using nationwide health insurance and cancer registry data.[104] It found that:

- Treatment in a certified hospital was linked to better survival for all 11 cancer types studied, with the risk of death up to 23% lower for breast cancer
- If every patient had been treated in a certified hospital, an estimated 4,729 deaths within five years of diagnosis could be avoided every year in Germany, saving over 33,000 years of life[105]

A cost-effectiveness analysis of 1,909 colon cancer patients found that those treated in certified centres lived longer and cost the health system less than those treated in non-certified hospitals.[106] Certification required €13.7 million in extra costs for this group of patients, yet care in certified centres still came out cheaper overall. The authors found a 98.7% probability that certified centres offered better value for money. The extra cost of certification was more than offset by more efficient care.

Yet more than 40% of cancer patients in Germany are still first treated in a non-certified hospital,[104] leaving much of this value unrealised.

Cancer survivorship and quality of life

Policy needs and interventions

Survivorship covers life during and after cancer treatment, including for people living long-term with advanced disease. Quality of life means more than survival: it reflects the WHO view of health as complete physical, mental and social well-being, from the day of a patient's cancer diagnosis. As survival improves, more people are living with these needs. In 2020, an estimated 23.7 million people in Europe, 5% of the population, were alive after a cancer diagnosis.[6]

The disease and its treatment can affect people in many ways, often for years after treatment ends:[107]

- **Physical impacts:** pain, fatigue, insomnia, cognitive dysfunction, sexual dysfunction, malnutrition and other long-term or late effects of treatment, as well as comorbidities such as cardiovascular complications that need ongoing monitoring.
- **Psychological impacts:** distress, fear of recurrence, anxiety and depression. Of people diagnosed with cancer, 42% report symptoms of anxiety and 29.5% report symptoms of depression, and suicide rates are 85% higher than in the general population. Body image and fertility concerns weigh especially on young adults and women.[107]
- **Social and financial impacts:** strain on family, social and intimate relationships, and on informal carers. People face difficulty returning to work, workplace discrimination and lost income. They also face financial toxicity from the cost of care, and discrimination when seeking insurance, loans or mortgages. Up to 25% of survivors may have difficulty accessing financial services.[108]

Addressing these needs depends on three major elements being in place:

- **Access to the right professionals, integrated into the multidisciplinary team and the care pathway** throughout the patient's cancer journey**.** This includes

psycho-oncology, supportive and palliative care, pain management, nutrition, sexual medicine, rehabilitation and social work.

- **Protective legislation and support measures.** These include a legal Right to Be Forgotten, so that survivors are not penalised for past cancer when accessing financial services. They also include return-to-work protections, such as graduated return, workplace adjustments and adequate recovery time, and support for carers.
- **Organised long-term follow-up.** Every patient should receive a personalised survivorship care plan that sets out their follow-up and ensures access to it, with quality of life assessed routinely and care coordinated with primary care.

Where these services exist, they show measurable returns. The case studies below focus on two of them: return-to-work support and rehabilitation.

The economic and human value of cancer survivorship and quality of life

Much of cancer's productivity toll is incurred after treatment ends, through sick leave, reduced working hours and early exit from work. This is where survivorship care pays off. European trials show that well-organised survivorship care improves quality of life and often lowers costs, both for health systems and for the wider economy.

- **Moving follow-up to primary care saves money without compromising care.** In the Netherlands, General Practitioner (GP)-led follow-up for colon cancer survivors cut total societal costs by €3,895 per patient compared with surgeon-led follow-up. Most of the saving, €3,305, came from lower productivity losses, and outcomes on cancer-specific quality of life were better.[109] In Norway, GP-organised follow-up also lowered societal costs, with no decline in quality of life and no delay in detecting recurrence.[110]
- **Exercise during and after treatment can pay for itself.** In the Dutch PACT trial, an 18-week supervised exercise programme during chemotherapy for colon cancer saved €4,321 per patient while improving quality of life.[111] After chemotherapy, a high-intensity exercise programme was cost-effective compared with a lower-intensity one, mainly because it reduced healthcare costs.[112]
- **Treating depression in cancer patients is cost-effective.** In Scotland, an integrated, nurse-led depression care programme cost £631 per patient and delivered a cost of £9,549 per QALY gained, well below the UK's threshold of £20,000 to £30,000.[113]

The pattern is consistent: survivorship care costs little relative to the gains it delivers in quality of life and productivity.



