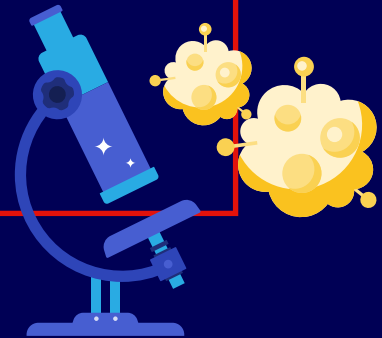




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# Sustainable oncology care: a European perspective



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# Contents

<b>3</b>	<b>Executive summary</b>
<b>5</b>	<b>About this report</b>
<b>7</b>	<b>Introduction</b>
<b>8</b>	<b>Europe's uneven cancer landscape</b>
<b>10</b>	Economic considerations HTA and reimbursement processes
<b>11</b>	Affordability Financial instruments Prevention and early detection Capacity shortfalls Innovation
<b>20</b>	Measuring Health System Performance
<b>23</b>	<b>The way ahead</b>
<b>25</b>	<b>Country profiles</b>
<b>26</b>	Sweden
<b>27</b>	Estonia
<b>28</b>	Romania
<b>29</b>	Poland
<b>30</b>	<b>References</b>

# Executive summary

Cancer incidence is rising across the European continent, with large geographical variations in prevalence, disease management and outcomes. Socioeconomic factors, financing, and health system design and performance lead to significant divergence, with disadvantaged populations facing worse prospects.

The positive implication is that cancer outcomes are not predetermined; they can be influenced by policy choices and system design. Key factors include flexible financing arrangements to ensure equitable access to appropriate therapies; harnessing technology to improve service efficiency; investing in prevention; and efficient and effective approvals and reimbursement processes, especially for effective emerging and novel cancer therapies.

This Economist Impact report, supported by BeiGene, draws from an expert interview programme and literature review, and assesses the key factors shaping access to and affordability of oncology care in a subset of European countries. Key findings that emerged from this research include:

- **To support improved cancer outcomes in a sustainable manner, health systems must adapt.** Rising cancer incidence is putting pressure on health budgets and impinging

financial sustainability, forcing European health systems to explore innovations like service design and technology to improve access to both existing and emerging effective therapies and technologies. Some emerging therapeutic approaches have different cost dynamics to conventional treatment, which may require the use of alternative methodologies like reference pricing, spread payments, price-volume agreements and outcomes-based financing.

- **Innovations in cancer therapeutics and financing can improve the pricing of therapies and increase affordability for lower-income countries and patients.**

Distinct dynamics of some new and emerging oncology therapies can impact affordability and the long-term financial sustainability of cancer care, but recent improvements in science and technology have led to innovations in treatments. These, alongside innovations in financial instruments, could improve pricing of therapies and thereby boost affordability for countries with limited budgets. The use of AI in drug development could further improve cost dynamics by shortening research and development cycles.

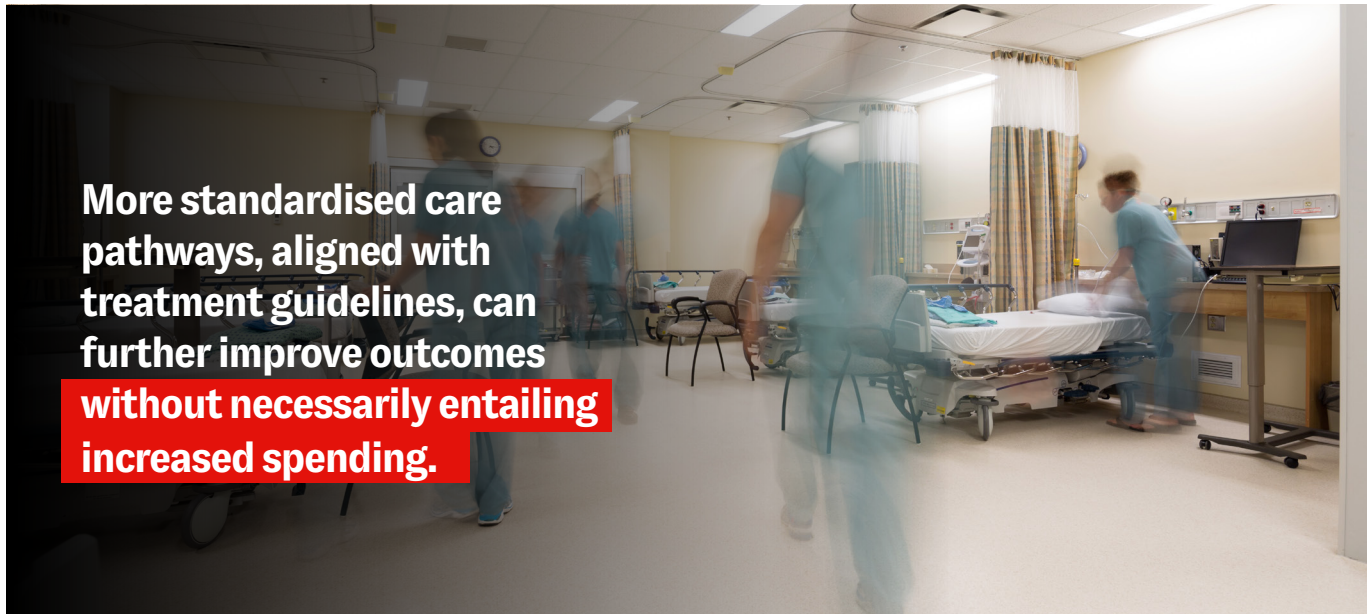
- **Improving outcomes does not necessarily require higher spending.** European health

systems can improve access to therapies by tackling complex, bureaucratic or outdated reimbursement protocols, improving adherence to treatment guidelines and regimens, and aligning health technology assessment (HTA) approaches, which differ markedly across the continent. They can also work to incorporate the patients voice in these processes. More standardised care pathways, aligned with treatment guidelines, can further improve outcomes without necessarily entailing increased spending. Innovations in pharmaceutical research and development and more efficient manufacturing, including those led by companies with a lesser cost base, could also bring down the cost of next-generation oncology treatments in future.

- **Because cancer treatment cost and complexity increase with disease stage, high-return investments can be achieved in prevention and early detection.** Prevention and early detection,

including through more advanced measures like genomic testing and comprehensive screening, significantly impact cancer outcomes for patients, their families and society at large, and pose more favourable cost dynamics than later-stage interventions. Diagnosing cancer at a late stage leads to a cascade of costs on the individual and the health system.

- **Lower-income countries face a worrying healthcare workforce challenge in oncology.** Burnout, “brain drain” and attrition are all leading to a major outflow of skills and talent from central and eastern Europe, undermining national investment by lower-income countries in skilled workers to the benefit of high-income economies. Measures to retain workers and ensure availability in neglected areas are key, as is policy in high-income countries to tackle or compensate for this growing workforce inequity. Technology can also help to relieve pressure through automation and telemedicine.



More standardised care pathways, aligned with treatment guidelines, can further improve outcomes without necessarily entailing increased spending.

# About this report

This report aims to understand the factors shaping financial sustainability, affordability, accessibility and equity across the care pathway for cancer. It includes insights from a series of experts including patient advocates, health economists, policy experts and medical specialists. The report identifies measures to improve health system sustainability, focusing on one country in western Europe (Sweden) and three in eastern Europe (Estonia, Romania and Poland). The rationale for this study is the rising cancer incidence and its implications for health system sustainability and access.

The research approach consisted of an evidence review conducted across various scientific databases and search engines, including PubMed, Google Scholar and the OECD library. In addition to searching scientific databases, we conducted a grey literature search to retrieve policies, guidelines and targeted information that were not uncovered by previously selected methods.

The following research questions guided this study:

1. What are some projected trends in oncology and population health in Europe that can impact sustainability, especially in central and eastern Europe?
  - a. What are the challenges of affordability, accessibility and equity in selected markets?
2. What are the common definitions and understandings of health system sustainability in Europe?
  - a. How can the multidimensional aspects of health systems, along with their dynamic relationship with economics, policy, environment and population, impact the sustainability of oncological care?
  - b. What contributes to health system sustainability?
  - c. What challenges will the ageing population pose on health systems that can impact access to care?
3. What metrics, perspectives or processes have been used to research the components of sustainability?
  - a. What examples are there of measurable impact (in terms of effect and influence) of policies that target the affordability, accessibility or quality domains within the broad concept of health system sustainability?
4. How can cancer treatments be made

available that are manageable and affordable to the healthcare system?

- a. Does the lack of affordable interventions lead to worse cancer outcomes?
- b. How can affordability and accessibility be improved where there is a lack of access?

