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Cancer Dashboard for Croatia

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THE SWEDISH INSTITUTE FOR HEALTH ECONOMICS
ENABLING INFORMED DECISION MAKING

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Purpose

In 2023, the Swedish Institute for Health Economics (IHE) launched an international initiative with support from MSD, aiming to facilitate the exchange of best practices in cancer care across European countries. This initiative is called "*Cancer Dashboards in Europe*". It has its background in the launch of the Europe's Beating Cancer Plan and the question of how to translate political commitment into action. The objective is to create country-specific dashboard-style reports with a comprehensive and illustrative description of a selected set of key indicators in all areas of cancer care. These indicators benchmark the current status quo in a country against target values specified in national cancer plans, targets set by international organizations, or values of other countries. The reports also provide evidence-based recommendations on how to improve the current situation in a country.

This dashboard report for Croatia focuses on cancer in general. It is intended to reinforce the implementation of the National Cancer Control Plan and other ongoing initiatives to improve cancer care in the country. The description seeks to support Croatian policymakers in the decision-making and prioritization of initiatives in cancer care. The dashboard is intended to be a living document, which can be updated when newer data become available. It can also be extended to additional areas and indicators that become relevant based on developments in Croatia or the EU.

Contents

Prepared by IHE – The Swedish Institute for Health Economics

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Foreword

Cancer remains one of the leading public health challenges in Croatia, placing a growing burden on patients, families, and the healthcare system as a whole. While important progress has been achieved over the past decade, demographic change, rising incidence, and increasing complexity of cancer care continue to test the resilience and performance of the system. Addressing these challenges requires sustained commitment, strategic planning, and the systematic use of evidence to guide policy and investment decisions.

In this context, the **Cancer Dashboard for Croatia**, developed by the Swedish Institute for Health Economics (IHE), provides a comprehensive and timely assessment of cancer care across the full continuum – from prevention and early detection to treatment, outcomes, research, and system financing. By drawing on national and international data sources and benchmarking Croatia against European peers, the report offers a clear and transparent overview of current performance, highlighting both achievements and areas where further improvement is needed.

The findings of this report align closely with the priorities set out in Croatia's **National Cancer Control Plan 2020-2030**. In particular, they underscore the importance of strengthening prevention and screening, ensuring timely and equitable access to diagnostics and treatment, addressing workforce and organizational constraints, enhancing clinical research activity, and improving data availability to support quality assurance and long-term planning. The report also highlights the critical role of sustained investment in infrastructure and technology as a foundation for high-quality cancer care.

Significant progress has already been made in this regard. For example, the recent expansion and modernization of radiotherapy capacity – supported in part through investments from the National Recovery and Resilience Plan – represents a major step forward in improving access to modern cancer treatment and reducing regional disparities. These achievements demonstrate what can be accomplished when strategic vision is matched with targeted funding and coordinated implementation.

This report provides an important evidence base to support the next phase of cancer system strengthening in Croatia. By translating data into actionable insights, it can help inform policymakers, clinicians, and other stakeholders as they work together to improve outcomes, enhance equity, and ensure the sustainability of cancer care in the years ahead.

We commend the authors for delivering a rigorous and accessible analysis and hope that the insights presented in this report will contribute meaningfully to continued progress in cancer prevention, care, and control in Croatia.

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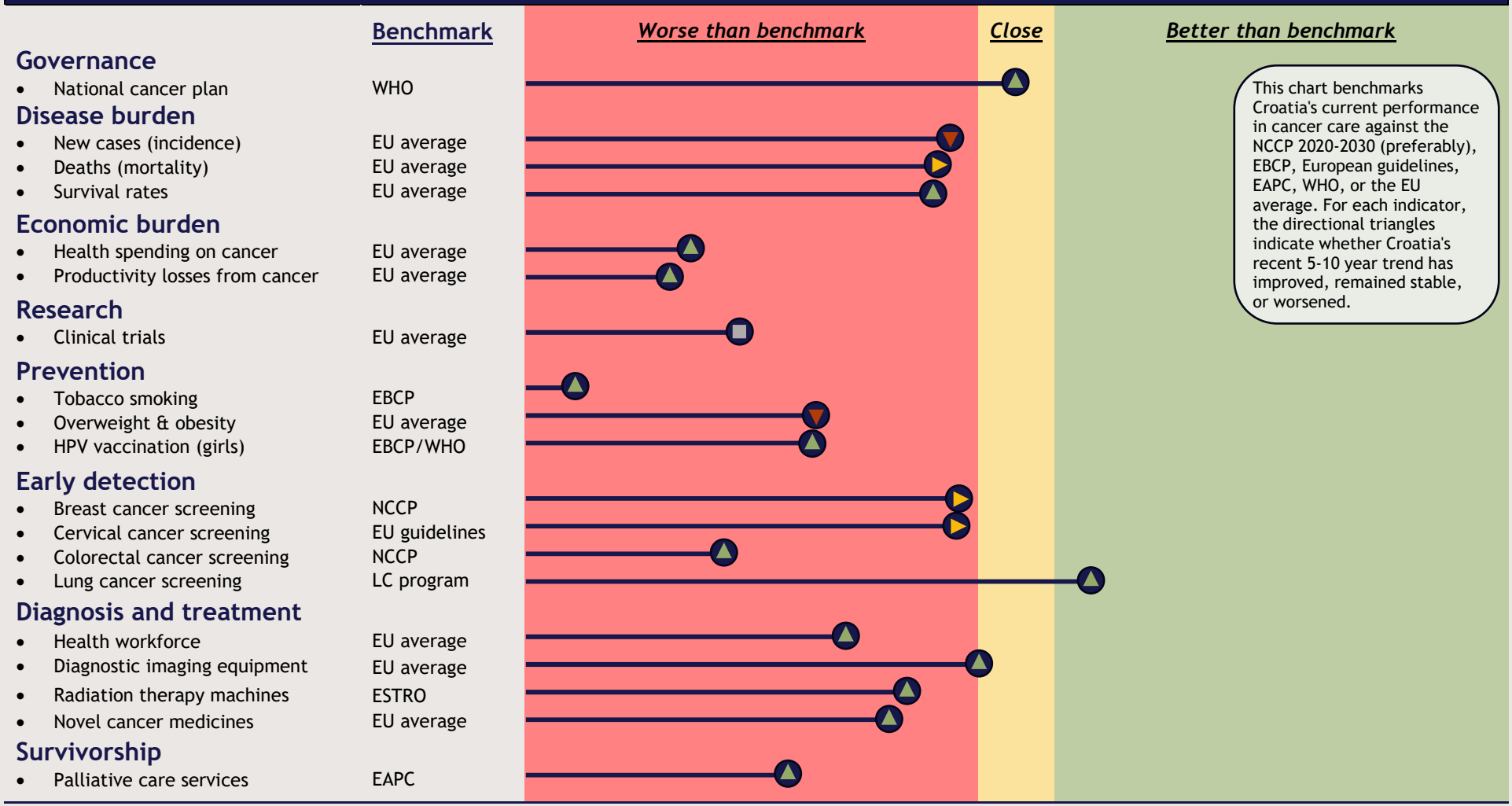
Dashboard overview Croatia

Comparative Performance: Croatia vs. Benchmark



Legend: Positive development, Stable development, Negative development, No data or not applicable

Abbreviations: EAPC = European Association for Palliative Care; EBCP = Europe's Beating Cancer Plan; ESTRO = European Society for Radiotherapy and Oncology; EU = European Union; LC program = National Lung Cancer Screening Program; NCCP = National Cancer Control Plan; WHO = World Health Organization.
Notes: All indicators are defined in % or per capita terms; see the main text for a detailed description and the Appendix for the exact definition used.

High-level recommendations

Governance

- ✓ Ensure that the National Cancer Control Plan 2020-2030 continues to be implemented with adequate funding, monitoring of key performance indicators, coordination across stakeholders, and political commitment to achieve defined targets and to take into account newer targets defined at the EU level in Europe's Beating Cancer Plan and relevant Council recommendations.

Funding

- ✓ Prioritize investment in high-impact areas such as early detection, diagnosis, access to novel therapies, and care coordination, which will also help to reduce the high indirect costs of cancer.
- ✓ Invest in better monitoring systems with timely data, capturing outcomes through the National Cancer Registry, expenditure by the HZZO, and process indicators (waiting times, treatment patterns, etc.).

Research

- ✓ Strengthen cancer research and attract clinical trials through a simplified legal framework and more attractive incentives to conduct trials.

Prevention

- ✓ Strengthen tobacco and obesity control through higher taxation on relevant products, anti-smuggling measures for cigarettes, and awareness campaigns to promote healthy lifestyles.
- ✓ Increase HPV vaccination coverage using digital reminders and e-consent systems, and consider changing the legal status in line with other childhood vaccines, which would aid monitoring efforts and enable targeted, data-driven interventions.

Early detection

- ✓ Increase screening participation through targeted awareness campaigns and GP involvement, especially in low-uptake regions, and consider encouraging cross-referrals from one screening program to another.
- ✓ Expand screening eligibility (age groups) and modernize screening methods (HPV tests, self-sampling kits, FIT) in line with EU recommendations.

Diagnosis and treatment

- ✓ Recruit and retain oncology staff, especially nurses and rural practitioners, through better incentives and work conditions.
- ✓ Invest in diagnostic and treatment infrastructure – especially PET scanners, AI-assisted analysis, brachytherapy – and ensure a more equitable regional distribution along with optimized workflows.
- ✓ Improve access to new cancer medicines by aligning national HTA processes with new EU frameworks and by monitoring prescribing patterns at hospital level to allow for quality improvements.

Survivorship

- ✓ Continue the successful expansion of palliative care through establishing additional services and adequate workforce.

Background

IHE Cancer Dashboards

Cancer has received growing political attention across the European Union (EU) in recent years. The launch of Europe's Beating Cancer Plan (2021) by the European Commission reflected a strengthened commitment to addressing the burden of cancer in a more systematic and coordinated way (1). Across the EU and in Croatia, cancer is the second-leading cause of death in both men and women, responsible for more than one in five deaths (2). Substantial inequalities in cancer care persist, both between and within EU countries. A key challenge lies in translating international and national initiatives into action: while the policy landscape is rich in ambition, it often lacks funding and clear and practical tools to support implementation, guide prioritization, and monitor progress at national and/or regional level.

To help bridge the gap between policy plans and action, the Swedish Institute for Health Economics (IHE) has developed a series of national Cancer Dashboards since 2023 for countries such as Austria, Denmark, Greece, Italy, Lithuania, Poland, and Portugal. These dashboards provide an intuitive and structured overview of how countries perform in cancer care. By combining data, benchmarking, and evidence-based recommendations, they offer policymakers and stakeholders actionable insights, highlighting where progress is being made, where efforts must accelerate, and where strategic investment is required. Ultimately, each dashboard serves as a navigation tool to support the planning, implementation, and evaluation of effective, equitable, and outcome-oriented cancer control.

While some dashboards cover specific types of cancer, others provide a general overview of cancer care. Building on this work, this dashboard focuses on cancer care in Croatia.