Case study: Return-to-work support for cancer survivors

A Dutch study modelled the budget impact of scaling up a return-to-work programme for working-age cancer survivors between 2015 and 2020.[114] The programme starts alongside cancer treatment and combines two counselling sessions with an occupational physician and a 12-week supervised exercise programme. The authors also compared who pays for and who benefits from such programmes across the Netherlands, Belgium, England, France, Germany, Italy and Sweden.

Key findings were as follows:

- The programme costs an average of €1,519 per patient.
- Across the Netherlands, productivity gains far outweighed the costs: €92 million in gains against €15.4 million in costs in 2020. The result was net savings of €14.7 million in 2015, rising to €71.1 million in 2020.
- The programme stayed cost-saving even if its effect on working hours was five times smaller than expected.
- However, cancer centres bear most of the cost while employers, patients and pension funds reap the gains. For a large cancer centre, offering the programme meant a net cost of €293,000 in 2015, rising to €1.1 million in 2020, because only around 10% of patients were reimbursed. Only Germany and France had payment systems that rewarded providers for offering it.

The programme saves society money, but the current funding structures discourage its uptake. Aligning who pays with who benefits, for example through employer or social insurance contributions, would unlock savings that are currently lost.

Case study: Cardio-oncology rehabilitation

Cancer survivors face a higher long-term risk of cardiovascular disease, often as a late effect of treatment. The CORE trial in Portugal tested an 8-week cardio-oncology rehabilitation programme for survivors at high cardiovascular risk. Based on the established cardiac rehabilitation model, it combined supervised exercise with nutritional counselling, psychological support and health education.[115,116] It was compared with community-based exercise.

Key findings were as follows:

- Centre-based cardio-oncology rehabilitation improved cardiorespiratory fitness and cardiovascular risk factors more than community exercise.
- It was cost-effective at just €1,383 per quality-adjusted life year (QALY) gained, far below usual European cost-effectiveness thresholds.

Cardio-oncology rehabilitation builds on cardiac rehabilitation services that health systems already run, making it a practical and affordable addition to survivorship care for patients at cardiovascular risk.

Cancer research and innovation

Policy needs and interventions

Research and innovation sit upstream of every other section of this study. Each gain throughout the cancer pathway traces back to research that needed sustained investment before it paid off.

Cancer research sets out to answer three broad questions:

- **How does cancer develop?** Discovery research studies how tumours form, grow, spread and resist treatment. It builds the knowledge that later research turns into practical tools.
- **What works for patients?** Clinical and translational research turns that knowledge into interventions and tests them, from screening tests and surgical techniques to radiotherapy, medicines and supportive care. Independent academic trials provide important contributions by looking into how to optimise existing therapies, combine treatments or tailor care to patient needs.[117,118]
- **How do we make it work for everyone?** Population and health systems research, spanning epidemiology, implementation science, health economics and social science, shows which interventions to prioritise, at what cost and how to deliver them at scale.

Europe has long invested unevenly across these questions. In the early 2000s, biology received 41% of European cancer research funding, against 20% for treatment and only 4% for prevention.[119] Two decades later, the imbalance persists. Discovery science and biopharmaceutical research still dominate, while prevention and early diagnosis, radiotherapy and surgery, implementation science and survivorship remain underserved.[120]

There is no single agreed formula for successful research. The literature does, however, point to a consistent set of conditions:

- **Stable, long-term funding**, including public funding for independent research. Europe has trailed for decades: in the early 2000s, the EU-25 spent €2.56 per person on public cancer research, against €17.63 in the United States.[121]
- **Research embedded in care**, with comprehensive cancer centres acting as hubs that link research and treatment.[120]
- **Skilled people**, with training, career paths and protected time for clinicians and scientists to do research.
- **Shared infrastructure**, such as biobanks, imaging and genomics platforms and clinical trial networks.[122]
- **Linked, high-quality data** to guide research priorities and planning.[120]
- **Proportionate regulation**, particularly for academic trials, which are most exposed to administrative burden.[117]
- **A route from evidence to practice**, through implementation science and the structures that bring new findings into routine services.[120]

These conditions are unevenly spread, with Central and Eastern Europe facing a widening gap in research activity and capacity.