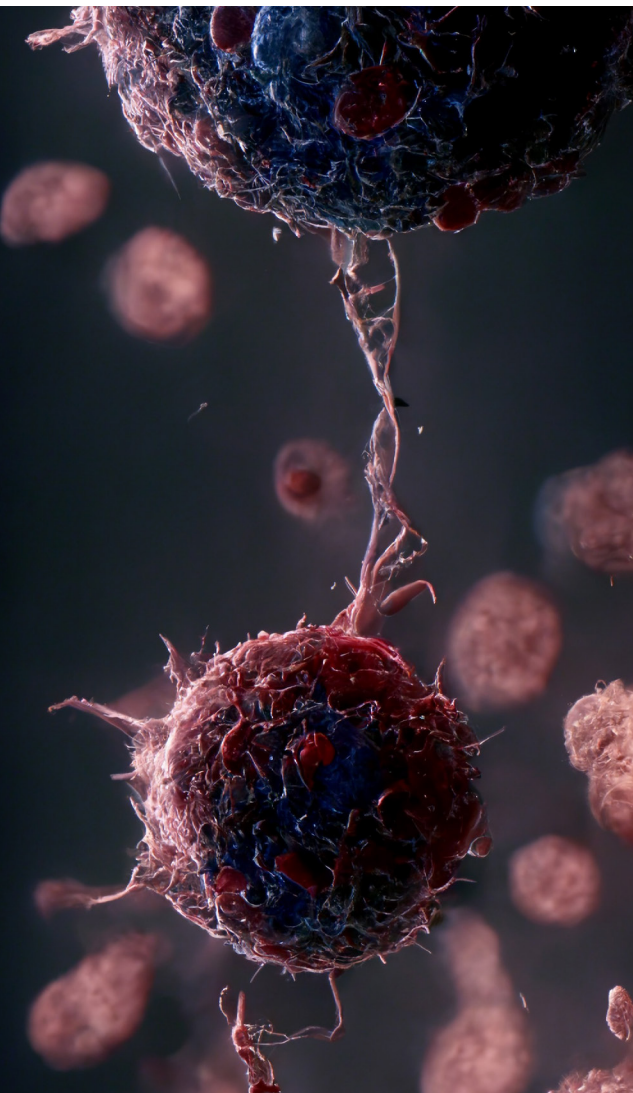
Economist Impact thanks the six experts who shared their insights for this report:

- **Alin Bujan**, board member, European Cancer Patient Coalition
- **Alina Comanescu**, board member, Digestive Cancers Europe
- **Antonella Cardone**, CEO, Cancer Patients Europe

- **James Campbell**, director, Health Workforce, World Health Organisation (WHO)
- **Tonis Metsaots**, oncologist, North Estonian Regional Hospital
- **Rifat Atun**, professor of global health systems, Harvard TH Chan School of Public Health

Economist Impact bears sole responsibility for the content of this report. The findings and views expressed in the report do not necessarily reflect the views of the sponsor nor interviewees. Michael Guterbock and Maryanne Sakai led the research program, with the research conducted by Giulia Garcia, Alcir Santos Neto and Victor Taira Yi. The report was written by Adam Green and copy-edited by Paul Tucker. Rob Cook was the project director.

# Introduction



Cancer incidence is growing worldwide, putting financial pressure on health systems. In 2020 an estimated 18.1m new cancer cases diagnosed. Projections suggest that cancer incidence will increase by 55% by 2040.<sup>1</sup> Although roughly 50% of cancers occur in people aged 65 and older, there was a dramatic 79% rise of cancer cases in patients under 50 years old between 1990 and 2019.<sup>2</sup> This increase was largely associated with behavioural factors, such as smoking, alcohol consumption, and diets high in meat and salt.<sup>3</sup>

New cancer cases rose by 2.3% in Europe between 2020 and 2022, reaching 2.74m.<sup>4</sup> There are geographical variations of incidence and mortality across Europe; in western and northern European countries there is a higher incidence of cancer, but in eastern Europe, mortality is higher.<sup>4</sup> Socioeconomic factors are driving variations between and within countries, with mortality higher in more deprived areas on average.<sup>5,6</sup>

Countries have taken important steps to stem the growth of cancer. Most health systems have now established strategies to improve outcomes. The European Commission has set out a Beating Cancer Plan that includes greater emphasis on prevention, quality of life of survivors, and strengthening access to innovative diagnostics and treatments.<sup>7,8</sup>

A step change is urgently needed. Alongside its devastating human impact, cancer imposes a heavy toll on economies through loss of productivity, unemployment and labour losses.<sup>9</sup> In 2018 total expenditure on cancer in Europe was estimated to be €199bn (US\$216.2bn; 6.2% of total health expenditure), €103bn of which was associated with care-related costs and €32bn spent on cancer drugs.<sup>10</sup> Health systems need to improve the efficiency of spending and find workable and sustainable financing and reimbursement arrangements to lessen the economic toll of cancer. This report assesses the critical factors broadly shaping access and affordability.



# Europe's uneven cancer landscape

There are high levels of inequality in outcomes between and within countries in Europe. This shows how factors beyond the disease itself play a significant role in outcomes, including financing, service design and reimbursement.<sup>11</sup>

Between 1990 and 2016, 3.9m deaths were averted in western Europe owing to factors including improved lifestyle choices and better diagnosis and management. However, in the same period, there was no improvement in mortality in eastern Europe.<sup>12</sup> A 2019 analysis showed that a woman in Sweden has an 86% chance of survival following treatment for breast cancer, while the probability of survival after five years drops to 69% and 66% respectively in Latvia and Lithuania. Similarly, a male in Italy has an almost 90% chance of survival five years after a diagnosis of prostate cancer, while his equivalent in Croatia has five-year survival odds of 71%.<sup>13</sup>

Socioeconomic factors influence cancer risk and outcomes, including which cancers people are vulnerable to. Adults of low socioeconomic status have an increased risk of cancers of the head and neck, esophagogastric, liver and gallbladder, pancreas, lung, kidney, bladder, penis and cervix cancers.<sup>6,14</sup> Tackling Europe's cancer burden, then, requires improvements not just

in medical innovation but also service design, affordability and accessibility that are designed to ensure fair outcomes.

EU countries spent nearly €170bn on cancer care in 2018, with more recent spending figures not available.<sup>15</sup> Per-capita health spending on cancer in 2018 ranged from less than €50 (US\$54) in Bulgaria and Romania to over €500 in Switzerland, and are strongly correlated to GDP per capita.<sup>10</sup> Spending on cancer drugs amounted to €32 billion (€61 per capita) in Europe in 2018. Romania and Poland were the lowest spenders at less than €20 per capita, compared with €90 per capita for the top spenders. Poorer countries spent a higher proportion of their cancer-specific health expenditure on cancer drugs.<sup>10</sup>

Alina Comanescu, a board member of Digestive Cancers Europe, defines oncology accessibility as the ability for anyone to use a product or service. "It doesn't matter where they live, whether in a rural or urban area," she says. New treatments scale three hurdles before patients can access them. Marketing authorisation from the European Medicines Agency (EMA) is granted to confirm a new therapy's quality, safety and efficacy. Countries then determine market access, meaning if and how oncology therapies



will be reimbursed and paid for. Decisions on reimbursement are made based on medical need, clinical effectiveness, cost effectiveness and budget impact. Once reimbursed, patient access occurs—which is when the medicine is prescribed to patients, and adherence is monitored. Both market access and patient access dynamics vary across the continent. In Germany, 98% of all the treatments approved by the EMA are available after authorisation, while for Latvia this stands at 7%—a “lamentable statistic”, says Antonella Cardone, CEO of Cancer Patients Europe.<sup>16</sup>

**“Delivery of information to the least health-literate patients is important.”**

Alina Comanescu, a board member of Digestive Cancers Europe



One factor shaping access is the speed and efficiency of reimbursement processes, for which there are currently large variations across Europe. The average time for a medicine to be approved and reach a patient ranges from 128 days in Germany to 918 days in Romania. The European average is 517 days for all medicines.<sup>17</sup> Even within a country wait times can vary, with some patients getting immediate access and others waiting years. One review found the shortest delay for oncology medicines was 0 days and the longest was 1,120. In Scotland, the variance was 105 days versus 1,337 days; in Spain, it was 132 days versus 1400 days.<sup>18</sup>

There are scant data about treatment adherence after reimbursement, an under-appreciated factor of access.<sup>16</sup> Ms Comanescu uses the term “acceptability”, meaning how likely a patient is to use the prescribed medicine. “If we are talking about vaccines and cancer drugs, there is a great deal of misinformation,” she says. “We know that it is difficult to discern between fake and real news, because we are talking about the least health-literate patients in the EU [in Romania]. It is therefore very difficult to improve adherence to treatments and unfortunately, there are some discontinuities in providing medical services and drugs.” The result might be the cancer patient turning away from particular treatments for fear of losing their hair, for example. “Delivery of information to the least health-literate patients is important,” says Ms Comanescu.

The relationship between health literacy and adherence to treatment is not unique to Romania. In 2021 a systematic review of over 4,000 papers highlighted four studies that investigated this relationship.<sup>19</sup> Higher health literacy was associated with better treatment adherence to oral medications, such as chemotherapy, and other anti-cancer medicines in three of the studies; no association was found



**40%**

When out-of-pocket payments for healthcare exceed 40% of a household's capacity, this is defined as catastrophic spending

in the fourth. Overall, lower health literacy was shown to be associated with greater difficulties understanding and processing cancer related information, poorer quality of life and poorer experience of care. The review revealed that patients undergoing cancer treatment need support throughout the process if they are to understand cancer-related information, ensuring better acceptability and adherence to treatment.