Structure of the dashboard and choice of indicators

This report begins with an overview of Croatian and European governance frameworks relevant to cancer, including Croatia's National Cancer Control Plan (NCCP) and Europe's Beating Cancer Plan (EBCP). It then provides an analysis of the disease burden and economic burden of cancer, highlighting the impact of the disease on patients, the healthcare system, and society at large. These contextual elements set the stage for understanding the urgency of national-level action. The report then follows mostly the cancer care pathway, structured around the four pillars of the EBCP together with a focus on research as it was included in the NCCP. Together, the dashboard presents a comprehensive view of the current status of cancer management in Croatia.

The dashboard is structured as follows:

- **Governance** (1 indicator): National cancer plan
- **Disease burden** (3 indicators): New cases (incidence), deaths (mortality), survival rates
- **Economic burden** (2 indicators): Health spending on cancer care, productivity losses from cancer
- **Research** (1 indicator): Clinical trials in oncology
- **Prevention** (3 indicators): Tobacco smoking, overweight & obesity, human papillomavirus (HPV) infection
- **Early detection** (4 indicators): Screening for breast, cervical, colorectal, and lung cancer
- **Diagnosis and treatment** (4 indicators): Health workforce, diagnostic imaging equipment, radiation therapy machines, novel cancer medicines
- **Survivorship** (1 indicator): Palliative care services

The starting point for the selection of indicators was the original list of indicators assembled by IHE for the European Cancer Pulse of the European Cancer Organisation (3). The final set of indicators was selected based on discussions with Prof. Eduard Vrdoljak and Prof. Stjepko Pleština, MSD Croatia, and local data availability.

For each indicator across the cancer care pathway, this report provides:

- A general explanation of its relevance, and how it relates to the NCCP and the EBCP
- A description of the current situation in Croatia, with international comparisons
- Recommendations for improvement and alignment with national and international targets

Data sources for all indicators are summarized in the Appendix. All data were drawn from publicly available sources.

Benchmarking is conducted internationally to provide relevant reference points against Bulgaria, Romania, Slovenia, Sweden, and the EU average, whenever data are available.

Governance

In 2017, the World Health Assembly (the decision-making body of the World Health Organization, WHO) adopted resolution WHA70.12 on cancer prevention and control (4). It calls on governments to commit themselves to accelerating action against cancer. Specifically, it urges governments to develop and implement national cancer control plans that are inclusive of all age groups, that have adequate resources, monitoring and accountability, and that seek synergies and cost-efficiencies with other health interventions.

Croatian National Cancer Control Plan 2020-2030

The National Cancer Control Plan (NCCP) for the years 2020 to 2030 is a comprehensive multiannual program which includes the following visions to be achieved for multiple strategic areas (5). These visions are supported by concrete objectives and measures to support achieving each vision.

- **Primary prevention**
  - To have primary prevention programs fully implemented and controlled, enhance public cancer awareness to the level of the western EU countries average in order to reduce cancer incidence through primary prevention to the level of the western EU countries average.
- **Secondary prevention (early detection)**
  - To improve the ratio of early-stage to late-stage cancers at diagnosis by 20% for all cancer sites with implemented screening programs (breast, cervical, colorectal, and lung) and implement new screening programs pending positive outcomes of cost-effectiveness analysis (prostate, gastric, melanoma).
- **Diagnosis of cancer**
  - To improve capacity and capabilities for diagnostic procedures, treatment monitoring, and cancer after-care to meet all of the western EU standards by 2025.
  - Implementation of new, validated and cost-effective cancer molecular testing procedures with the aim of applying targeted therapies. The main goals are to determine the type of treatment that is the most effective for an individual patient, targeting the subpopulation of patients who will benefit most from the particular medicine, and avoiding toxic therapies for patients who do not need them. In addition, this type of research has a very important role in public health because of more efficient cost control.
  - To improve early detection and outcomes of the most prevalent hereditary cancers to reach the western European average.
- **Treatment of cancer**
  - To have more than 90% cancer patients presented before properly staffed, organized, and financed multidisciplinary teams (MDTs) to ensure joint decision about the best treatment option.
  - To have a majority of cancer surgery patients (more than 80%) operated by accredited cancer surgeons in accredited surgery institutions after MDT decision and strategy within the radicality frame of the western EU average.
  - To have all required radiation therapy treatments given without delay, according to the internationally defined standards using modern radiation therapy techniques with continuous quality control of equipment and treatment plans at the average of western EU countries.
  - Patient access to all systemic cancer treatments according to the nationally and internationally defined treatment guidelines with continuous monitoring of treatment-specific outcomes and with medicines expenditures at the average of western EU countries measured as GDP percentage adjusted for PPP.
  - Healthcare services will be optimized to better support cancer patients and help them re-engage with their family members and re-establish daily life routines. All stakeholders will collaborate in creating positive attitudes and conditions in society to aid rehabilitation and reintegration of cancer patients.
- **Specific oncology areas**
  - To have all pediatric cancer care given according to the internationally defined guidelines with continuous quality control and with medicine access/methods at the average of western EU countries.

- To improve the care of patients suffering from hematologic malignancies to meet western EU standards.
- To have all rare tumors diagnosed, treated, and followed up according to internationally defined guidelines and with individualized diagnosis and medicine access/expenditure at the average of western EU countries.

- **Palliative care and pain relief**
  - Equal access to high-quality palliative care, integrated into all levels of healthcare systems to ensure that any cancer patient's or family caregiver's suffering is relieved to the greatest extent possible.

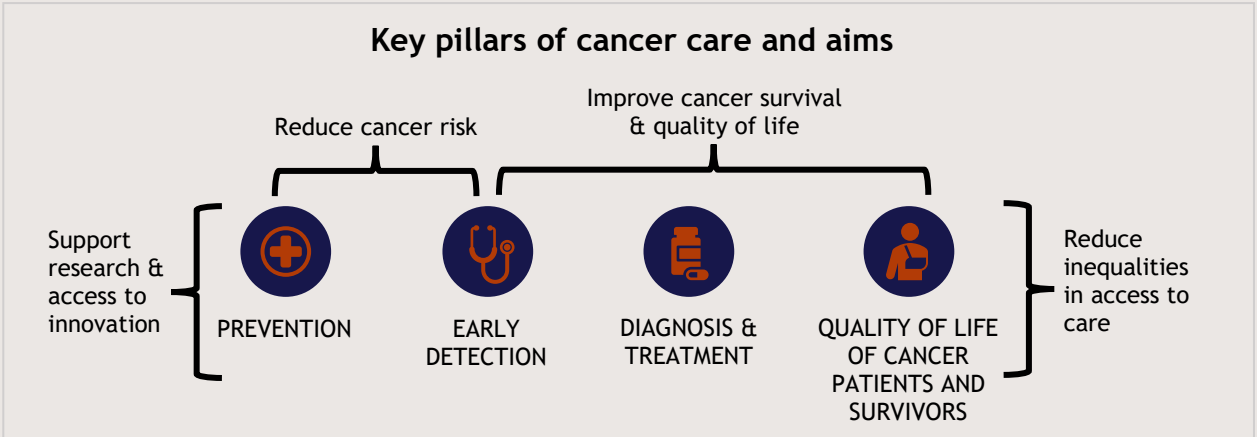
- **Cancer education**
  - To have optimal and continuous education of all medical professionals according to international standards as well as to significantly increase general public knowledge about cancer related issues.
  - To increase international cooperation - scientific and clinical - in oncology to the level of the western EU average.

- **Cancer research**
  - To increase scientific coverage and output in oncology to the level of the western EU average.

- **Creating a national cancer network, quality control, monitoring and reporting**
  - To establish a comprehensive, national cancer network where all patients will receive guideline-driven cancer care and with a single and complete database which will generate a continuous source of information about the quality of cancer care.
  - To have cancer registry and national cancer database coverage at the level of the Nordic EU average.
  - To ensure that the NCCP is implemented according to the highest possible quality standards.
  - To ensure continuous and precise monitoring and reporting of all significant activities within the NCCP.

Europe's Beating Cancer Plan (EBCP)

In 2021, the European Commission unveiled Europe's Beating Cancer Plan (EBCP), a comprehensive policy initiative aimed at tackling cancer through ten flagship initiatives that cut across four main areas of action - prevention, early detection, diagnosis and treatment, and the quality of life of cancer patients and survivors - and follow the entire disease trajectory (see figure below) (1). There are also several simultaneous goals of cancer care. One goal is to prevent what can be prevented. Approximately 30-50% of cancer cases could theoretically be prevented because they are caused by modifiable risk factors (6). Another goal is to improve the survival and quality of life of patients - through early detection (e.g. screening programs), diagnosis and treatment (e.g. through access to modern diagnostic tools and treatments), and follow-up care for survivors. Cross-cutting goals are to reduce inequalities in access to care (e.g. of different socioeconomic groups) and to support research and access to innovations to advance cancer care from the current status quo. Furthermore, the EBCP aligns with the EU Cancer Mission under the Horizon Europe 2021–2027 research funding program, emphasizing a collaborative approach to reducing cancer prevalence and enhancing patient care across Europe.



Disease burden of cancer

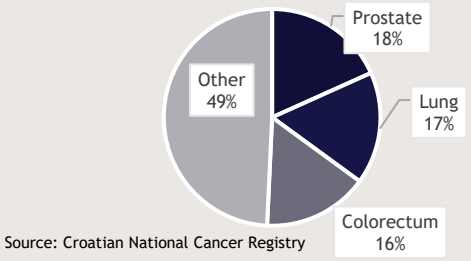
Incidence and mortality

In 2022, the number of new cancer cases (incidence) registered in the Croatian National Cancer Registry was 26,748 (14,255 men and 12,493 women) (7). The three most common diagnosed cancer types in men were prostate, lung, and colorectal cancer, and in women they were breast, colorectal, and lung cancer (7). They account for around half of all cancer cases. Around 37% of cancer patients were below 65 years at the time of diagnosis and the other 63% were 65 years or older (7), whereas in the EU 35% of new patients were below 65 years in 2022 (8). Cancer in working-age people has important implications for the economy and the size of the economic burden (see next section).

The number of cancer deaths (mortality) registered in the Croatian National Cancer Registry was 12,899 (7,363 men and 5,536 women) in 2022 (7). Lung cancer was the cancer type that caused the most deaths in both men and women, followed by colorectal cancer in both, and prostate cancer in men and breast cancer in women (7). Overall, cancer caused 23% of all deaths in Croatia in 2022, which made cancer the second-leading cause of death after cardiovascular diseases (39%), which is very similar to the EU (cancer caused 22% and cardiovascular diseases 33% of all deaths) (2).

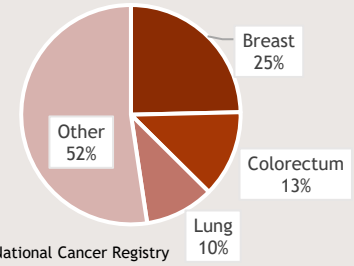
The cancer burden in Croatia is exceptionally high compared to other EU countries. Croatia had the second highest cancer incidence rate (694 cases per 100,000 inhabitants) and the highest mortality rate (335 deaths per 100,000) of all 27 EU countries in 2022 (7, 8). However, while incidence rates have increased by about 24% since 2013, mortality rates have stabilized and only increased by 4% until 2022 (7). Projections of future cancer numbers - which are based on the expected demographic development and take into account the effects of further population aging – indicate growing numbers of incidence and mortality in Croatia, exhibiting a similar trend as the EU overall. Cancer incidence (per 100,000) in Croatia is expected to grow by 14% between 2025 and 2040, and cancer mortality by 23% (9).