The economic and human value of cancer research and innovation

The value of cancer research is hard to isolate, because it flows into every step of the cancer pathway. Its cumulative impact is nonetheless visible: research is a key driver of the rising survival and falling age-standardised mortality seen across most European cancer systems, with an estimated 6.8 million cancer deaths averted in the EU between 1989 and 2025.[123]

EU funding has played its part in this progress. A Joint Research Centre evaluation of two decades of EU-funded breast and prostate cancer research (1999–2019) found that research output grew steadily as investment rose, with the number of breast cancer projects launching clinical trials tripling. EU-funded trials also contributed to new medicines with novel mechanisms of action, part of a wave of targeted therapies that has extended survival and improved quality of life for patients with both cancers.[124]

Research activity also improves care directly. In England, hospitals with sustained high participation in clinical trials achieved 5-year colorectal cancer survival of 44.8%, against 41.0% in hospitals with none, and the benefit reached all their patients, not only trial participants.[125]

Beyond health, research is a strategic industrial asset. Industry-sponsored clinical trials generate an estimated €35.7 billion in gross value added and support 165,000 jobs across the European Economic Area each year.[126, e] But this base is shrinking: Europe's share of global commercial trials fell from 22% in 2013 to 12% in 2023.[127] Reversing the trend has a measurable payoff. Meeting the Joint EU regulatory target of an 11% increase in trial activity would add an estimated €4 billion a year in economic activity and 18,000 jobs.[126]

The clearest direct estimate of what cancer research returns is examined in the case study over the page.



e The clinical trial figures in this paragraph cover industry-sponsored trials across all therapeutic areas in the European Economic Area, not oncology alone. Oncology is the largest single therapeutic area, accounting for more than a quarter of trials conducted in Europe, so cancer research makes up a substantial share of this value, but no cancer-specific estimate is available.

Case study: The return on UK public and charitable cancer research funding

A study led by RAND Europe, Brunel University and King's College London asked whether public and charitable spending on cancer research pays for itself through the health gains it produces.[128] It traced £15 billion of UK cancer research funding between 1970 and 2009 through to the health gains delivered by research-based interventions between 1991 and 2010.

The research paid back substantially:

- **5.9 million quality-adjusted life years** gained from prevention, screening and treatment interventions based on global research, worth a net £124 billion after deducting the cost of delivering them.
- **A 10% annual return from health gains alone**, nearly three times the UK government's 3.5% threshold for public investment.
- **Around 40% a year once wider economic benefits are included.** Every £1 invested produced benefits equivalent to roughly 40p a year, indefinitely.
- **Returns came from across the pathway.** Research on smoking and the tobacco control policies it informed generated 65% of the net benefit, cervical screening 24% and breast cancer treatment 10%.

The returns take time to build: the study estimated an average 15-year lag between research funding and health gains reaching patients. Investment in cancer research pays for itself many times over, and today's research budgets shape the health and economic gains of the decades ahead.

Cancer control infrastructures

Policy needs and interventions

Infrastructure is what allows cancer control to be delivered at scale. It is easy to overlook because it is invisible when it works, yet every step of the pathway depends on it. Without the right equipment, facilities and data systems, the gains described elsewhere in this paper, from earlier detection to better-matched treatment, are hard to realise for whole populations.

Infrastructure needs in cancer control include:

- **Equipment and technology:** imaging, radiotherapy, laboratory and pathology services, and genomic testing, maintained and updated as technology advances.
- **Facilities across the pathway:** vaccination and screening services, diagnostic laboratories, cancer centres, and rehabilitation and survivorship services.
- **Networks and coordination:** links between these facilities so that expertise, practice and patients can move where they are needed, coordinated at the right level of governance, for example by national cancer institutes. For rare cancers in particular, this extends across borders through the European Reference Networks.
- **Cancer registries:** the backbone of population-level monitoring and quality assurance, tracking cancer incidence, stage, treatment and survival.
- **Digital systems:** electronic health records and interoperable data sharing, which improve individual patient care and allow data to be reused for research and planning. Linking registry data with clinical, genetic and administrative data greatly expands what health systems can learn.[129]

Important gaps remain. Access to equipment, facilities and data systems still varies widely across and within European countries, and several of these gaps have been highlighted in earlier sections of this paper. Even the most basic monitoring infrastructure is incomplete: three of 29 EU+2 countries still lack a national cancer registry covering their whole population, and the quality and completeness of registry data vary widely.[12,129]