Cancer registries are one measure to help improve understanding of patient acceptability and adherence. "We could have an electronic file for each patient that comprises all their information from diagnosis, staging and protocol suggested for the stage, [as well as] if the patient complies with the whole treatment [or] if they refused the first round of treatment and a recorded reason for this," says Ms Comanescu. "This would be an innovative approach."

### Economic considerations

Economic factors affecting affordability of medications include unemployment, limited income and lack of health insurance coverage.<sup>20</sup> These barriers disproportionately affect lower-income households, who might be further burdened by high out-of-pocket spending in some countries. This forces them to allocate a larger share of their household budget to healthcare.

The term "financial toxicity" refers to the out-of-pocket spending, employment disruptions, loss of productivity and impaired livelihoods that tend to follow a cancer diagnosis. This may lead to skipping treatment doses, mental health distress, loss of employment and even bankruptcy.<sup>21</sup> When out-of-pocket payments for healthcare exceed 40% of a household's capacity, this is defined as catastrophic spending; it varies across Europe from a high of 19% in Bulgaria to a low of 0.8% in Slovenia.<sup>22</sup> Price controls

and reimbursement policies can reduce out-of-pocket payments and improve affordability and accessibility of cancer care.

An example of improved affordability and accessibility of cancer care is demonstrated by Estonia. The country's National Health Fund pays for all cancer care. About 95% of the population is covered by this fund and there are no out-of-pocket payments for treatments in oncology. However, the amount spent is limited depending on the stage of cancer. "There is a limit of €40,000 if the patient has stage IV, metastatic cancer; cancers at earlier stages have a lower limit of €20,000, because the intent is curative and there are more years [gained] per treatment course," says Tonis Metsaots, an oncologist working in Estonia.

The market authorisation process is unified across Europe, but reimbursement decisions are made by individual member states, as each country has different needs, standards of care and budgeting approaches.<sup>23</sup> For some, there is a question not only of the budget impact of reimbursing a treatment, but also the consequence of deciding that the budgeting impact is too high. "If the budget impact is too high, what happens then?" says Rifat Atun, professor of Global Health Systems at Harvard TH Chan School of Public Health. "What are the unintended health consequences of not being able to fund treatment? They may escape the cost of the medication being introduced but that may lead to adverse health and economic consequences."

### HTA and reimbursement processes

Health technology assessment (HTA) evaluates the medical, economic, social and ethical issues related to the use of a health technology, including medicines, medical equipment for diagnostics and treatment, and prevention

### Ethical considerations of health technology assessment (HTA)

Calculations of quality adjusted life years (QALYs—years lived in perfect health, a measure of disease burden) are used to inform policy decisions about healthcare resource allocation, with the lowest cost per QALY traditionally being prioritised under budgetary constraints.<sup>26</sup> This raises ethical concerns around fairness and equity.<sup>27</sup> Some aspects of benefits to patients and society are not captured by QALYs and the patient experience is not accurately reflected.<sup>28</sup>

Patients can provide valuable insights to inform the HTA process, helping to ensure patient-centred care and shared decision-making. This can have positive ripple effects for the rest of a country's healthcare system as well. Antonella Cardone, the CEO of Cancer Patients Europe, thinks that more needs to be done to include patients in the HTA process. "As far as we are aware, Scotland is one country where they pay more attention to the patient's voice," she says. "There are other countries that in one way or another try to involve patients, but they are involved more as an administrative exercise rather than an effective means of getting the patient's voice heard during the process."

methods. It is an important tool for evidence-based policy. However, there is wide variation in HTA processes, which in turn leads to different timelines for factors like reimbursement.

Antonella Cardone, the CEO of Cancer Patients Europe, offers insights on the scale of the differences. "The HTA system in Europe is quite complex because we have 27 member states and 50 HTA bodies. There is no equality for patients, so depending on where they live—which member state they live in or region within a member state—there is no access to certain treatments that could save their life. The odds of their survival depends on where they live in Europe."

Although the approval of novel cancer medicines by the EMA has accelerated in recent decades, granting access to all drugs for all patients is challenging because of the increasingly complex nature of emerging therapies such as cell and gene therapies, the varied clinical benefits of novel treatments, different financing requirements, long-term cost-benefit data, and competing budget priorities. Healthcare is funded differently across Europe through models such as population taxation and various forms of

public and private insurance schemes.<sup>24</sup> Absolute healthcare spending in Europe ranges from €432bn in Germany to €13.7bn in Romania, according to data from 2020.<sup>25</sup>

The decision to reimburse a drug is based on consideration of several criteria, such as the burden and severity of the disease, the relative effectiveness and safety of the new product compared with the usual standard of care or best supportive care, and the cost and economic effectiveness.<sup>23</sup> Other factors might influence the decision to reimburse, such as social value judgements, which assess the effectiveness of the therapy beyond its clinical benefit.

### Affordability

Affordability, one of the main dimensions of healthcare access, is defined by healthcare service prices and provider insurance or co-pays in relation to patient income, capacity to pay and existing health insurance coverage.<sup>20</sup> At the systems level, healthcare affordability is dependent on the ratio of healthcare expenditure to non-healthcare expenditure, with consideration for budget constraints and other forms of coverage. Affordability of oncology



treatments has been defined by Ms Comanescu as the capability of a person to buy it or have the state subsidise it. “An affordable healthcare system leads to accessibility of healthcare service and ends with sustainability,” she says.

There are three key factors that shape affordability and broader system sustainability: prevention, capacity and innovation. New oncology medicines have become more expensive in recent years; when adjusted for inflation, price per life-year gained has risen four-fold in Europe over the past 20 years.<sup>21,29</sup> Pharmaceutical companies cite the cost of research and development, and the creation of value for patients and society, especially considering the shortcomings of conventional treatment regimens, as reasons for higher prices of oncology treatments.<sup>30</sup> However, one study shows a negative correlation between a country in central and eastern Europe’s expenditure for oncology medicines and the mortality-to-incidence ratio, suggesting that when appropriate investments are made, there is a potentially better outcome for patients.<sup>31</sup>

The different price dynamics of some new and emerging oncology medicines can significantly impact affordability and sustainability.<sup>32</sup> Depending on the financial resources available, paying for a drug with limited evidence of effectiveness may not be a cost-effective use of public resources. However, even for treatments that show effectiveness, budget decisions rely on the ability of the payer to pay for them, especially among competing priorities within and beyond health. “Financial stability is one of the biggest differences between each EU country,” says Ms Comanescu. “Since each country has its own health budget and HTA, it is very difficult to tackle the disparities to level the access to cancer services, medical services and cancer treatment, because it involves assessing the ability for health systems to generate and allocate financial resources efficiently. Unfortunately, eastern Europe is not doing as good of a job as western Europe.”

Inadequate funding for new and existing therapies impinges accessibility. In Romania there has been progress in providing access



to new cancer treatments, particularly immunotherapies. But as Alin Bujan, board member of the European Cancer Patient Coalition explains, the country is backsliding. “Unfortunately, right now there are many treatments discontinued due to a lack of funding, with the government not spending on the health system,” says Mr Bujan. “The main oncology centres are not paying for the drugs, and the suppliers refuse to bring treatments to the hospitals. We are struggling with authorities every day to convince them to release funding for treatments.” Romania is one of the EU countries with the lowest health expenditure on both a per-capita and GDP basis.<sup>33</sup>

Mr Bujan further highlights the shortcomings of the Romanian reimbursement system, which utilises price-volume agreements as a reimbursement mechanism. “They created very complicated legislation in an attempt to save money,” he says. “For example, if a treatment needs to be reimbursed it must have the lowest price in the EU. This is not competitive for the pharmaceutical company because the cost for the treatment does not cover logistics and other costs for the company. So they would prefer to sell in Germany or Hungary or Poland, and Romanian patients remain without treatment.”

Similarly, the reimbursement system in Estonia is complicated and lengthy, mostly because of a spending cap of €40,000 per year per patient. Dr Metsaots reveals two different pathways that depend on whether the drug is for outpatient or hospital use, which can take up to two and a half years. “When costs are higher than €40,000 per year per patient, there are discussions about discounts and assessments of efficacy,” he says. “It takes a while, and at the same time patients are waiting for the drugs.”

There are options available for making drugs more affordable. Speaking in the context of Estonia, where the health system is funded by taxpayers, Dr Metsaots believes that an increase in taxes would allow for an increased spending limit. Another option would be to have private insurance, although that would be likely to impinge on accessibility of medicine, as not every patient would be able to afford to pay. “A third option that our health service is trying to pursue is to have more compromises from the pharmaceutical industry, such as more discounts and extra [free] courses of drugs,” he says.

Affordability of cancer therapies cannot be viewed in isolation; a standardised approach to cancer care is needed. “In Belgium, the estimated



**“Right now there are many treatments discontinued due to a lack of funding, with the government not spending on the health system.”**

Alin Bujan, board member of the European Cancer Patient Coalition

benefits of innovative cancer therapy, more specifically immunotherapy, was 27% in life years gained and 34% in QALYs when compared to regular treatments,” says Ms Comanescu. “This [is supported by] a standardised patient pathway, comprehensive cancer centres, tumour boards, telemedicine [and] genomic testing. So, while affordability is important, without a standardised way of treating cancer the results are different. The lack of a standardised system means that it takes them three to four months for a diagnosis, despite the improved affordability. You can have access to affordable treatment, but without the infrastructure to help implement screening, early detection and optimised patient pathways and survivorship packages, the service will still be lacking.”