Cancer incidence among men in Croatia in 2022
Number of new cases: 14,255



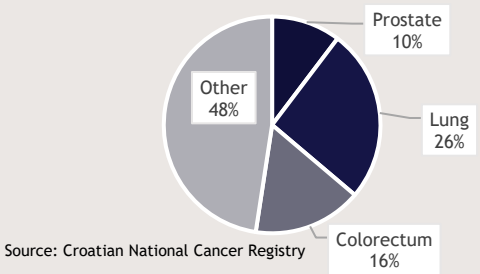
Source: Croatian National Cancer Registry

Cancer incidence among women in Croatia in 2022
Number of new cases: 12,493



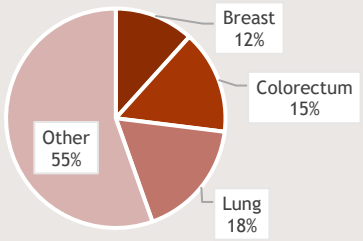
Source: Croatian National Cancer Registry

Cancer mortality among men in Croatia in 2022
Number of deaths: 7,363



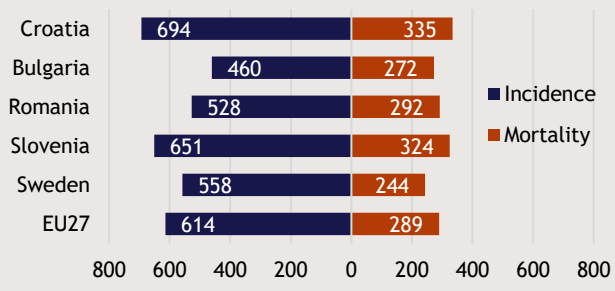
Source: Croatian National Cancer Registry

Cancer mortality among women in Croatia in 2022
Number of deaths: 5,536



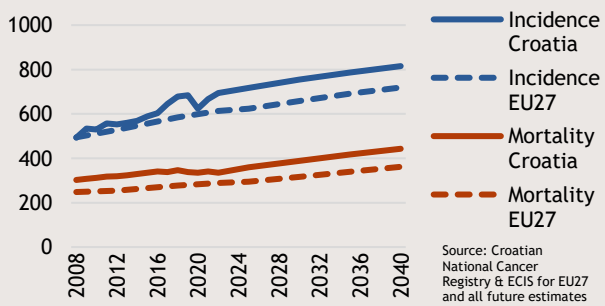
Source: Croatian National Cancer Registry

Cancer incidence and mortality per 100,000 inhabitants (crude rates) in 2022, both sexes



Source: Croatian National Cancer Registry and ECIS-estimates in other countries

Cancer incidence and mortality per 100,000 inhabitants (crude rates) over time, 2008-2040, both sexes

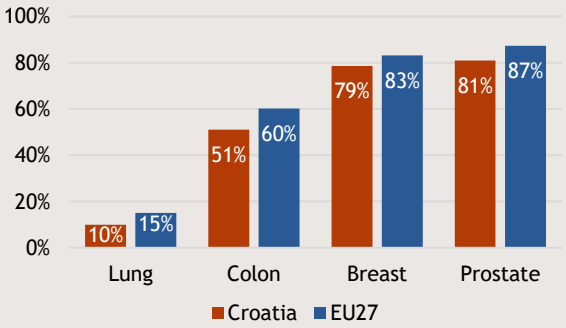


Source: Croatian National Cancer Registry & ECIS for EU27 and all future estimates

Survival

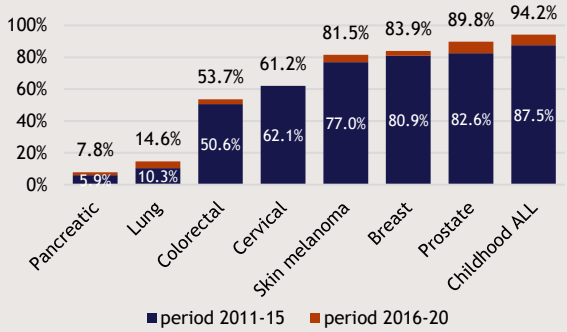
The latest internationally comparable survival rates are from the CONCORD-3 study which covered the diagnosis period 2000-2014 (10). The five-year relative survival rates in Croatia were estimated to be below the EU average for breast, colon, lung, and prostate cancer in the latest diagnosis period 2010-2014 (10). The Croatian survival rates had improved compared to the earlier diagnosis period in 2000-2004, except for lung cancer (10). More recent survival data comparing Croatia to the EU average are not available. However, updated national data from the Croatian National Cancer Registry were published in the *OECD Country Cancer Profile for Croatia 2025* (11). These data show that the five-year relative survival rate for cancer patients diagnosed in 2016-2020 had improved compared to those diagnosed in 2011-2015 in seven out of eight cancer types considered. The most notable increase was seen in prostate cancer, with the survival rate rising from 83% to 90%. In contrast, a small decline was observed in cervical cancer, where the survival rate fell from 62% to 61% (11).

5-year survival rates in Croatia and EU in 2010-2014



Source: CONCORD-3. Notes: Relative survival rates

5-year survival rates in Croatia in 2011-2015 vs 2016-2020



Source: Croatian National Cancer Registry. Notes: Relative survival rates

To inform policy priorities, it is important to understand the drivers of improvements or deteriorations in incidence, mortality, and survival. The challenge is that there is simultaneous progress in many areas of cancer care, and therefore it is difficult to isolate the effect of, e.g., the use of new medicines on survival from overall developments in cancer care that may also contribute in a real-world setting. Nevertheless, some US-based studies have tried to determine the contribution of different components of cancer care to the observed decline in age-standardized mortality rates (thus not survival rates). A study focusing on breast cancer found that 75% of the observed decline in mortality rates in 1975-2019 was attributable to enhanced treatment with cancer medicines (47% in early-stage, 29% in metastatic stage), while the remaining 25% were attributed to earlier detection from screening (12). Another study of five cancer types found that the estimated number of averted deaths in 1975-2020 was mostly explained by improved prevention and screening (80%) and to a lesser extent by better treatment (mostly with cancer medicines) (20%) (13). A third US study of a larger number of cancer types estimated that the observed reduction in mortality rates in 2000-2009 was mostly caused by new medicines (58%), followed by better diagnostic imaging (29%) and a decline in incidence (9%) (14). A study for Spain covering the period 1999-2016 found that cancer sites in which more new cancer medicines had been introduced saw larger reductions in mortality during this period (15).

Recommendations

- Reduce the reporting lag in the National Cancer Registry data by ensuring appropriate staffing to work with the data. Aim to publish cancer incidence, mortality, and survival statistics on a timelier basis, such as in Sweden where new statistics for the previous year are published in December of every year. This would enable faster monitoring of the current situation and the impact of ongoing initiatives as well as more responsive policy action.
- Publish survival rates for all cancer types (and ideally also by stage at diagnosis) on the National Cancer Registry website, such as done by the national cancer registry in Slovenia.
- Publish annual data on stage distribution at diagnosis by cancer type on the National Cancer Registry website (e.g., such as done by the Netherlands Cancer Registry) in order to facilitate measurement of the progress in the area of early detection.

Economic burden of cancer

In Croatia, the overall economic burden of cancer was estimated to amount to €236 per capita in 2018 (16). Most of the burden was caused by lost productivity among working-age patients (65%) and healthcare expenditure (26%). In comparison, lost productivity accounted for only 35% of the burden in the EU but healthcare expenditure for 51%.

The economic burden of cancer consists of:

Healthcare expenditure (direct costs):

- Resources of the healthcare system (medical equipment, staff, medicines, etc.) funded both by public and private sources

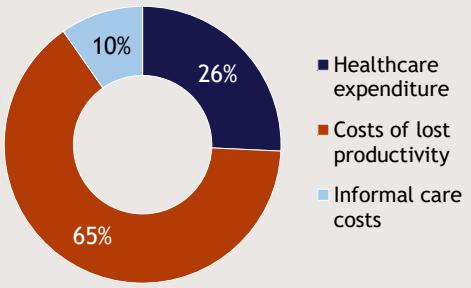
Costs of lost productivity (indirect costs):

- Productivity losses from absence due to sickness, permanent incapacity/disability, and premature mortality of working-age patients

Informal care costs:

- Value of the time forgone by relatives and friends to provide unpaid care

Composition of the economic burden of cancer in Croatia in 2018



Source: Hofmarcher et al. (2020)

Newer estimates of the economic burden of cancer (excluding informal care costs) in Croatia indicate that the total burden increased from €236 to €262 per capita from 2000 to 2023 (in 2023 prices) (17). Yet there were opposite trends for healthcare expenditure and productivity losses in Croatia as well as the EU as a whole (17).

Healthcare spending on cancer in Croatia is estimated to have increased by about 77% since 2000, reaching €90 per capita (€130 per capita after adjusting for purchasing power parity, PPP) in 2023. This was considerably lower than the EU average of €268 per capita in 2023 and also below Slovenia (€161 PPP-adjusted) and Sweden (€240), but similar to Bulgaria (€144) and Romania (€134). The bottom-left graph shows that a root cause for the lower spending level on cancer care in Croatia is the lower proportion of healthcare expenditure in relation to GDP (7.6% in Croatia vs 10.1% in the EU), and less so the estimated proportion of cancer-specific healthcare spending (6.0% in Croatia and 6.9% in the EU) (17). Compared to the disease burden that cancer causes in terms of death – 23% of all deaths in Croatia in 2022 (2) – the relative health spending level on cancer of 6.0% appears rather low, although the situation is similar across all countries in Europe.

Cancer in Croatia accounts for

23%

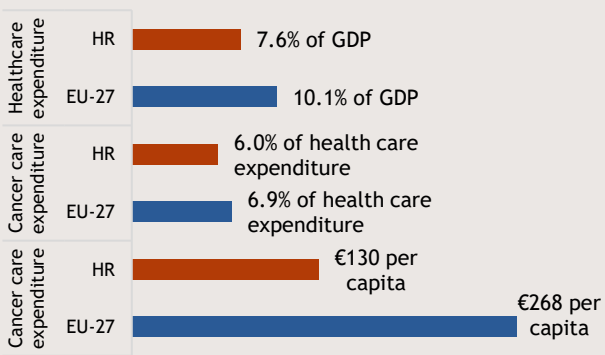
of total deaths in 2022

6%

of total health expenditure in 2023

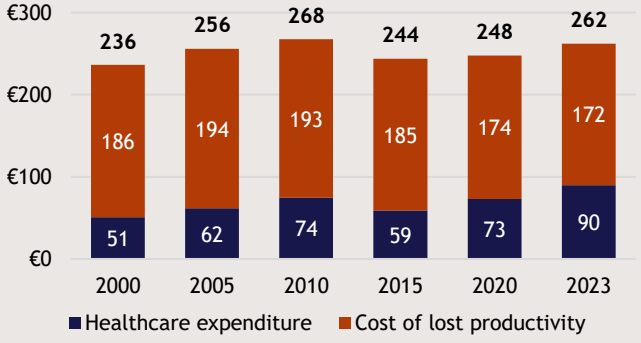
A positive development is that the estimated costs of lost productivity from cancer in Croatia declined by 7% from €186 to €172 per capita [€253 PPP-adjusted in 2023] between 2000 and 2023 (in 2023 prices) (17). However, the costs of lost productivity declined stronger in the EU by 20% from €186 to €148 per capita between 2000 and 2023, and in Romania, Slovenia, and Sweden they declined by 24-25% whereas they increased in Bulgaria by 7%. The reduction in productivity losses in Croatia despite the continued rise in the annual number of new cancer cases reflects the improving survival rates in Croatia and underlines the economic value of investments in effective cancer care.