The economic and human value of cancer control infrastructures

Health data infrastructure is often treated as a back-office cost, yet its economic case is well quantified. Better use of health data generates billions in value. The European Commission's impact assessment for the European Health Data Space estimated that:

- **Reusing health data for research, innovation and policymaking** (secondary use) would generate at least €5.4 billion over ten years, through more efficient data access for researchers and innovators, greater transparency for regulators, and better value for patients and providers.
- **Using health data in direct patient care** (primary use) would generate a further €5.5 billion over the same period, largely through wider uptake of telemedicine and better cross-border care coordination.[130]

These are projections rather than retrospective evaluations. But they underpin legislation now in force, making them a reasonable guide to what the EU itself expects this investment to deliver.

Cancer registries deliver high value at very low cost. A study of 18 European cancer registries covering 58.8 million people found that:

- Registration costs an average of €0.27 per inhabitant, or €50.71 per case registered.[f,131] This is very small next to the €51 billion the EU spent on cancer care in a single year around the same period.[7]
- Personnel accounted for 79% of costs, so sustaining registries depends mainly on stable workforce funding rather than one-off equipment purchases.[131]

Since registries are the data source that makes every other cost-effectiveness estimate in this paper possible, their low relative cost strengthens rather than competes with the case for investment elsewhere in the pathway.



f Expressed in purchasing power standards (PPS), a common unit that removes differences in price levels between countries.

Case study: Digital pathology adoption across European laboratories

Digital pathology replaces the microscope with high-resolution scans of tissue slides. It speeds up diagnosis, makes second opinions across sites easier, and is a precondition for AI-assisted diagnostics. It does, however, require upfront investment in scanners, storage and IT systems.

A 2025 study assessed whether that investment pays off, using a net present value model built on data from eight major public and private pathology laboratories in the UK, Germany, France, Spain and Italy.[132]

The investment pays for itself:

- **A positive net present value of €0.21 million over seven years**, driven by higher productivity and the capacity to handle more diagnoses.
- **Break-even in year three**, with cash flow positive from then on.
- **Most of the benefit came from absorbing rising caseloads without proportional increases in staff**, with further gains from easier second-opinion consultations between sites and countries.
- **Faster diagnosis for patients:** turnaround times fell by more than 15%, and cross-site second opinions rose by 19%.

The authors note that the benefits grow with scale, pointing to networked models such as Catalonia's DigiPatICS programme, which connects multiple hospitals through shared infrastructure. Digital pathology pays back within a few years, and delivers the most when built as shared, connected infrastructure rather than hospital by hospital.



Case study: France's national sarcoma reference network

Sarcomas are rare and varied cancers that are easily misdiagnosed outside specialist centres. Since 2010, France has required expert pathology review and discussion at a specialist multidisciplinary board for all suspected sarcoma cases. Cases are routed through a national network of reference centres, NETSARC, and its pathology arm, RRePS, funded by the French National Cancer Institute.[133] This connects the whole health system to a small pool of scarce expertise, rather than trying to recreate that expertise in every hospital.

Expert review saves money by correcting misdiagnoses. An analysis of 2,425 patients reviewed through the network found that:

- **14% had received a discordant diagnosis before expert review**, most often a benign tumour wrongly diagnosed as a sarcoma.
- **Managing patients on the reviewed diagnosis cost less** (€8,791 per patient) **than on the original diagnosis** (€8,904), even after paying for the review itself, because unnecessary surgery and treatment were avoided.[134]

The network improved outcomes nationwide. Across almost 44,000 patients registered since 2010:

- **Survival improved as the network matured, with a 24% reduction in the relative risk of death** one year after diagnosis.
- **The share of patients whose tumour was completely removed at first surgery rose from 36.1% to 46.6%**, and adherence to clinical guidelines improved.[133]

The same model of connecting scarce expertise across a health system operates at European level through EURACAN, the European Reference Network for rare adult solid cancers. Organising expertise as a network rather than spreading it thin pays off twice: fewer costly misdiagnoses, and better survival for patients wherever they are treated.

Cancer workforce

Policy needs and interventions

Every intervention described in this paper depends on people to deliver it. The policy needs of the cancer workforce are largely those of the health workforce as a whole, built around three core components:[135]

- **Recruitment**, guided by workforce planning that matches the supply of professionals to future need.
- **Training and professional development**, so that staff have the skills that care requires today and tomorrow.
- **Retention**, through fair pay, good working conditions and attention to staff wellbeing.