Ms Cardone is of a similar opinion that health-related costs cannot be viewed in isolation of the broader healthcare system. “We need to consider that the investments made in health have a return that is not necessarily just in health but in the labour market, as people return to work faster, and in the social welfare system,” she says.

### Financial instruments

According to Rifat Atun, professor of Global Health Systems at Harvard TH Chan School of Public Health, there are several instruments that could help health systems to manage costs and financing. One is GDP pricing, in which pharmaceutical companies work with countries to make drugs more affordable. Dr Atun explains the options available to manage cost dynamics. “Pharmaceutical companies may reduce the price—they often do this using reference pricing based on the income of the country, bringing it more in line with the country’s GDP,” says Dr Atun. “Another option is that the payment terms may change to reduce the budgetary impact, such as spreading payments over a period of time. Further options include price-volume agreements, through which price reductions are triggered when certain volumes are achieved. Finally, if pharmaceutical companies can demonstrate that the medicine will work in practice, the payment is predicated on achieving health benefits.” The latter approach is known as outcomes-based payment.

“Incentivising investment in health with an aim to benefitting other departments needs to be looked at.”

“Think about the population health impact,” adds Ms Comanescu. “It is very important that one patient has access to affordable cancer treatments, but the broad impact is on public health because it reduces the burden of the disease, improves survival rates and makes savings. An affordable healthcare system leads to accessibility of healthcare services and ends with sustainable health expenditure and a sustainable health system.”

### Prevention and early detection

According to Ms Cardone, achieving financial sustainability begins with prevention. “Everything starts with prevention, so first there should be more research into the causes of cancer so that we can prevent cancer—this is primary prevention,” she says. “But secondary prevention and screening programmes for early cancer detection are also fundamental.”

Investing in screening programmes provides a significant return on investment. An example of such an investment is vaccination for human papillomavirus (HPV) and national screening programmes for cervical cancer, which are thought to give immediate returns on investment.<sup>34</sup> They significantly reduce preventable illness and death, while also removing the need for expensive treatments that can have serious health side-effects. Ms Cardone explains that the benefits of prevention are not just for healthcare, but also social and economic systems. “If we can save a life, this person goes back to work and would be more productive,” she says. “The benefits are not just for the patient, however, as cancer is a disease that has its impact on the environment around an individual with cancer—carers are impacted as well.”



**“If you have an effective public health programme with a robust system of primary health care, that is what drives reduction in poor health outcomes.”**

James Campbell, director of health workforce at the World Health Organisation (WHO)

The stage at diagnosis of cancer is heavily influenced by access to screening programmes. When cancer is detected at an earlier stage, it can be cured with interventions that cost a fraction of what they would cost at a later stage.<sup>35</sup> Studies conducted in the UK suggest that the cost of treating colon, rectum, lung and ovarian cancers is between £3,000 and £5,000 (US\$3,800-US\$6,350) per patient if the cancer is detected early, while treating advanced disease costs between £12,000 and £15,000 per patient.<sup>35</sup> The research also highlights the vast difference in survival rates between early and late diagnoses—nine out of ten colon cancer patients will still be alive ten years after treatment if caught early, as compared with statistical survival of less than one in ten if it is detected late.

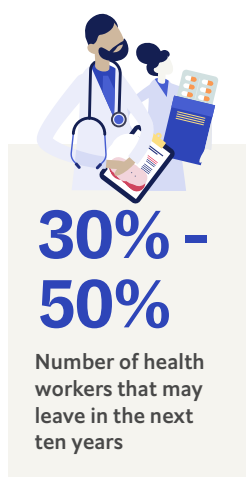
James Campbell, director of health workforce at the World Health Organisation (WHO), says that solutions to easing the burden of cancer link to public health. “You have to come back to prevention, health promotion activities, keeping people healthy and out of the hospital system,” he says. “You have to keep [people] out of becoming that percentage of the population with late access to diagnosis. If you have an effective public health programme with a robust system of primary health care, that is what drives reduction in poor health outcomes.”

Ms Cardone emphasised the need to not just detect cancer sooner, but to detect the right cancer sooner through genomic testing. “This technique is fundamental; it leads to [more] accurate diagnosis, allowing delivery of the most effective treatments, which means not wasting money and energy on trying the wrong treatments,” she says. “It also reduces toxicity for the cancer patient if the right targeted treatment can be delivered from the beginning, rather than moving from treatment to treatment, which is not effective, is more costly and drains the healthcare system. There is a cascade of impacts on the system when early and accurate diagnosis is not possible.”

Ms Comanescu refers to Romania, which has the lowest standardised incidence of cancer but the second-highest mortality rate in Europe. “With lung cancer for example, more than 70% [of cases] are diagnosed in later stages,” she says. “At that point we are no longer talking about a curative approach but rather palliative, and outcomes are poor.”

The country also lacks a screening programme. “We have regulations on papers, but the government does not do any screening,” says Mr Bujan. “The campaigns for screening and disease awareness are done by NGOs and patients.





We just ended a campaign for screening breast and lung cancer in rural areas [covering] 2,000 patients over three months. This was funded by pharmaceutical companies, as the government does not have the workforce to do this.”

### Capacity shortfalls

Workforce size and capacity are important measures of the ability of a healthcare system to cope with the increasing demand for cancer care. Capacity is commonly measured by workforce shortages and vacancy rates. Data on the number of oncologists within a country can be used as an indicator of the supply of oncology care, and data on the number of oncologists in training can predict the future size of the workforce—and the resulting capacity of the system to meet demand.<sup>36</sup>

There is rising demand on health and care services, due in part to ageing populations with comorbidities. “We don’t have enough people to respond to the demand,” says Dr Campbell. “We have high turnover and attrition because of burnout from covid-19, from the working conditions and from the stress we are under. We may be looking at 30-50% of [health workers] leaving in the next ten years. How do we then stimulate the economy so that the education system is graduating more healthcare workers? There is also the other element of migration, and putting all these factors together we have

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**High-income countries need to step up and find a solution, especially the US.”**

Rifat Atun, professor of global health systems, Harvard TH Chan School of Public Health

a scenario where there will potentially be insufficient human capital in the system to respond to need and demand.”

Doctors and nurses are leaving eastern European countries to work in central and western Europe. This flow has continuously increased over the last few years, leading to significant skills gaps in eastern Europe.<sup>37</sup> This westward migration also undermines significant public investment in provider training. The worst hit are patients in rural areas and smaller towns.<sup>37</sup> This needs to be addressed, as quality of care is one pillar of health system sustainability. “A workforce that can provide patients with similar access to medical services [as in western Europe] is needed,” says Ms Comanescu.

Dr Metsaots cites the situation with the medical workforce in Estonia as a challenge to moving forward with oncology treatments. “There are fewer medical students because salaries are higher and workload is lighter in other sectors, so there are fewer doctors willing to do the necessary hours,” he says. “There is also a deficit of nurses.”

The reality is that countries are investing in their best and brightest, incurring massive costs in the process, and not benefiting from their investment when providers leave. “These individuals end up in high-income countries and the benefits are harnessed by high-income countries,” says Dr Atun. “This is highly inequitable and very damaging. High-income countries need to step up and find a solution, especially the US.”

The term “medical desert” is a term used to denote areas of insufficient healthcare due to low numbers of healthcare providers, long waiting times and long distances to travel for care.<sup>38</sup> A recent review found 83 studies describing approaches to mitigating healthcare

workforce issues in medical deserts such as rural areas.<sup>39</sup> In addition to approaches specifically targeting retention of healthcare workers in rural areas, suggestions given in the research included improving professional support, infrastructure, remuneration and on-call agreements, and increasing the availability of allied health professionals.

Other suggestions include devising strategies to better plan and monitor workforce distribution and develop innovative models of care. Innovative models of care include substituting in-person consultations with telemedicine; a more specialised tele-oncology model of care allows cancer patients to receive specialist consultations and chemotherapy closer to home.<sup>40</sup> A study of , another innovative approach to care, showed a substantial improvement in health-related outcomes, alongside fewer visits to the emergency department and fewer hospital admissions.<sup>41</sup>

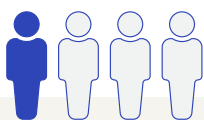
According to Mr Bujan, Romania has somewhat stemmed the migration of specialists to

other countries, but the bigger problem is a lack of resources. “We have very good nurses specialising in oncology, but they don’t have the resources to help them deal with patients and their treatments,” he says. “They are going to conferences, they are educating themselves because the oncology field is very dynamic and they are very good specialists, but they don’t have resources.”

Although specialists may be staying in the country, Ms Comanescu references the negative effect that the exodus of primary care clinicians has on patients. “Due to primary care doctors leaving the country, there is a loss of the first medical services to screen and diagnose cancer in the early stages,” she says. “People are turning to Google or Facebook or other online sources, but it is hard to distinguish scientific truth from misinformation. For the less health literate, this can lead to poor adherence and discontinuation of treatments.”