Healthcare expenditure and cancer care expenditure (2023)



Source: Eurostat and Manzano et al. (2025). € are PPP-adjusted.

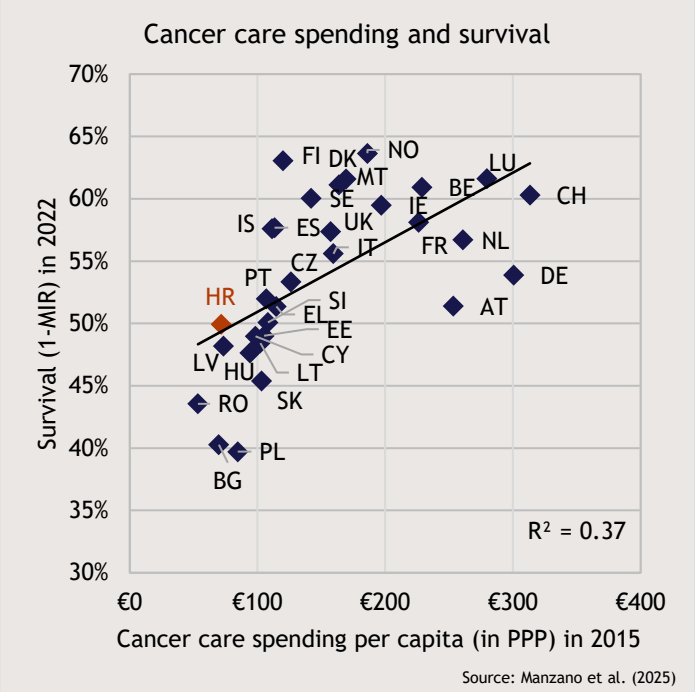
Economic burden of cancer in Croatia in € per capita (2023 prices)



Source: Values for 2000 to 2020 are unpublished data from Manzano et al. (2025)

Health spending on cancer care & survival rates

The ultimate aim of health spending on cancer care is to improve patient outcomes, both in terms of survival and quality of life. The figure to the right offers a crude way of exploring the link between cancer care spending and patient outcomes across European countries; see Manzano et al. (2025) for clarification on methodology (17). The upward-sloping trend line suggests that countries with higher cancer care spending tend to achieve higher survival. In contrast, countries with low spending generally report lower survival (mostly in Central and Eastern Europe). Croatia achieves a survival level that is line with its comparatively low spending level. While the positive association shown in the graph does not prove causality, it is consistent with previous evidence showing that European countries investing more in cancer care tend to achieve better survival outcomes (18, 19).



Source: Manzano et al. (2025)

The scattered pattern in the graph also underlines that spending alone is not enough. Patient outcomes are shaped by how resources are allocated and used across the entire care pathway. Strategic prioritization, such as early detection, timely diagnosis, and equitable access to effective treatment, is essential to translating spending into tangible survival benefits; see also the previous section on "Disease burden of cancer" and the discussion on the contribution of different areas in cancer care to improvements in mortality and survival. Going forward, further gains in survival will likely depend on the broad adoption and expansion of effective technologies, many of which come at a higher cost. Health systems must therefore ensure that investments in cancer care are used in a cost-effective and outcome-oriented way. This means not only evaluating the value of new interventions but also identifying and addressing inefficiencies along the entire care pathway.

Recommendations

- Continue to invest in cancer care to enhance the quality of healthcare services. Ensure that increased spending is directed towards high-impact areas along the care pathway and addresses bottlenecks. This includes early detection, timely diagnosis, access to novel diagnostics and therapies, and care coordination (see the remaining KPIs in the report).
- Establish systematic, annual reporting of healthcare spending on cancer overall and by cancer type by the Croatian Health Insurance Fund (HZZO). The current lack of cancer expenditure data hampers effective prioritization, value assessment, and resource planning.
- Apply a societal perspective in evaluating targeted investments in earlier detection and treatments in order to acknowledge and capture reductions in productivity losses induced by survival gains.
- Strengthen flexible work time arrangements to facilitate the reintegration of cancer patients and cancer survivors during and after treatment in order to reduce productivity losses.

Research

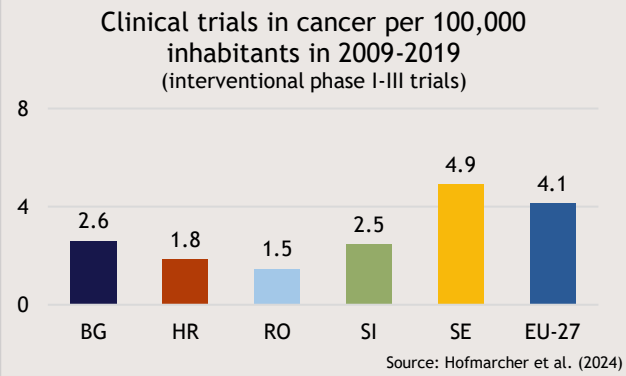
Clinical trials in oncology

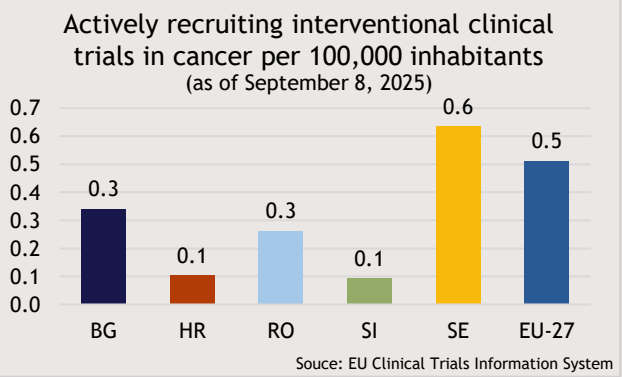
Background

- Clinical trials play a crucial role in advancing cancer care by generating evidence on the efficacy and safety of new treatments and provide patients with access to potentially life-saving treatments before they become widely available. Strengthening national clinical research capacity helps ensure that innovation reaches patients faster and improves the evidence base for decision-making. Yet as clinical trials are typically conducted in university hospitals, patients treated in less specialized or rural settings may face limited access, potentially creating within-country disparities in access to trials (20).
- The EBCP calls for strengthened cancer research and improved access to clinical trials across Member States through EU-wide initiatives, including the EU Network of Comprehensive Cancer Centers and the implementation of a legal framework for clinical trials (1). The EU Clinical Trials Regulation (Regulation (EU) No 536/2014), in force since 2022, introduced a centralized system for authorizing and monitoring clinical trials across Member States. It streamlines approval procedures, facilitates cross-country collaboration, and aims to strengthen the EU's clinical research environment (21).
- The Croatian NCCP includes a chapter on cancer research with a vision to increase scientific coverage and output to the level of the Western EU average. Specific measures to achieve this goal aim at increasing the conduct of clinical trials within the country by clarifying and simplifying the legal framework for the conduct of clinical trials, the adaptation of the legal framework to adhere to the new EU regulation on clinical trials, the establishment of a clinical trials registry, as well as an increase in international collaboration to facilitate Croatian patients taking part in clinical trials in other EU countries (5).

Current status in Croatia

- Access to clinical trials in oncology is uneven across European countries (20, 22). An analysis of interventional phase I-III cancer clinical trials in adults (conducted in 2009-2019) found that Croatia had 1.8 trials per 100,000 inhabitants, which was the second lowest number in the EU only behind Romania with 1.5 trials per 100,000. The EU average of 4.1 trials per 100,000 was more than twice as high as in Croatia (20). Countries in Central and Eastern Europe tend to have fewer trials than countries in Western and Northern Europe (20).
- According to the EU Clinical Trials Information System, there were four interventional clinical trials in oncology in seven sites in Croatia that were actively recruiting patients on September 8, 2025 (23). This corresponds to 0.1 trials per 100,000 inhabitants and puts Croatia in 23rd place among EU countries and well below the EU average of 0.5 trials per 100,000. Slovenia also only had 0.1 trials per 100,000, whereas Bulgaria and Romania had higher numbers. This pattern might reflect the difficulties of smaller countries attracting clinical trials, because a national approval for a trial in a larger country gives access to more patients. In addition, capabilities of healthcare system, effective commercial/non-commercial clinical trial collaboration models, negotiation times between companies and research institutions, regulatory and ethical approval timelines, and data protection laws have been cited as determinants for geographic disparities in clinical trials in Europe (24).





- Apart from clinical trials, lower research activity – as measured by the number of cancer research papers published – has been documented in Central and Eastern Europe than in other parts of Europe (25).

Recommendations

- Ensure and follow-up the implementation of the actions specified in the NCCP to increase cancer research and the number of clinical trials, e.g., through streamlining the legal framework.
- Increase the attractiveness for leading healthcare professionals, hospitals, and pharmaceutical companies to conduct clinical trials, e.g., through financial incentives.

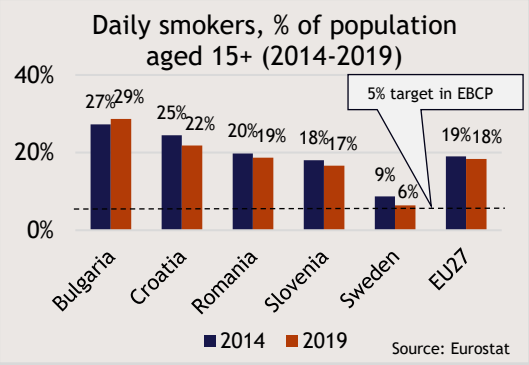
Prevention
Tobacco smoking

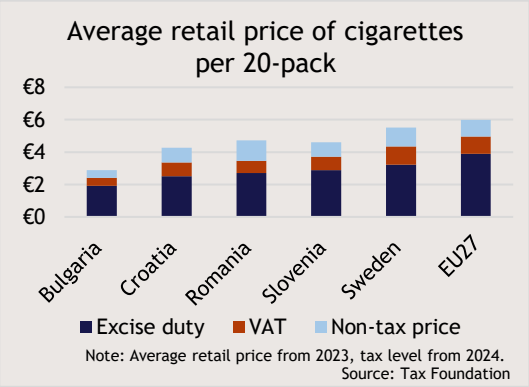
Background

- Tobacco smoking is a major risk factor for developing various cancer types (26), and it has been linked to cancers at 12 different sites (27). Around 80% of all lung cancer cases are linked to cigarette smoking (28).
- The WHO suggests that implementing tobacco control measures can prevent one in five annual cancer cases (29). In 2008, the WHO introduced the MPOWER framework – a package of six evidence-based, cost-effective, high-impact policy measures to help countries reduce the demand for tobacco (30). As part of this framework, best practice for tobacco taxation is defined as a total tax share of at least 75% of the retail price (30, 31). As of 2023, only one EU-country (the Netherlands) has implemented all six MPOWER measures at the best-practice level (32). The EBCP aims to help create a "Tobacco-Free Generation" where less than 5% of the population uses tobacco by 2040, compared to around 25% today (1).
- Croatia is party to the WHO Framework Convention on Tobacco Control (FCTC), ratifying the contract in 2009 (33). Croatia has worked actively on measures and activities related to tobacco control, among others with the Action Plan for Strengthening Tobacco Control (2013-2016) and the Act on Restrictions on the Use of Tobacco and Related Products from 2017. Tobacco restrictions include a ban from advertising and on consumption in public places, age restrictions for selling, restrictions on online sales, and the possibility for creation of no smoking zones in cities. The restrictions have also been extended to tobacco-related products (5). The NCCP includes measures such as the reduction of availability of tobacco and related products as well as the aim for continuous introduction of new measures in line with international strategies (5).