Cancer adds particular demands of its own. As a complex disease, it needs a strong supply of specialists across many disciplines. As a long-term disease, it relies on teams that work together across primary and secondary care, from diagnosis through to survivorship. It is also a fast-moving field, where continuous training is essential to keep pace with new technologies and practice, from genomics to AI. And because cancer accounts for a large and growing share of health system demand, it calls for careful workforce planning and room for innovative models of care, such as expanded nursing and allied health roles. Annual cancer cases in the EU are projected to rise by 18% by 2040.[129]

Many of these needs are currently not being met. EU countries faced an estimated shortage of around 1.2 million doctors, nurses and midwives in 2022, and over a third of doctors and a quarter of nurses are aged over 55.[136] In cancer care specifically, a survey of more than 700 professionals across 30 European countries found that 19% experience high levels of burnout and 77% often work overtime.[29]

The economic and human value of the cancer workforce

Investing in the cancer workforce brings returns in two forms: safer care for patients, and better use of scarce professional skills.

The clearest evidence on patient safety comes from a study of more than 420,000 surgical patients in 300 hospitals across nine European countries. It found that each additional patient added to a nurse's workload increased the odds of a patient dying within 30 days of admission by 7%. Nurse education mattered just as much: every 10% increase in the share of nurses holding a bachelor's degree lowered those odds by 7%.[137] Staffing levels and training are therefore not simply questions of cost, but of lives saved.

Making better use of existing skills also generates savings without compromising care. In Sweden, follow-up after breast cancer led by specialist nurses was 20% cheaper than routine follow-up by physicians, at €495 against €630 per patient per year. That difference adds up to nearly €900 per patient over five years.[138] A Dutch trial reached a similar conclusion: nurse-led telephone follow-up, combined with a short educational programme, proved a cost-effective alternative to hospital visits in the first year after breast cancer treatment, with patients just as satisfied.[139]

Together, these findings show that investing in the right number of staff, with the right skills and in the right roles, both improves patient outcomes and makes every euro spent on cancer care go further.

Case study: The return on specialist cancer nurse support in England

Clinical nurse specialists and care coordinators guide patients through diagnosis, treatment and life after cancer. In England, this one-to-one support was found to be strong during diagnosis and treatment, but to fall away in aftercare and for people living with metastatic disease, the stages where patients often need it most. To test whether closing this gap would be worth the cost, the Department of Health commissioned Frontier Economics to model the costs and benefits of extending one-to-one support to every cancer patient in the country.[140]

Closing the gap was shown to pay for itself:

- Around 1,234 additional support workers would be needed across England, at a cost of roughly £60 million a year, plus around £10 million for exercise classes to support recovery.
- The resulting benefits to the NHS were estimated at £89 million a year, from fewer consultant follow-up appointments, more nurse-led aftercare, fewer emergency bed days, and more patients able to die at home rather than in hospital.
- The investment would deliver net savings of around £19 million a year to the NHS, with savings expected in most of the cancer types modelled.
- Avoided emergency admissions were a major driver. Fewer emergency bed days accounted for between a fifth and two-thirds of savings across the cancers modelled, rising to more than 70% in lung cancer, where patients are admitted as emergencies particularly often.

In some respects, the estimates are cautious. Savings from nurse-led diagnostic clinics were left out of the central estimate, and wider benefits were kept separate from NHS savings. For children and young people alone, better support was estimated to raise lifetime earnings by £2.3 to £4.7 million a year through improved educational attainment. As cancer care moves towards personalised medicine, molecular diagnostics and coordinated, multidisciplinary care, all of which are workforce-dependent by design, investment in the cancer workforce is not a cost that competes with innovation, but the precondition for innovation delivering its promised return.

Cancer equity

Policy needs and interventions

Cancer follows the same social gradient as health in general. People with lower income or education, and groups facing marginalisation or discrimination, are more exposed to risk factors, less likely to be screened, more likely to be diagnosed late and more likely to struggle with the cost of care. Across the EU, educational gaps in cancer mortality reach 31% for women and 83% for men. Screening participation is 45% lower for breast cancer and 40% lower for colorectal cancer among people with lower incomes.[12] Once in treatment, 16% of European cancer patients postpone or avoid care because of cost.[12,18]

Some inequalities are specific to how cancer services are designed. Screening programmes built around sex invite people according to the gender recorded in health registers, which can leave trans and non-binary people out. In England, trans men registered as male are not invited for breast or cervical screening.[141] Geography matters too. Concentrating treatment in specialised centres raises quality, but it places a burden on people in rural and remote areas. In Scotland, patients with longer travel times had worse one-year survival even though they were diagnosed just as quickly.[142]

The policies needed to close these gaps are well established.