Discussions about the workforce in cancer care are also incomplete without mention of carers.





## 1 in 4

patients will not receive radiotherapy treatment owing to limited levels of both equipment and trained personnel

Ms Cardone describes carers as a fundamental part of the healthcare system. “We need to look at their productivity at work due to them having to take time off,” she says. “They are often taken for granted and should be rewarded and trained more effectively.” A well-trained carer would be more impactful for the health system and would also know how to safeguard their own safety when, for example, handling drugs that could harm them.

“Carers are the unrecognised support of cancer care, especially in central and eastern Europe,” says Ms Comanescu. “Forty percent of the work is done by carers and with 65% of patients diagnosed in advanced metastatic stages in Romania, this means that extensive treatments and approaches that impact the patient have a direct impact on the carer.” Recognising the load on carers, Digestive Cancer Europe has developed a tool to try connecting carers from Portugal, Poland and Finland to create a support network.

### Innovation

Innovation plays an important role in shaping access and sustainability, by allowing health systems to “do more with less”. Measures of innovation include availability and utilisation of research funding, the rate of IP-generation, and research publications on cancer drugs and novel research. Innovation can also be measured in terms of service design, such as avoidance of non-useful therapies and the rate of waste reduction through strategies such as grouping high-cost therapies on the same day.<sup>36</sup> Innovation, in short, often makes cancer care more financially sustainable and accessible.<sup>42</sup>

There is a need to balance access to existing technologies and approaches with pioneering new approaches. “Looking at something like radiotherapy, which is taken for granted in some

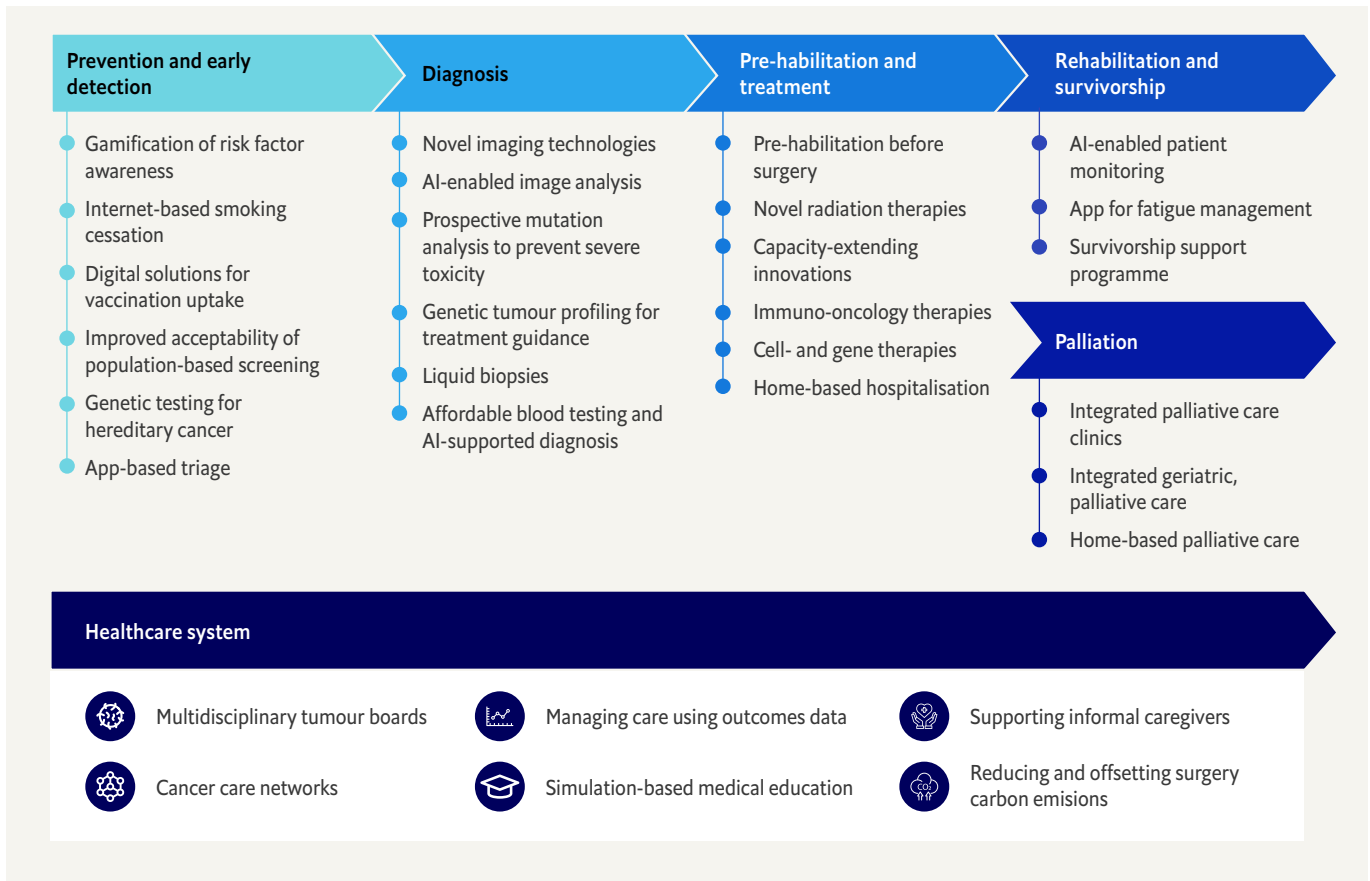
countries such as Italy, the UK, France, Spain and some countries in eastern Europe, it is a technology that is not very well spread and not accessible [elsewhere], partly due to a lack of machines and also lack of workforce capability,” says Ms Cardone.

A study conducted in southeast Europe suggests a combined shortage of 30 radiotherapy machines in some countries. Although the use of technologies like particle therapy and hadron therapy is growing worldwide, there are no particle therapy facilities in the entire southeast Europe area.<sup>43</sup> Such statistics are a stark reminder of the inequalities across the continent. Around 50% of all European cancer patients would benefit from radiotherapy at least once in the course of their disease; yet more than one out of four patients will not receive it owing to limited levels of both equipment and trained personnel.<sup>44</sup>

Cancer care innovations can improve disease management through digital tools and apps. Benefits include raising awareness on reducing cancer risk factors and novel imaging techniques that allow faster and more cost-effective cancer screening (Figure 1).<sup>42</sup> An example is an AI-based programme used to remotely monitor patients with lung cancer that has been shown to reduce the need for regular follow-up appointments in hospital and increase the survival rate of patients from 12 months to 19 months, while reducing the annual average cost of follow up. Patients also reported an increase in quality of life.<sup>45</sup>

Even simple applications such as delivery of home-based care have been shown to make a significant difference. In France for example, an injection that is normally delivered in hospital was delivered at home, resulting in a 20% reduction in cost.<sup>46</sup> A similar attempt in Italy to carry out procedures at home led to a 70% reduction in indirect costs, linked to factors such

Figure 1: Innovations that can be implemented along each stage of the cancer care pathway<sup>42</sup>



as working days lost and travel costs, for both patients and carers. Ninety-eight percent of patients preferred being treated at home, and adherence rates increased.<sup>47</sup>

Some innovative measures focus on prevention, such as genetic testing for hereditary cancers. Women who have the BRCA1 gene mutation are at risk of developing breast and ovarian cancers at a risk of up to 72% and 44% respectively, compared with 12% and 2% respectively among women who do not have the mutation.<sup>48</sup> In the UK, models show that BRCA testing for all women with epithelial ovarian cancer was cost-effective at a threshold of £20,000 (US\$25,350)/QALY.<sup>49</sup> In Estonia, biobank data were used to recontact 180 women carrying any of the genes placing them at risk of breast cancer. This diagnosed six participants that may have been missed or diagnosed at a later stage.<sup>50</sup>

Innovations in pharmaceutical treatments can also help to improve the pricing of cancer therapies and increase the affordability for countries with more limited resources. “Some governments just cannot afford the prices of many medicines being developed,” says Dr Atun. “Smaller companies that don’t have as huge a cost base as the older pharmaceutical companies may be able to reduce the prices and improve the cost-effectiveness thresholds for these medicines. I think this is a real possibility, given the improvements we have in science and technology and the advances in manufacturing. All the processes that lead to attrition in the early stages of research and development will be improved due to artificial intelligence and machine learning. Even the clinical trials will be shorter, so the dynamics will change because there will be more opportunity for disrupting the pharmaceutical market.”



The changing dynamics of the pharmaceutical market include targeted immunotherapy using precision health, better preventative measures such as vaccinations for cancers that have an infectious origin, and gene therapy, for which the science is progressing rapidly. Dr Atun believes that this is due in part to what some countries experienced after covid-19. “The developed [covid-19] vaccines were only available for a few countries and not for several others,” he says. “And other countries like Turkey, China and some Middle Eastern countries are developing the capability to develop drugs. These new players might be able to provide new innovations at a lower price point and will help improve affordability.”