Current status in Croatia

- International data from Eurostat show a reduction of daily smokers (15+ years) in Croatia in the time period from 2014 to 2019. However, with 22% of the population being daily smokers in 2019, Croatia lies above the EU average and ranks among the countries with the highest proportion of daily smokers together with Bulgaria, Greece, and Latvia (34). The rates were higher in men (26%) than in women (20%) (11). Based on data from 2022, the smoking prevalence (daily and non-daily) in Croatia was 32.6% in the adult population (15+ years) and was again higher in men than in women (34.2% and 31.1%, respectively). Among children and adolescents (10-14 years), smoking prevalence (daily and non-daily) was 9.3%, and similar among girls (9.4%) and boys (9.1%) (35).
- According to the 2023 WHO FCTC report, Croatia is among the countries experiencing issues with illicit trade of tobacco (36). Estimates suggest that 25% of the cigarette consumption in Croatia consists of smuggled cigarettes (33).
- Croatia's above average smoking rates can be related to the strength of its tobacco control measures, as measured by the Tobacco Control Scale. After strengthening tobacco control policies in 2013, Croatia's score deteriorated until 2021 due to relaxation of the tobacco price control policies (11).
- As of July 2023, Croatia ranked fifth among EU countries with the lowest average retail selling price of cigarettes (€4.28 per 20-pack) and a tax share of 78.8%. This puts Croatia above the Bulgarian average price, but below Romania, Slovenia, Sweden, and the EU average of €5.98 (37).





Recommendations

- Rely on the WHO MPOWER framework to intensify public awareness campaigns and educational programs, emphasizing the health risks associated with smoking and the benefits of quitting.
- Sustain progress on tobacco taxation by gradually increasing the tax share to levels seen in peer countries, and consider earmarking some tax revenue for investment in health care as done in, e.g., Ireland (38).
- Combat the use smuggled cigarettes.

Prevention

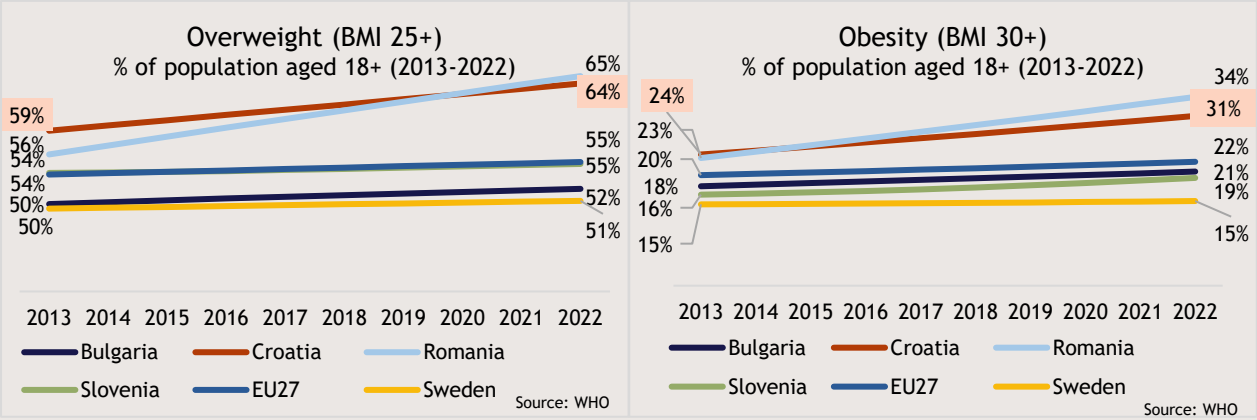
Overweight and obesity

Background

- Overweight (defined as a body mass index, BMI ≥25) and obesity (BMI ≥30) is a medical condition that increases the risk of various health problems, including cardiovascular disease, diabetes, and certain cancers (39). Obesity and overweight have been linked to the development of 13 cancer types (40). Around 2-7% of all cancer cases are linked to obesity and overweight in Europe (41, 42).
- The EBCP includes several measures related to address obesity, such as a revision of relevant EU action plans and schemes, launch of awareness campaigns, and digital apps (1). The European Code Against Cancer recommends to (i) limit food high in calories, sugar, fat, and salt, limit drinks high in sugar and instead drink mostly water and unsweetened drinks, and limit ultra-processed foods, (ii) be physically active in everyday life and limit the time spent sitting, and (iii) have a healthy diet, consuming whole grains, vegetables, legumes, and fruits (43). The WHO "Acceleration plan to stop obesity" endorses approaches relating to prevention, health literacy, and implementation of fiscal policies, including taxes and subsidies to promote healthy diets, to fight obesity (44).
- Croatia has implemented a number of policies, interventions, and actions for the prevention of overweight and obesity. Among them are measures such as taxation of soft drinks and aiming at facilitating children to follow healthy diets by prioritizing fruits, vegetables and plain milk in school food. Most recently, Croatia adopted the Action Plan for Obesity Prevention 2024-2027 which includes the target to halt overweight and obesity prevalence at 2019 levels by 2027 (45). The NCCP mentions explicitly the aim of reducing obesity and improving eating habits for all age groups, with a target to reach a prevalence level of Western European countries (5).

Current status in Croatia

- Croatia is among the EU countries with the highest prevalence of overweight and obesity in the adult population (aged 18+ years), and the trend is increasing. Based on statistics from the WHO, the proportion of overweight adults has increased from 59% in 2013 to 64% in 2022. In the same time period, the proportion of obese adults has increased from 24% to 30%. In both cases, Croatia has similar proportions as Romania and lies above Bulgaria, Slovenia, Sweden, and the EU average (46, 47).



- Differences in proportions can be observed for both sex and education. The prevalence of overweight and obesity was larger in men compared to women (72% vs 56% and 34% vs 27%, respectively) (46, 47). In terms of education, larger proportions of overweight and obesity could be observed for low, followed by medium and lastly high educational level in Croatia (48).
- Poor nutrition is a contributing factor to the prevalence of overweight in Croatia. Among adults, the consumption of fruit and vegetables as decreased from 2014 to 2019, with 29% not consuming any and 62% consuming 1 to 4 portions a day (49). Rates are lower for lower educational levels compared to higher levels (49).

Recommendations

- Ensure full implementation and evaluation of interventions included in the Action Plan for Obesity Prevention.
- Initiate nationwide campaigns to raise awareness about the cancer-related risks of obesity and overweight and the importance of maintaining a healthy body weight and diet to prevent cancer.
- Consider introducing subsidies for fruits and vegetables and raising taxes for soft drinks in line with WHO recommendations.

Prevention

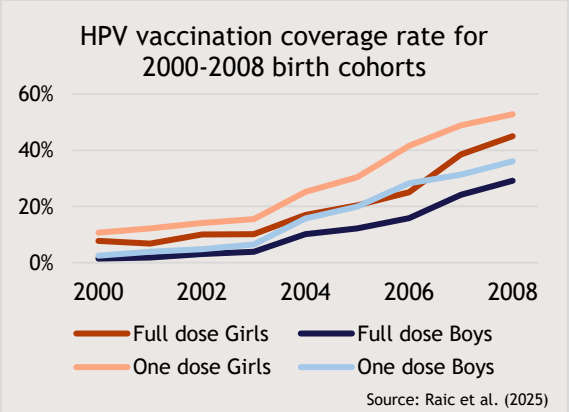
Vaccination against human papillomavirus (HPV)

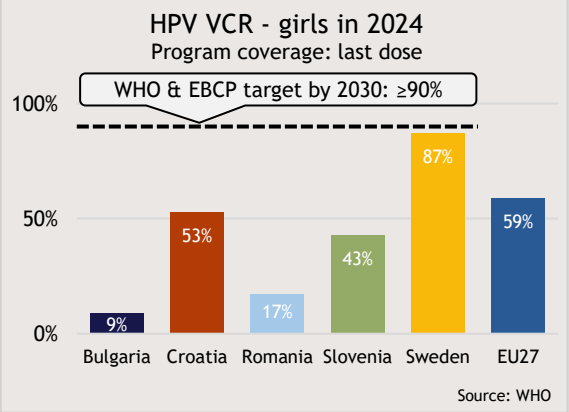
Background

- HPV is a group of sexually transmitted viruses that causes around 2.5% of all cancers in women and men in Europe (50). The first vaccine against HPV was approved in the EU in 2006. HPV vaccines have been found to be an effective and cost-effective way to prevent cervical cancer and other HPV-related cancers (50). According to the WHO, the best option is to vaccinate girls around age 9-14, just before they become sexually active (51). There is, however, value in vaccinating boys and older teenagers and young adults, at least up to the age of 26 because it can protect against a new infection or re-infection and block transmission to a new partner (50).
- As part of its global strategy to eliminate cervical cancer, the WHO calls on all countries to achieve a 90% HPV vaccination coverage rate (VCR; fully vaccinated) in girls by age 15 by 2030 (50). Reflecting the WHO's global target, the EBCP aims to achieve at least a 90% HPV VCR in girls in the EU by 2030, and to significantly increase the VCR in boys by the same year, although no specific target has been set (1). This goal was reaffirmed in the 2024-recommendation on vaccine-preventable cancers by the Council of the EU (52).
- HPV vaccines have been available in Croatia since 2007 (53). In 2016, universal and free HPV vaccination was included in the national immunization program (NIP) (53-55). In the 2025-2027 program, HPV vaccination is recommended for children attending the sixth grade of primary school (56). Optional and free vaccination is also available for 9-25-year-olds, and also for >25-year-olds with certain medical conditions (immunodeficiency, previous HPV infection with malignancy) (56). School kids and university students are vaccinated by school physicians, whereas people outside the school system can be vaccinated by any physician (56).
- The NCCP includes the aims to ensure financial means and provide organizational prerequisites for continuously providing HPV vaccination. It further specifies the aim to monitor vaccination rates (5).