WHO Europe identifies five areas where action reduces health inequalities: health services, income security and social protection, living conditions, social and human capital, and employment and working conditions.[143]

Two principles run through this work. The first is Health in All Policies. The second is proportionate universalism, meaning universal services delivered at a scale that matches need.[144]

In cancer control, this translates into:

- **Screening that actively reaches** low-income groups, marginalised communities, people with disabilities and remote areas, as the Council Recommendation on cancer screening requires[58]
- **Removing out-of-pocket costs** across the pathway
- **Organising access around specialised care** through networks, outreach and travel support
- **Linking cancer registries to socioeconomic data** so gaps can be measured and tracked

Inequalities are where cancer investment loses value. Closing them turns spending already made into lives saved.

The economic and human value of cancer equity

The value of action against inequalities can be measured by asking what would happen if everyone had the outcomes of the most advantaged. For cancer, IARC-led research across 18 European countries has done exactly that.

If people with lower education had the same cancer mortality as the most educated, 32% of cancer deaths in men and 16% in women would be avoided.

In Baltic, Central and Eastern Europe, the figures rise to 46% and 24%.[145] Survival data tell the same story.

In England, giving all patients the survival of the most affluent would prevent around 7,100 cancer deaths a year, 11% of deaths within three years of diagnosis.[146]

The economic returns of levelling up have been modelled at European level for health inequalities as a whole. WHO Europe estimates that halving the gaps in life expectancy between social groups would bring benefits worth 0.3% to 4.3% of GDP, depending on the country.[147] The scale reflects

what inequalities currently cost. They are linked to 20% of EU healthcare costs, 15% of social security benefit costs, and welfare losses of €980 billion a year, or 9.4% of GDP.[148] Cancer is one of the largest contributors to these gaps, so a substantial share of this value lies within cancer control.

The key to realising this value is going where the gap is. Population-wide invitations tend to reach people who already take part. The OECD therefore recommends delivery models that reach vulnerable groups in their own communities, such as mobile screening units and self-sampling.[27] Removing out-of-pocket costs also significantly increases screening uptake.[12] Targeted approaches can cost more per person reached, but they reach the groups where most avoidable cancer deaths are concentrated, as the case studies below show.

Case study: Mobile screening units to reach underserved women

Breast screening works, but it reaches women unevenly. Participation is lowest in remote and deprived areas. Two European evaluations show that taking screening to these women, through mobile mammography units, is good value for money.

In Normandy, France, a mobile unit was deployed in remote and deprived areas with low screening uptake. A cost-effectiveness analysis of 37,461 women compared an invitation offering the mobile unit or a radiologist's office with an invitation to a radiologist's office alone.[149] It found:

- Participation rose by 3.8 percentage points
- The incremental cost was €23.21 per woman invited, or €610.69 per additional woman screened
- Gains were largest among women in deprived areas and those living more than 15 km from a radiologist

In Southern Italy, where screening participation lags well behind the north, researchers used the EU-funded EU-TOPIA microsimulation model to assess investment in mobile units.[150] They found:

- Raising participation through mobile units cost €9,531 per quality-adjusted life year gained, an acceptable level of cost-effectiveness
- Combining mobile units with a uniform two-year screening interval nationally would cut total screening costs by 19% while giving up only 1% of life-years gained

The two studies reach the same conclusion from different directions. One evaluates a programme already running in France; the other models a national policy choice in Italy. Both show that targeting screening at the women it currently misses is not a trade-off between equity and efficiency. In Normandy, the gains were greatest exactly where the standard system was failing. In Italy, closing the regional gap came at a cost per QALY well within what European health systems routinely pay. Mobile units also build on screening programmes that already exist, so they need only modest capital investment to scale. Reaching underserved populations is an efficient way to make existing screening investment pay off.