### Measuring Health System Performance

Sustainability metrics provide an objective means for patients and their families to identify high-quality cancer care, for providers to standardise care practices, and for payers to incentivise higher-quality care through alternative reimbursement mechanisms. To build and sustain a high-quality cancer care delivery

system, its members must be able to measure and assess progress, report this information publicly, and develop innovative strategies for performance improvement.<sup>51</sup>

Sustainability metrics need to be devised to allow meaningful comparison both between countries and among different types of cancers. New technologies are emerging regularly, and countries need to keep abreast to offer patients the best, most effective treatments. “Since innovation is so accelerated, the approach [to measuring sustainability] needs to be adaptable, considering different aspects of cancer,” says Ms Comanescu. Her suggestion is for each healthcare system to develop sustainability metrics that enable meaningful co-operation and contribute to continuous improvement in cancer outcomes at both the national and regional levels.

Meaningful co-operation is difficult, as the healthcare sector is a complex landscape with several different stakeholders, each with their own needs, challenges and incentives. A series of domains can be used to create a common language for discussing the elements that need to work together to deliver optimal results to patients. These domains are capacity, the market environment, collaboration and transparency, efficiency, patient-centricity, innovation and productivity, equitable access and use, and outcomes.<sup>36</sup>

A RAND study shows how these domains can indicate health system performance with reference to oncology.<sup>36</sup> From a scorecard, metrics that can be implemented immediately are written in standard font, while those not immediately viable are placed in italics. An example is shown in Table 1 and could provide a framework for measuring performance in central and eastern Europe, depending on data availability.



**Table 1: Scorecard for oncology health system performance**

Capacity	Market environment
<ul style="list-style-type: none"> <li>• Number of oncologists</li> <li>• Number of new entrants in oncology</li> <li>• Total drug revenue</li> <li>• Oncologists' visit capacity relative to demand for oncologist visits</li> <li>• Financial value of research investments by academic institutions</li> <li>• Number of active oncology researchers</li> <li>• Average health literacy of population</li> </ul>	<ul style="list-style-type: none"> <li>• Number of new oncology treatments receiving regulatory approval</li> <li>• Oncology drug prices</li> <li>• Orphan treatments developed and approved per year</li> <li>• Annual venture capital investment</li> <li>• Biotech firm formation levels</li> <li>• Research-active medical staff in oncology practice</li> <li>• Overall population health status</li> <li>• Value to payers, providers and manufacturers</li> <li>• Access to drugs that are not considered clinically effective or cost effective</li> </ul>
Patient-centricity	Market environment
<ul style="list-style-type: none"> <li>• Hematology/oncology (HemOnc) capacity ratio for 350 new patients</li> <li>• Consumer involvement in cancer research</li> <li>• Patient-reported experience measures (PREMs)</li> <li>• Patient activation measure (PAM)</li> <li>• Patient Health Engagement Scale (PHE-scale)</li> <li>• Value for patients</li> <li>• Patient satisfaction with and understanding of information provided to them on their care</li> </ul>	<ul style="list-style-type: none"> <li>• Approvals of oncology new molecular entities (NMEs) and other interventions by the FDA</li> <li>• Proportion of care that reflects latest clinical guidelines</li> <li>• Percentage of research spending used to fund external innovation</li> <li>• Work relative value unit (wRVU) per full-time equivalent (FTE) hematology/oncology physician work relative value unit (wRVU) per full-time equivalent (FTE) Nonphysical practitioner (NPP)</li> <li>• Cost of capital per drug/intervention development</li> <li>• Return on R&amp;D investment</li> <li>• Human health return (on investment terms) per dollar of R&amp;D investment</li> </ul>
Collaboration and transparency	Efficiency
<ul style="list-style-type: none"> <li>• Cancer data capture</li> <li>• Number of pharma-pharma partnerships</li> <li>• Number of people participating in clinical trials each year</li> <li>• Partnerships between academic researchers and community clinicians</li> <li>• Quality Oncology Practice Initiative participation and performance</li> <li>• Data sharing from clinical trials</li> <li>• Data sharing and standardization across care providers</li> <li>• Patient satisfaction with and understanding of information provided to them on their care</li> <li>• Ability of patients to share their data for research purposes</li> </ul>	<ul style="list-style-type: none"> <li>• Number of new interventions brought to market per billion US dollars of R&amp;D spending</li> <li>• Cycle time: period of time in clinical development for a new intervention</li> <li>• Physician work relative value units (wRVUs).</li> <li>• Costs of cancer care</li> <li>• Proportion of care and R&amp;I costs allocated using evidence-based prioritization methods</li> <li>• Time from diagnosis to surgery or first treatment</li> <li>• Time from presentation to primary care practitioner (PCP) to initial testing</li> <li>• Overall time from first protocol submission to final medicines regulatory approval</li> </ul>

**Table 1: Scorecard for oncology health system performance (cont.)**

Equitable access and use	Outcomes
<ul style="list-style-type: none"> <li>• Percentage of population under 65 without health insurance (by geography, race, sex, age, sexual orientation, marital status)</li> <li>• Number of oncology specialists per 100,000 population (by state/region)</li> <li>• Number of research-active hospitals (per 100,000 population, geography)</li> <li>• Proportion of adults receiving cancer screening based on the most recent guidelines (by geography, sexual orientation, race, age, family type, country of birth)</li> <li>• Access to clinical trials (by gender, race, age, geography, socioeconomic status)</li> <li>• (Relative) survival rates (by cancer type, geography, demographic characteristics)</li> <li>• Stage of diagnosis (by geography, demographics)</li> <li>• Variation in quality of care indicators (by census division, race, hospital type)</li> <li>• Percentage of patients treated according to NCCN guidelines (by geography, sex, race, income)</li> <li>• Trust in practitioners and information provided</li> <li>• Availability of information tailored to needs and health literacy</li> </ul>	<ul style="list-style-type: none"> <li>• Prevalence and mortality rates</li> <li>• Disease-free survival (DFS) or progressive-free survival (PFS), median overall survival (OS), recurrence rate and quality of life</li> <li>• Patient-reported experience measures (PREMs)</li> <li>• Patient activation measure (PAM)</li> <li>• Patient Health Engagement Scale (PHE-scale)</li> <li>• Value for patients</li> <li>• European Quality of Life-5 Dimensions (EQ-5D)</li> <li>• ASCO value framework: clinical benefit score and toxicity state</li> <li>• Wider health status during and following treatment (eg, mental health)</li> <li>• Financial status and security of patients during and after treatment</li> <li>• Social, emotional and relationship status of patients during and after treatment</li> </ul>



# The way ahead

The global increase in cancer incidence is putting pressure on healthcare systems and economies, increasing expenditure on cancer care, loss of productivity and unemployment. This report explores these trends in Europe, with a deep dive of country case studies, to understand and address the key factors shaping financial sustainability, affordability, accessibility and equity across the care pathway for oncology.

Across the continent, there are significant differences in terms of preventive measures, risk factors, prevalence, access to therapies and patient outcomes. The speed with which

new therapies are financed and reimbursed are key areas of divergence, affecting accessibility and equity across countries. These differences suggest that patient outcomes will differ depending on where they are treated.

A series of factors have been identified as relevant to improve the situation. The first is the need for governments to invest in health, as it has a significant return for economies and society. Needed investments include public health prevention and screening campaigns that would lead to early detection of cancers, and advanced diagnostic measures such as genomic testing that would improve treatment and patient outcomes. Ultimately, these investments benefit society at large and prove more cost-effective than the costs of advanced oncological treatments at advanced stages of disease.

A second factor is that sustainable oncology care requires a balance between accessibility and financial sustainability. With the rising incidence of cancer comes increased pressure on healthcare budgets; this pressure needs to be managed in innovative ways to ensure access to existing treatments is maintained and access to effective emerging therapies is widened. Some approaches to finding the balance between accessibility and financial sustainability include



different pricing and payment methodologies for oncology therapies, alongside other approaches that can be focused more on non-cost-based changes. Improvements do not have to require increased spending; streamlining reimbursement processes, standardising care pathways and including the patient voice in decisions can all make a difference.

A third factor for follow-up relates to the worrying loss of the healthcare workforce, particularly from countries in eastern Europe. Burnout, the attraction of better paying professions and emigration to places like western Europe and the US have led to an outflow of medical talent, causing countries to lose the return on their investment of training skilled workers. The result is poor accessibility in some

areas of these countries and longer waiting times for treatment. Measures to retain healthcare staff are necessary, and technology could help to improve access in neglected areas through automation and telemedicine.

Again, cancer outcomes are not predetermined; they can be influenced by policy choices and system design. The key factors likely to improve outcomes include flexible financing arrangements to ensure equitable access to appropriate therapies; harnessing technology to improve service efficiency; investing in prevention; and efficient and effective approvals and reimbursement processes, especially for effective emerging and novel cancer therapies. Change is urgently needed, but there is hope and opportunity.

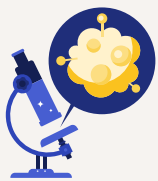
# Country profiles

This section gives an overview of cancer care and health system sustainability in Sweden, Estonia, Romania and Poland, with specific focus on progress made in the areas of prevention and screening, investments and digital innovation.