Current status in Croatia

- Unlike in most other EU countries, there is no national data collection on the HPV VCR in Croatia, as HPV vaccination is voluntary only mandatory national vaccinations are monitored (53, 55, 57).
- A published study estimated the HPV VCRs in Croatia based on aggregated data from school physicians for the birth cohorts of 2000 to 2008 (53). Based on this data, it can be observed that the uptake of HPV vaccination has increased with every birth cohort. For full dose vaccination, the VCR for girls increased from 7.7% to 45.0% and for boys from 1.4% to 29.1% from the 2000 cohort to the 2008 cohort. The coverage rates for one dose only were slightly higher in 2008 (53% for girls and 36% for boys) (53).
- WHO data for 2024 show that the VCR for girls in Croatia was 53%, higher than the VCRs of Bulgaria (9%), Romania (17%), and Slovenia (43%), but below the VCR of Sweden (87%) and the EU average (59%) (58). For boys, the Croatian VCR was 37%, also below the EU average (50%).
- In a national cross-sectional survey of young adults (18-25 years) in Croatia, lower vaccine hesitancy was observed in women, among individuals who believed themselves to be at higher risk of sexually transmitted diseases, and among individuals who were aware of the link between HPV and cancer, whereas vaccine hesitancy was higher among religious individuals (57).





Recommendations

- Consider making the HPV vaccine mandatory in line with other childhood vaccines in the NIP.
- Expand digital outreach to parents (e-consent) through an invitation and reminder system to the whole country and possibly also integrate HPV vaccination reminders into school e-diaries to streamline communication.
- Upgrade national electronic vaccination registries to enable real-time monitoring of HPV coverage across regions and socioeconomic groups and guide targeted, data-driven interventions.

Early detection

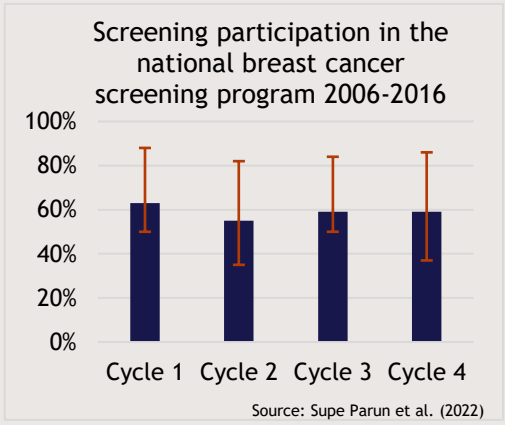
Breast cancer screening

Background

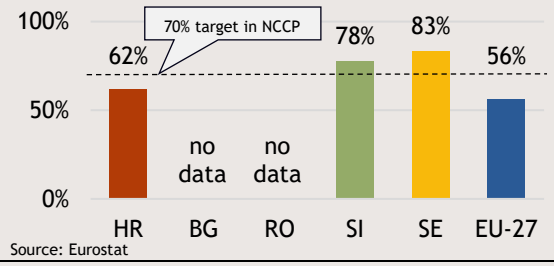
- The goal of breast cancer screening is to detect a tumor as early as possible when it is still small and amenable to curative treatment (59). In early disease stages, survival rates are highest and treatment costs lowest (60).
- The EBCP includes the aim to invite 90% of the target population in each country for breast cancer screening by 2025 (1). Quality guidelines by the European Commission state that a breast screening participation rate above 75% is desirable (61). The updated screening recommendation by the Council of the EU from 2022 states that screening with mammography should be conducted in women aged 45–74 years (previously 50–69 years) every two years (62).
- Breast cancer was the third most common cause of cancer death in Croatian women in 2022 (7). The number of avoidable deaths from the disease has decreased by 8% since 2011, but it is still 18% above the EU average (11).
- In Croatia, a national screening program for breast cancer was implemented in 2006 (63). It is coordinated on a national level; however, Croatia's 21 regions are responsible for the execution and they report the results back to the national committee (64). In 2025, with the start of the ninth cycle of inviting women to free mammography examinations, all women aged 49 to 70 will receive an invitation (63). Invitations are sent based on tax identification numbers of all insured citizens which makes for a comprehensive approach given that health insurance is mandatory in Croatia (11). In Croatia's NCCP, the following goals are set for the breast cancer screening program among others: 1) reduce the breast cancer related mortality by 25% within five years of program implementation, 2) detect cancer at an early stage, 3) improve the quality of life of patients and 4) participation rate of 70% (5).

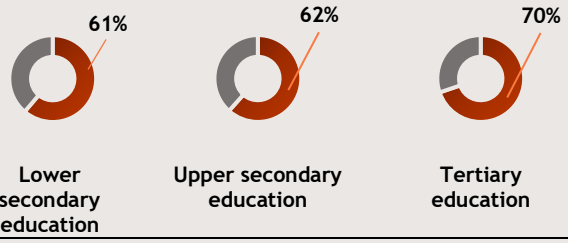
Current status in Croatia

- An analysis of the national breast screening program in 2006-2016 showed that on a national level, the participation was relatively stable at around 60% in the first four cycles of the program (64). However, large regional variations in participation were observed, e.g., between 37% and 86% in cycle 4. Importantly, the analysis found that the proportion of cancers diagnosed at an early stage increased (64).
- Croatia's breast cancer screening participation rate was 62% in 2023, which was higher than the EU average (56%), but lower than Slovenia (78%) and Sweden (83%) (65). Since 2013, the Croatian participation rate was always around 60-64% except during the COVID-19 pandemic when it dropped to 56% in 2020-2021. The Croatian Institute of Public Health reports slightly higher participation of 67% (63). In addition, self-reported Eurostat data from 2019 highlight disparities: a lower education level is associated with lower participation in screening among all EU countries, including Croatia (61% participation rate in women with lower secondary education vs. 70% in women with tertiary education) (66). A similar trend is observed between women with low and high income levels (67).



Breast cancer screening rate: 2023 program data & 2019 self-reported data by education (50-69 years)





Recommendations

- Consider targeted campaigns 1) in regions with low screening participation and 2) for women in the target age group with a lower educational or income level in order to increase their screening participation and get close to the 70% goal of the National Cancer Control Plan.
- Expand the target age group of the screening program from 49-70 to 45-74 years in line with the latest recommendation by the Council of the EU in the tenth cycle of the program.

Early detection
Cervical cancer screening

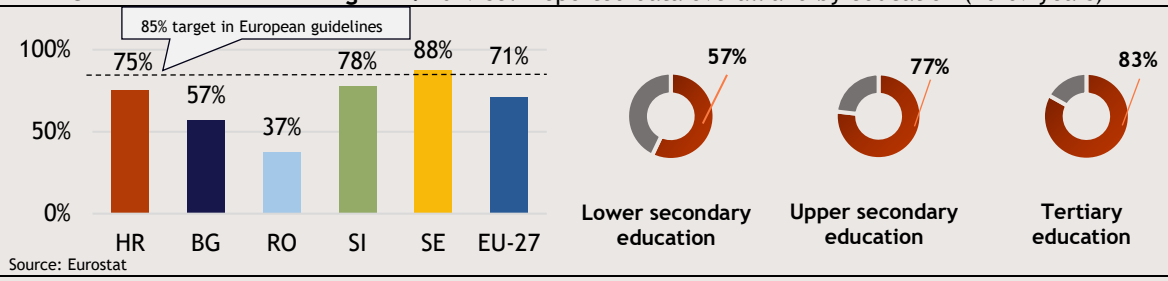
Background

- The aim of cervical cancer screening is to detect a cancer before the onset of symptoms or even earlier in its pre-stages. In early disease stages, survival rates are highest and treatment costs lowest (68, 69). Cervical cancer screening used to be done with a Pap smear test every three years. The discovery of HPV as the cause of cervical cancer has led to the development of HPV tests as a screening method (51).
- The EBCP includes the aim to invite 90% of the target population in each country for cervical cancer screening by 2025 (1). Quality guidelines by the European Commission state that a cervical screening participation rate above 85% is desirable (70). The updated screening recommendation by the Council of the EU from 2022 states that countries should use HPV tests and screen women aged 30-65 at an interval of five years or more (62).
- Data from the Croatian National Cancer Registry show that the five-year net survival rates of cervical cancer was 61% in the time period 2016-2020, which was one percentage point lower than in 2011-2015 (11). Furthermore, the number of potential years of life lost due to cervical cancer increased between 2012 and 2021 (11), emphasizing the need for better prevention, early diagnosis, and treatment.
- Opportunistic cervical cancer screening was introduced in Croatia already in the 1960s (71). A pilot study for a population-based program started in 2006 in Primorsko-Goranska County (71, 72). The National Cervical Cancer Screening Program targeting women aged 25-64 years offering Pap test every three years started in 2012 and was organized as a population-based program in 2016, but it was suspended the same year and remained opportunistic ever since (11, 73, 74). A self-sampling pilot project for HPV testing in Zadar County is being developed and tested since 2024 (75). Croatia's NCCP outlines aims for the early detection program for cervical cancer, such as 1) a decrease in the incidence of invasive cervical cancer by 60% in 25-65-year-old women within eight years from the beginning of the program, 2) an 80% reduction in mortality in all women aged 25-70 years within 13 years after the beginning of the program, 3) to gradually phase out the opportunistic screening program (5).

Current status in Croatia

- Official data on the participation in the cervical cancer screening program in Croatia are not reported at Eurostat due to the opportunistic nature of the program (65). The EU average of the participation rate in countries with organized screening programs was 53% in 2023, but only 6% in Romania and 74% in Slovenia and 78% in Sweden.
- Based on self-reported Eurostat data from 2019 on the last cervical smear test, 75% of Croatian women reported having taken a test within the last three years, which was a similar level as in 2014 when it was 77% (76). The Croatian level in 2019 is lower than Sweden (88%) and Slovenia (78%), but higher than the EU average (71%), Bulgaria (57%), and Romania (37%).
- The 2019 self-reported data also highlight educational disparities: a lower education level is associated with lower participation in cervical cancer screening in Croatia (57% participation rate in women with lower secondary education vs. 83% in women with tertiary education) (76). A similar pattern can be observed with regard to income level (77).

Cervical cancer screening rate: 2019 self-reported data overall and by education (20-69 years)



Source: Eurostat

Recommendations

- Continue to transform the opportunistic program into an organized program and incorporate the new age group and primary screening method (HPV test instead of Pap smear) and screening interval in line with the latest recommendation by the Council of the EU.
- Follow through on the pilot in Zadar County to test sending HPV self-sampling kits to women to assess effects on participation, similar to best practice examples in other EU countries such as Sweden (78, 79).
- Consider targeted campaigns for women in the target age group with a lower educational or income level in order to increase their screening participation.