Case study: Patient navigation for colorectal cancer screening among deprived populations

Distance is only part of the problem. Deprivation and low health literacy also keep people from screening, wherever they live. In the Picardy region of northern France, a cluster-randomised trial tested patient navigation. In this approach, a trained social worker helps people understand, schedule and complete their colorectal screening test. 16,250 people took part, and the trial evaluated cost-effectiveness from the payer's perspective.[151]

Navigation increased screening participation at a cost of €1,212 per additional person screened. Among deprived participants, the cost rose to €1,527, reflecting the extra effort needed to reach this group. The authors concluded that navigation should be targeted at deprived populations, accepting a higher cost per person screened in order to narrow the gap.

Reaching the people screening misses costs more per person, and this trial puts a clear price on that choice. It gives policymakers a concrete figure to weigh against the savings from detecting colorectal cancer earlier.

Case study: Self-sampling to reach structurally underserved women across Europe

Some women are underscreened for reasons unrelated to geography or income. These include cultural barriers, past negative experiences, or the discomfort of a clinician-administered test. A 2023 systematic review assessed the cost-effectiveness of interventions to increase cervical screening among underserved women in Europe.[152]

HPV self-sampling, in which women collect their own sample at home or in a community setting, stood out as cost-effective:

- Around €69 per additional woman screened
- Between €4,784 and €11,825 per additional high-grade precancer (CIN2+) detected

The review also exposed a gap. No European economic evaluation has yet assessed cost-effectiveness for specific groups such as migrant, ethnic minority or LGBTQI+ women. The economic case exists only for underserved women as a whole.

Self-sampling is a proven, cost-effective way to reach women that standard screening misses. Building the evidence for the specific groups within that population is the next step.

Annex: Methodology

This study brings together existing evidence on the human and economic returns of cancer control action. Its scope is geographic Europe.

Evidence gathering

Evidence was gathered through two channels. Desk research covered peer-reviewed literature and grey literature published by international organisations (including the OECD, IARC, WHO), EU institutions, health economics institutes and national health bodies. This was complemented by a call for evidence inviting stakeholders to submit studies, evaluations and case studies on the returns from cancer control interventions.

Selection of evidence and case studies

Priority was given to recent evidence that quantified economic or human returns. Case studies were selected to show, in concrete terms, the value that specific interventions have delivered or could deliver in European settings. They cover different levels of implementation, from randomised trials and pilots to regional programmes, national policies and EU-funded initiatives. They also draw on different types of evidence, including trials, observational studies, modelling and retrospective evaluations.

Limitations

The economic evidence in this study is summarised for a policy audience, and several points should be kept in mind when reading the figures:

- **Different types of economic evaluation.** The studies use different methods, including cost-effectiveness analysis (cost per QALY, life year or healthy life year gained), return on investment, cost-benefit analysis, budget impact analysis, net present value and cost-of-illness estimates. These answer different questions and their results cannot be compared directly.
- **Different perspectives and comparators.** Some studies count only costs to the health system. Others also include productivity losses and wider societal costs, which can change results substantially. Results also depend on what an intervention is compared with, such as no intervention or current practice.
- **Different thresholds and time horizons.** Whether an intervention is considered cost-effective depends on the threshold used, which varies between countries and studies. Many cancer interventions only pay off over long periods, so results also depend on the time horizon and discounting applied.
- **Currencies and price years.** Figures are reported as published in the original sources, in different currencies (including euros, pounds, international dollars and purchasing power standards) and different price years. They have not been converted or adjusted for inflation, and price years are not always stated in the text.
- **Simplification.** For conciseness, study methods, assumptions and uncertainty ranges are not always described in full, and central estimates are generally reported.
- **Modelled versus observed results.** Much of the evidence is based on modelled projections rather than observed outcomes.

- **Selection and publication bias.** This paper sets out to make the case for investment in cancer control. It therefore showcases interventions that have delivered or are projected to deliver positive returns, and does not systematically review evidence on interventions that proved ineffective or poor value. In addition, studies showing favourable results are more likely to be published and submitted in response to calls for evidence.
- **Geographic coverage.** Evidence is concentrated in Western and Northern Europe, with more limited data available from Central and Eastern Europe.
- **Funding sources.** The studies cited were funded by a range of sources, including public authorities, EU research programmes, academic institutions, professional societies and industry. Funding sources are not reported for each study in this paper, and readers are referred to the original publications for this information.

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Publication: November 2026

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