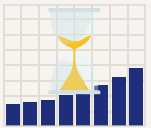
## SWEDEN

The estimated incidence of cancer in Sweden was 557 per 100,000 in 2020, slightly lower than the European average of 569 per 100,000. Cancer mortality is among the lowest on the continent, and is trending downwards for most common cancers.<sup>52</sup> Sweden spends more of its GDP on health compared with the rest of the world, and cancer care costs are 3.7% of the total health spend.<sup>53</sup> In 2023 the Swedish government announced that it wants to invest more in cancer and paediatric cancer care, with Skr500m (US\$47.7m) proposed annually.<sup>54</sup>



### Progress made in screening and prevention

Great progress has been made in cancer treatment, but more focus has been given to preventive efforts to produce the greatest gains in saving lives in Sweden. Some examples of these efforts are vaccination of girls and boys in Grade 5 against human papillomavirus (HPV), the virus that causes cervical cancer; physical activity on prescription for at-risk patients; and innovative models for procurement, reimbursement and social outcome contracts for investment in prevention and early intervention. The public sector is involved in both financing and implementing these programmes.<sup>55</sup>



### Sustainable investment

In 2015 the Swedish government introduced a four-year national cancer reform programme called Standardised Cancer care Pathways to standardise cancer treatment, with aims that included shorter waiting times for patients with suspected cancer, increasing patient satisfaction and reducing regional inequalities.<sup>56</sup> Each county was incentivised to implement the programme with a performance-based reward grant of Skr2bn (US\$190.9m). The focus of the programme was on the initial diagnostic phase and the pathway ended for each patient when treatment is initiated; their subsequent care is conducted as normal. Patients were generally satisfied with the process, but clinicians reported challenges such as lack of capacity.

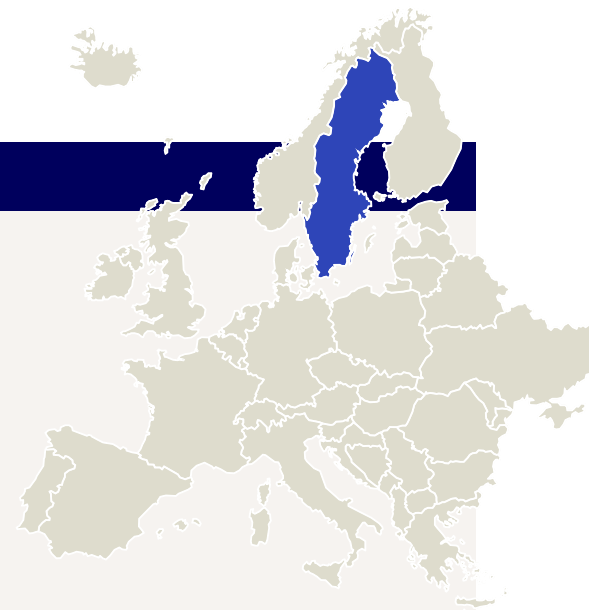
The Swedish government is also making large investments in precision medicine. Gene sequencing, and, more specifically, next-generation sequencing can be used to determine the specific genomic fingerprint of a cancer by getting DNA from tumour cells, allowing a patient to get the best treatment for their specific cancer. Gene sequences are held in a database, along with data about treatment options that were effective for other patients with the same sequence. This also means that ineffective treatments are not trialled, preventing delays to the correct treatment pathway. If implemented correctly, precision medicine has the capacity to prevent, manage and treat cancer effectively.<sup>57</sup>



### Digital innovation

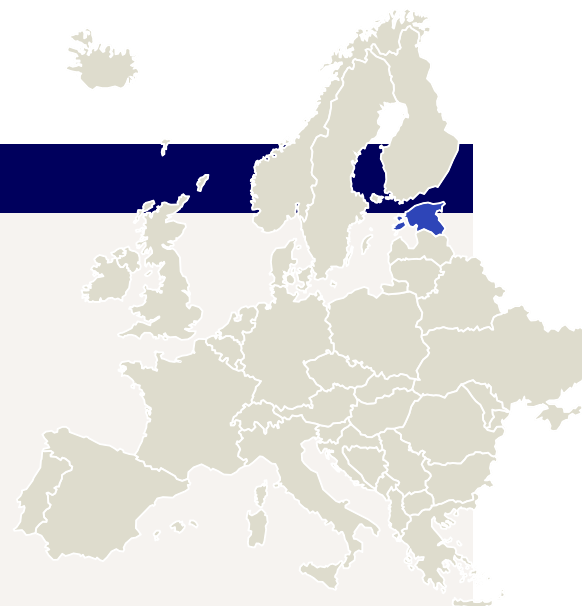
Digital tools are increasingly used for early detection and decision support. For example, the Skåne and Stockholm regions both use a teledermatology platform, where doctors can document and photograph skin changes with a mobile phone and send them to dermatologists for assessment and diagnosis of skin cancer.<sup>55</sup> Sweden is also developing digital pathology, which is more accurate and enables the use of image analysis and artificial intelligence.<sup>58</sup>

Registries are a store of data with the potential to provide important information on healthcare patterns, decision-making and delivery, and the effect of those factors on patient outcomes.<sup>59</sup> Sweden's cancer registry was established in 1958, and it tracks incidence and changes in cancer over time. This registry is known to be of high quality, making it a robust data source for research and information on the care pathway and utilisation.<sup>60</sup> Sweden has invested heavily in data registries, with over 90 in existence, storing vast amounts of information.<sup>61</sup> One example is the Swedish Childhood Cancer Registry, in existence since the 1970s. Sweden has the highest childhood cancer survival rate in Europe (80%). The country's health system has embraced electronic reporting, interconnectivity and digital technology to facilitate data collection and reporting from healthcare and diagnostic units.



## ESTONIA

Despite being a well-developed economy, overall incidence of cancer in Estonia is higher than the average for the EU. In 2020 the expected age-standardised rate of cancer incidence was 576 cases per 100,000, compared with the EU average of 569 cases per 100,000.<sup>62</sup> When compared to Nordic and western European countries, cancer is more often found in advanced stages, with only 50-60% of the eligible populations taking part in screening programmes.<sup>63</sup> Possible shortcomings in early detection have been noted with colorectal cancer management, for example, where an increase in emergency surgeries has been noted, despite improvements with diagnosis, staging and treatments.<sup>64</sup> In recent years national initiatives have led to an improvement in these numbers. One example is the use of mobile mammography units that have increased breast cancer screening participation from 65% to 70%.<sup>63</sup>



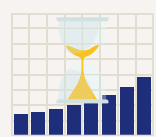
### Progress made in screening and prevention

Since 2007, Estonia has introduced two key strategies to tackle the burden of cancer.<sup>62</sup> The National Cancer Strategy, covering 2007-15, and the Cancer Control Plan, covering 2021-30. The first achieved important goals such as an improvement of cancer survival rates. However, with several targets left unmet, the second strategy was introduced with nine priorities related to cancer prevention, early diagnosis, access to high-quality treatment for all, and ensuring high-quality care and follow-up for cancer patients in line with Europe's Beating Cancer Plan.<sup>65</sup>

National screening programmes exist for breast, cervical and colorectal cancer, although screening of target groups was less than 60% for breast cancer and less than 50% for cervical cancer. Coverage rates for male and female colorectal cancer screening were 50% and 60% respectively; coverage decreased in 2020 owing to the covid-19 pandemic.<sup>66</sup>

Survival rates for the most common cancers improved in 2004-14 owing to a high quality of care provided at specialist centres. Estonia plans to improve the quality of care further by systematically monitoring adherence to guidelines. This will also allow for standardised quality of care across healthcare providers at all levels.<sup>67</sup> When compared with the rest of Europe, cancer is often diagnosed in later stages in Estonia, which is one of the reasons why survival rates are lower than in some other countries. For example, five-year survival for breast cancers diagnosed in 2012-16 was 80%, compared with 90% in nearby Finland.<sup>62,68</sup>

In 2018, Antegenes, an official spin-off of the University of Tartu was founded. Antegenes is an innovative health technology company that has developed novel genetic tests that help to clarify a person's genetic predisposition to cancer, allowing for more efficient prevention and early detection measures.<sup>69</sup> The tests are currently used to determine the genetic risk of four types of cancer: breast, prostate, colon and skin melanoma. The company is funded by grants and seed investors.<sup>70</sup>



### Sustainable investment

Increased attention has been given to prevention of modifiable risk factors of cancer. Nearly half of all deaths in Estonia are a result of behavioural or modifiable risks, which is above the European average of 39%.<sup>67</sup> Healthcare expenditure on prevention grew from 2.9% to 4.8% between 2014 and 2020, above the EU average of 3.4%. This included policy actions on alcohol consumption, tobacco policies, and national dietary and physical activity guidelines.<sup>62</sup>

Financial reports suggest that funding dedicated to cancer care rose from 12% to 16% of the total budget for specialised health care between 2019 and 2020, mainly driven by increased spending on cancer drugs.<sup>62</sup>



### Digital innovation

Estonia is a leader in eHealth, and is the first country in Europe to use ePrescriptions that can also be fulfilled in pharmacies in Finland, Croatia, Portugal and Spain.<sup>71</sup> Nationalising electronic health records (EHRs) and ePrescriptions create a foundational infrastructure to allow for the interconnecting of other digital innovative solutions, such as remote patient monitoring and digital therapeutics.<sup>72</sup> Estonia's national Health Information Systems is thought to be one of the oldest EHRs in Europe.<sup>73</sup> Launched in 2008, it aims to incorporate a countrywide digital record that is accessible to almost all Estonians, based on blockchain technology that maintains the integrity of the data.