Early detection
Colorectal cancer screening

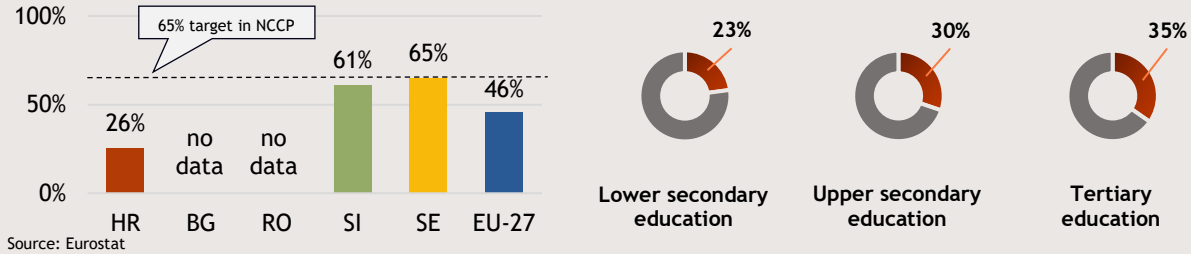
Background

- Colorectal cancer is to a large extent curable if diagnosed early and if appropriate treatment is provided (80). Treatment costs are also lowest in early stages of the disease (69). There are multiple colorectal cancer screening methods, including stool-based tests (fecal immunochemical test, FIT; guaiac fecal occult blood test, gFOBT; multitarget stool DNA test), blood-based tests, and imaging-based tests (colonoscopy, computed tomography colonography, colon capsule, flexible sigmoidoscopy) (81).
- The EBCP includes the aim to invite 90% of the target population in each country for colorectal cancer screening by 2025 (1). The updated screening recommendation by the Council of the EU from 2022 confirmed the previous screening recommendation for colorectal cancer in all people aged 50–74 years, and it established FIT as the preferred triage test for referring individuals for follow-up colonoscopy (62). Quality guidelines from 2012 note that the screening interval with FIT should not exceed three years, with a desirable participation above 65% (82).
- According to the OECD, avoidable mortality from colorectal cancer in Croatia was 69% (16 deaths per 100,000) in 2021 and 109% (37 per 100,000) higher in women and men compared to the EU average. Additionally, it has decreased less from 2011 to 2021 compared the EU average (11). Data from the Croatian National Cancer Registry show that the five-year net survival rates of colorectal cancer improved from 51% in 2011-2015 to 54% in 2016-2020 (11).
- The Croatian National Program for the Early Detection of Colorectal cancer was launched in 2007 (5). The target population includes men and women between the ages of 50 and 74 years. Screening invitations are sent out via letter every two years. The primary test method is gFOBT, followed by a colonoscopy in case of a positive test result (83). Croatia's NCCP sets out an aim for screening participation of 65% (5).

Current status in Croatia

- The national screening program for colorectal cancer in Croatia has had fairly low participation rates since its launch. For the first three cycles (2007-2018) of the program, the response rate and proportion tested were estimated at 22% and 19%, respectively. For the fourth cycle, a higher response rate and proportion tested of 36% and 25%, respectively, was observed (84).
- In 2023, participation in the colorectal cancer screening program in Croatia was reported to be 26% (65). This is below the EU average of 46%, and also significantly lower compared to Slovenia (61%) and Sweden (65%).
- Based on self-reported Eurostat data from 2019, differences in participation across educational levels could be observed: among men and women with lower secondary education, 23% participated, compared to 35% of men and women with tertiary education (85).

Colorectal cancer screening rate (men & women):
2023 program data & 2019 self-reported data by education (50–74 years)



Source: Eurostat

- In 2022-2023, a study was conducted to investigate the reasons for non-participation in the program. The findings of this study indicate that ignorance of what the implications of testing are and how the tests are applied is the main reason for not participating (84).
- Currently, there is a study ongoing by the Croatian Institute of Public Health in collaboration with the World Health Organization (WHO) with the aim to increase participation and completion of home testing as well as to improve the understanding of the lack of the former (86).

Recommendations

- Switch from gFOBT to FIT as the primary test method in line with 2022 Council recommendation.
- Conduct more awareness and colorectal cancer literacy campaigns to increase the population's knowledge about the benefits of colorectal cancer screening and how the tests are conducted.
- Involve GPs – similar to the experience with lung cancer screening – to explain and encourage people of the target age group to participate in screening in order to get closer to a participation rate of 65%.

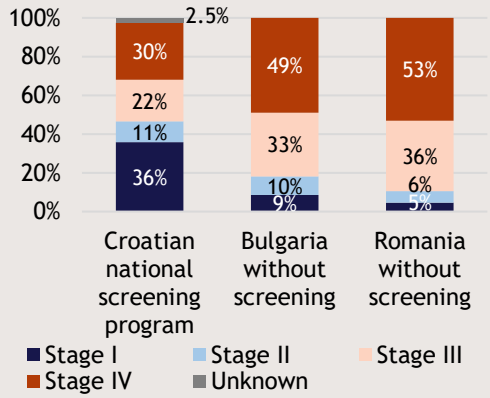
Early detection
Lung cancer screening

Background

- The detection of lung cancer at earlier stages results in higher survival rates and lower treatment costs (69, 87). Due to the mild and non-specific symptoms of lung cancer in early stages, the disease is diagnosed at a metastatic stage in around 50% or more cases (88). Results from several randomized controlled trials show that targeted screening of former and current heavy smokers with low-dose computed tomography (LDCT) results in an extensive shift of patients to an earlier stage at detection and subsequent reduction in mortality by at least 20% (89, 90). The number needed to be screened to avoid one cancer death has been estimated to be around 130-220 individuals, which is considerably lower in comparison with breast cancer (645-1724 individuals) (89).
- The updated screening recommendation by the Council of the European Union from 2022 states that countries should explore the feasibility and effectiveness of LDCT to screen individuals at high risk for lung cancer, including heavy smokers and ex-smokers, and link screening with primary and secondary prevention approaches (62). Furthermore, EU countries are encouraged to conduct research on how to reach and invite the target group, as population registries do not contain information on people's past and current smoking behavior. To support the implementation and optimization of LDCT screening programs, a large EU project called SOLACE, funded under the EU4Health Program and also involving Croatian experts, is ongoing in multiple EU countries (90).
- Croatia has a higher lung cancer incidence and mortality compared to the EU average (8). In 2022, the estimated age-standardized incidence rate of 82.1 per 100,000 was above the EU average of 66.1 per 100,000. The age-standardized mortality rate was also higher compared to the EU, with 67.2 per 100,000 and 52.0 per 100,000, respectively. In the Croatian NCCP, several targets for lung cancer screening are included: 1) reach a screening response rate of 60% in the target population, 2) reduce lung cancer mortality by 25%, and 3) increase 5-year survival from 6% to 15% (5).

Current status in Croatia

- Croatia was the first EU country to launch a national lung screening program in 2020 (91, 92). The program targets active smokers (30 pack-years) aged 50-75 years as well as previous smokers (quit smoking in the last 15 years) (93). Participants are recruited through primary care physicians (GPs) (93). The program aims to enroll 50% of the eligible population after five years and reduce lung cancer deaths by 20% after 10 years (94).
- 45,341 LDCT scans were performed in 34,648 participants from October 2020 to October 2024 (95). Cancer was detected in 669 cases of which 615 were lung cancer (95). Among the lung cancer cases, 46.5% were diagnosed in early stage and only 29.5% in stage IV (95). By contrast, without screening – such as in Bulgaria or Romania – around 50% of cases are usually detected in stage IV (88).
- The number of scans has increased dramatically each year, from 503 in 2020 to 22,127 in 2024 (94). The goal was to screen 30,000 people by the end October 2024 (e-mail correspondence; Coordination Team of the Croatian National LC Screening Program), but the program managed to surpass that by screening approximately 35,000 people with around 45,000 scans (95).
- As of September 2025, around 86% of people who were referred from the GP to the radiologist for screening went and got screened (94), indicating a high willingness to participate.



Sources: Samaržija et al. (2025), Hofmarcher et al. (2022)

- The initial Croatian results are in line with international experiences of trials and pilot programs – such as the NELSON trial (96), the German HANSE study (97), the UK Lung Cancer Screening Trial (98) – which demonstrated the ability of lung cancer screening in shifting the stage distribution towards earlier stages.

Recommendations

- Continue educational campaigns to raise awareness about the benefits of early detection through LDCT screening. Engage both citizens and healthcare providers to ensure widespread participation and understanding.
- Encourage GPs and specialists to refer people for lung cancer screening in parallel with mammography or colorectal cancer screening, if risk factors (smoking) are present (so-called cross-referrals).

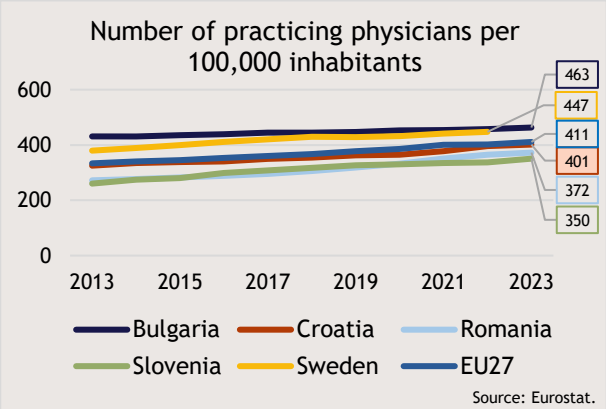
Diagnosis and treatment
Health workforce

Background

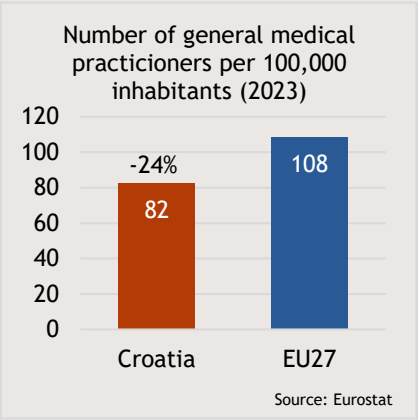
- Modern cancer care is highly specialized and requires competence from different medical fields. This includes pathologists and diagnostic radiologists for the diagnosis of cancer, and surgeons, radiotherapists, medical oncologists, and hematologists for the treatment (99). General practitioners (GPs) play a key role in facilitating early diagnosis in primary care as they refer patients with signs and symptoms to the appropriate specialist (100). Nurses are involved throughout the care process, delivering patient education and treatment support (101).
- The Croatian NCCP includes organizational and educational goals for physicians and nurses (e.g., integration in multidisciplinary teams or inclusion of certain courses during studies); however, the plan does not include any concrete targets regarding numbers of physicians and nurses in the medical workforce (5).

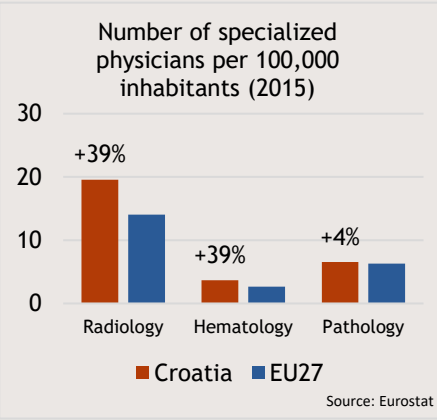
Current status in Croatia

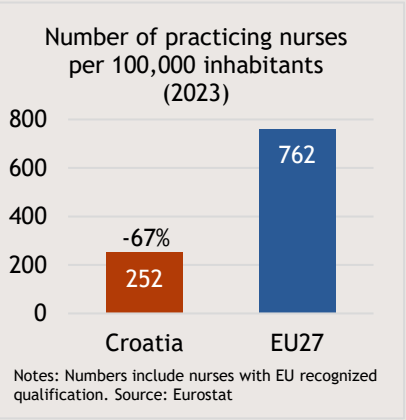
- Croatia has an average number of practicing physicians (of any specialty) per 100,000 inhabitants compared to the EU average, as evidenced by the top figure. The physician density in Croatia was higher than in Slovenia and Romania, but lower than in Bulgaria and Sweden. Since 2013, the physician density in Croatia has increased by roughly 23% (102).
- For general medical practitioners, the Croatian density was 24% below the EU average in 2023 (bottom left figure) (103). Considering the importance of GPs in primary care for easy accessibility for patients with signs and symptoms of cancer, this might be a bottleneck to facilitate early detection.