The Estonian Cancer Registry has maintained a database of cancer cases since 1968, improving over the years owing to rapid improvements in computer technology.<sup>74</sup>



## ROMANIA

The overall incidence of cancer in Romania is lower than the European average by 10% for men and 16% for women. Yet cancer mortality is 7% higher than the EU average, based on an increase in deaths for six cancer types between 2000 and 2019.<sup>75</sup> Within the Romanian healthcare system, there are challenges that include insufficient funding, a shortage of medical personnel and poor provision of services.<sup>76</sup> In 2020 healthcare spending was estimated at 6.3% of GDP, below the European average of 10.9%. Lung cancer represents the most common cause of death from cancer (3.9% of all cancer deaths).

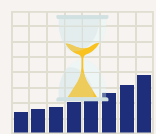
Despite the country's suboptimal performance, Alina Comanescu, a board member of Digestive Cancers Europe, reports that there are some things that Romania is doing well that other countries could learn from. The country has already enforced the new HTA and clinical trial regulation directive, which has eased the bureaucracy around the clinical trials approval process. The country is also trying to foster innovation and involve the patient voice in a multi-stakeholder approach to integrated cancer care.



### Progress made in screening and prevention

An analysis of policy documents issued between 2001 and 2016 shows that Romania's current cancer policies focus more on treatment and screening, and less on prevention, surveillance, research and rehabilitation. Since 2001 the country has provided support for cancer patients through its national programme for cancer.<sup>77</sup> The plan includes programmes aimed at reducing the incidence and mortality of cancer while improving the health of the at-risk population and quality of life for cancer patients.<sup>78</sup>

There is a lack of screening and participation rates are low. In 2014 25% of women aged 20-69 reported being screened for cervical cancer, 9% of women aged 50-69 reported being screened for breast cancer and 5% of people aged 50-74 had been screened for colorectal cancer at least once in their lives. These numbers compare to EU averages of 62%, 57% and 47% respectively.<sup>79</sup> In 2018-19 Romania invested in new cancer screening programmes to strengthen prevention, although per capita spending on prevention is the second lowest in Europe.



### Sustainable investment

The overall negative impact of cancer prevalence in Romania for patients diagnosed each year is approximately €3.4bn (US\$3.68bn) in the year after diagnosis. However, research shows that prevention strategies, alongside improved diagnosis and treatments, could lead to economic gains of between €1.62bn and €2.4bn in the first ten years.<sup>80</sup>

Cancer drug expenditure is nearly 50% of cancer health expenditure, driven by high late-stage diagnosis of cancer. Funds for cancer medicines allocated by the National Health Insurance House increased from €173m (US\$187m) in 2010 to over €633m in 2021, mostly driven by increased use of targeted therapies and immunotherapies.<sup>75</sup> Romania needs to prioritise access to innovative therapies while developing quality assurance of cancer care and expanding capacity for early detection and prevention. Ultimately, this will foster financial sustainability in the health sector.



### Digital innovation

Romania has taken significant steps in integrating data across electronic health records (EHRs). In 2014-21 over 16m EHRs have been created in a country with a population of 19m.<sup>81</sup> The records allow patients to see who has accessed their data and when it was accessed, and to anonymise and choose the data their doctors have access to. It is regulated by law. A further effort to improve the eHealth sector is RegInterMed, a project costing €14m (US\$15.1m), €12m of which came from the EU's European Regional Development Fund.<sup>82</sup>

RegInterMed aims to provide an IT platform for at least 100 electronic health registries and progressively update the data of patients enrolled in those registries.

## POLAND

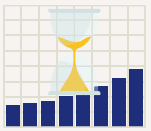
Cancer is the second leading cause of death in Poland. Although incidence of cancer is low in comparison to other European countries, mortality and survival ratios are worse than Europe's average.<sup>83</sup> Overall cancer mortality was 15% higher than the EU average of 247 per 100,000 in 2019, despite incidence rates that were 5% and 3% lower than the EU for men and women respectively.<sup>84</sup> Poland's health system is based on universal social health insurance that covers almost all residents.<sup>85</sup> Recent reforms have focused on improving organisation of care for key health problems such as cancer. Presently, the country fully reimburses over 60% of novel oncology therapies, and the National Health Fund supports the use of more than 100 authorised novel agents.<sup>86</sup>



### Progress made in screening and prevention

There are screening programmes for breast, cervical and colorectal cancers, but participation of target groups is low, at 16%, 20% and 40% respectively.<sup>87</sup> Poland was the second country in Europe to implement a nationwide screening programme for lung cancer, doing so in 2020. A population-based cervical screening programme was implemented in 2006, and has led to a decrease in deaths from cervical cancer; however, screening rates are low in comparison to other European countries, and the screening procedure is carried out in gynaecologist's offices rather than in primary care.<sup>88</sup>

A breast cancer screening programme was implemented in 2007 and has had a positive impact; those participating in the screening have their cancers diagnosed at less advanced stages compared with those not participating, although efforts need to be renewed owing to breast cancer being a serious epidemiological problem in Poland.<sup>89,90</sup> Compared with other European countries, the participation rate in colorectal cancer screening in Poland is also much lower. A 2019 study showed that only 17% of the population in Poland opted to participate in early colorectal screening, compared with 68% in the Netherlands and 65% in Denmark.<sup>91</sup>



### Sustainable investment

Poland has recognised the need to improve the organisation of cancer care in areas such as reducing waiting lists for both diagnostics and treatments. On January 1st 2015 the country implemented a controversial oncological therapy fast-track known as the oncological package, which led to significantly shortened diagnostic and treatment times.<sup>92</sup> The oncological package also aimed to abolish financing limits on the coverage of services provided in the pathway, a move that led to a substantial increase in spending, from €1.6bn (US\$1.73bn) in 2014 to €2.2bn in 2019.

The shortcomings of the oncological package led to calls for a second organisational change. As a result, the National Oncology Network began piloting care pathways for cancer at five sites in 2019.<sup>97</sup> Drawing on experiences from the UK, Norway, France and other European countries, it aims to improve prevention, early diagnosis and quality of treatment across all areas of the country, a move that would require standardisation of care pathways, expertise in highly specialised procedures and quality monitoring.

Out-of-pocket spending in Poland is high, representing 20% of total health expenditure in 2019, compared with the EU average of 15%.<sup>84</sup> The country has adopted a risk-sharing approach to pharmaceuticals, which means that the public healthcare system and pharmaceutical companies share the financial risk of failed treatment for innovative drugs. This has lengthened the process of drug authorisations, leading to delays, but innovative cancer treatments are more accessible overall, and the efficiency of public spending on these treatments has improved.<sup>84</sup>



### Digital innovation

E-health has been recognised as playing a pivotal role in meeting health priorities. Poland has initiated an eHealth Development Programme, focusing on enhancing primary care with e-health solutions as part of the goals of the national strategy, known as the Healthy Future Strategy framework. The strategy outlines the goals that Poland is utilising to progress its medical infrastructure, and it establishes new benchmarks, goals and preferences for the financial, societal, health and geographical growth of its population.<sup>93</sup>

eHealth services developed rapidly during the covid-19 pandemic, taking advantage of the Patient Internet Account Electronic documentation of medical records, which was introduced in 2019. E-prescriptions were introduced from January 2020 and in the following year e-referrals were used in some facilities.<sup>84</sup>



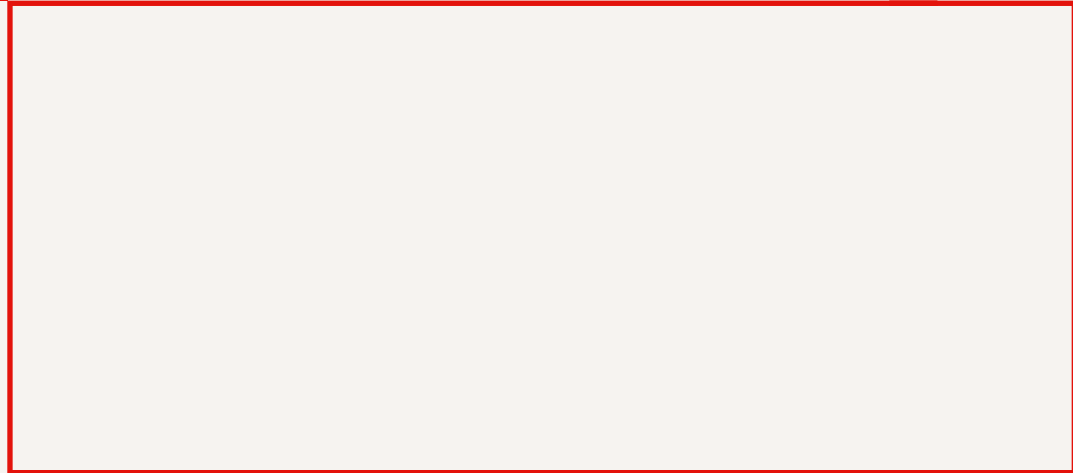
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