- The Croatian density of various oncology-related specialties differs (bottom middle figure). Physicians specialized in radiology, hematology, and pathology were more common in Croatia compared to the EU average in 2015 (104). A newer study reported the number of oncologists in Croatia to be 3.1 per 100,000 in 2020, which was lower than in Germany, Italy, Spain, and the UK (105). According to the National Registry of Health Care Providers at the Croatian Institute of Public Health, there were about 9 cancer specialist physicians per 100,000 in 2023, which was considered sufficient for current needs, and the supply of specialists appeared stable (11).
- The number of practicing nurses is a concern in Croatia. Although the number of practicing nurses with EU recognized qualification per 100,000 inhabitants has doubled from 2013 to 2023 to 252 nurses per 100,000, it remains far below the EU average of 762 per 100,000 (bottom right figure) (102).
- Healthcare personnel in cancer care in Croatia are unevenly distributed geographically. There is an oversupply in urban areas and a shortage in rural areas as well as the islands off the Adriatic coast, leading to unmet medical needs in these areas (106).







Recommendations

- Recruit and retain more nurses involved in the diagnosis and treatment of cancer through more financially attractive positions and less stressful work environments.
- Implement strategies to incentivize healthcare professionals to practice in rural areas to meet the unmet need and improve cancer care for patients living there.

Diagnosis and treatment

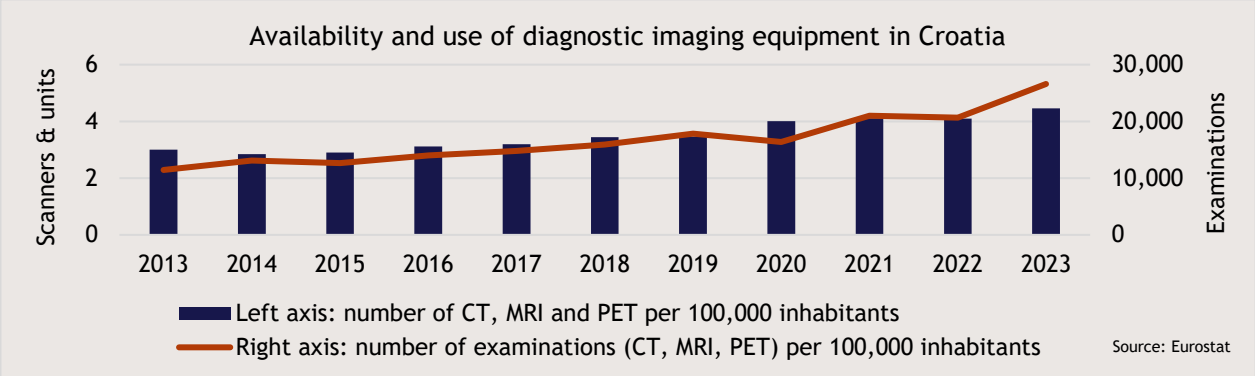
Diagnostic imaging equipment

Background

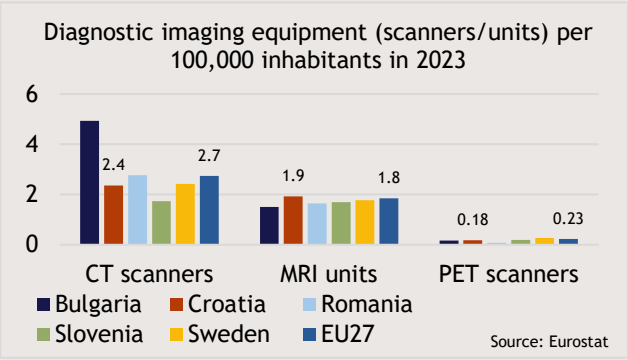
- Imaging equipment such as computed tomography scanners (CT), magnetic resonance imaging units (MRI), and positron emission tomography scanners (PET) are required throughout the cancer care journey including diagnosis, treatment, and follow-up to ensure accurate management decisions and optimal outcomes (107). The investment costs for scanners are high, and they require specialized medical personnel to operate them, which naturally restricts their availability. General guidelines or benchmarks regarding the ideal number of scanners per inhabitant or cancer patient do not exist (108). An undersupply of scanning units may lead to access problems in terms of geographic proximity and/or waiting times.
- The Croatian NCCP specifically includes the implementation of PET-CT scans at all university hospitals as a measure to improve diagnostic procedures and treatment monitoring (5).

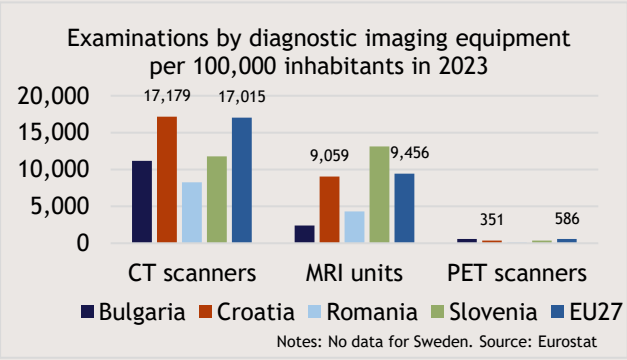
Current status in Croatia

- The availability of diagnostic imaging equipment in Croatia has increased by almost 50% from 3.0 CT, MRI, PET scanners or units per 100,000 inhabitants in 2013 to a 4.5 scanners or units per 100,000 in 2023 (109). Similarly, the number of examinations with this equipment more than doubled (+133%) from around 11,500 exams per 100,000 inhabitants in 2013 to almost 27,000 in 2023 (110).



- Looking at the composition of equipment, the number of CT scanners, MRI units, and PET scanners per 100,000 inhabitants is quite similar to other countries and higher than in Slovenia expect for PET scanners. Croatia was also close to the EU average with around 14% fewer CT scanners, 4% more MRIs, and 21% fewer PET scanners in 2023 (109). The examinations performed with the available equipment in Croatia are high especially for CT scanners and MRIs, whereas existing PET scanners seem to be underused (110). Specifically, Croatia recorded 1% more CT scans, 4% fewer MRIs, and 40% fewer PET scans per 100,000 inhabitants than the EU average in 2023.





Recommendations

- Increase the number of PET scanners while ensuring sufficient personnel to operate equipment and interpret results. This should reduce waiting times and strengthen diagnostic capabilities.
- Optimize workflows and integration of imaging into care pathways, including the use of AI-assisted analysis, to enhance efficiency and reduce diagnostic delays.

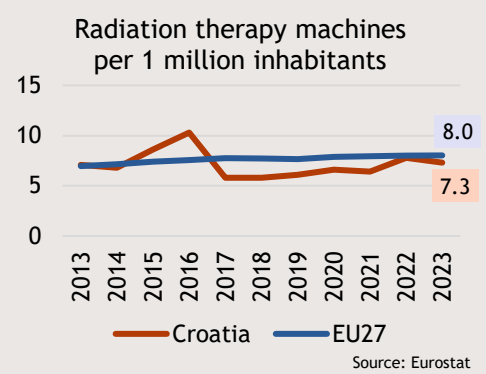
Diagnosis and treatment
Radiation therapy machines

Background

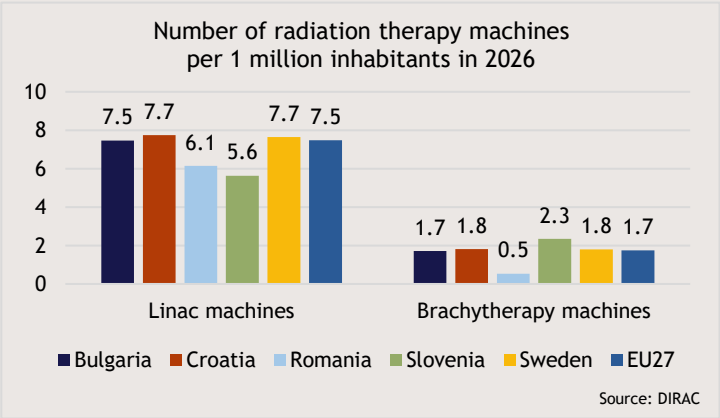
- Radiation therapy is essential in treating common cancers, with around 50% of all cancer patients requiring radiation therapy at some point during their treatment (111). The effectiveness of radiation therapy in targeting and eliminating tumors significantly influences patients' survival rates and quality of life (112, 113).
- Expanding access to radiation therapy requires both sufficient equipment and trained personnel to operate it. Strategic investments in infrastructure and specialist personnel are essential to ensure timely and equitable access to radiation therapy for all patients (114).
- The European Society for Radiotherapy and Oncology (ESTRO), through the ESTRO-QUARTS capacity planning work, suggests a benchmark of one linear accelerator (linac) per 450 cancer patients requiring radiation therapy per year (115). This benchmark is widely referenced in radiation therapy capacity planning resources and is utilized as input by the International Atomic Energy Agency (IAEA) in regional capacity assessments (114).
- A priority in the Croatian NCCP is to improve access to the latest medical technologies (5). In addition, as part of the National Recovery and Resilience Plan approved in December 2023, advanced radiation therapy equipment for all five clinical hospital centers and the general hospital in Zadar will be acquired, including 21 linacs (including four with stereotactic capabilities) (11).

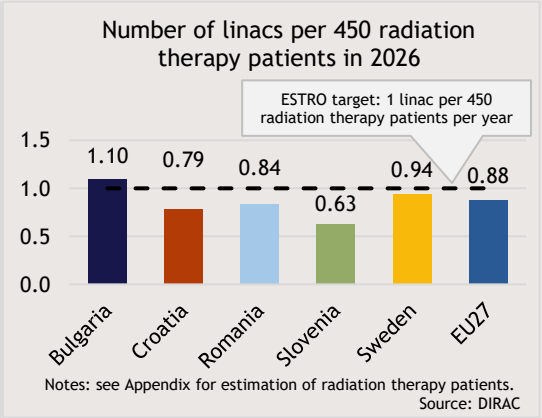
Current status in Croatia

- In 2023, Croatia had 7.3 radiation therapy machines per 1 million inhabitants, below the EU average of 8.0 and Bulgaria's 11.5 but above Romania (5.3), Slovenia (6.6) and Sweden (6.5), according to Eurostat data (109). Following a sharp decline after 2016, the number of radiation therapy machines has gradually recovered to the level seen in 2013 (109).



- As of March 2026, Croatia performs well in international comparison of the availability of linacs, with 7.7 machines per 1 million inhabitants, according to the IAEA's Directory of Radiotherapy Centers (DIRAC) (116). This is the highest number among comparator countries and just above the EU average of 7.5 linacs per 1 million (116). Croatia also has 1.8 brachytherapy machines per 1 million inhabitants, above the EU average of 1.7 and most comparator countries (116). Croatia falls slightly short of the ESTRO recommendation of one linac machine per 450 cancer patients requiring radiation therapy per year (see Appendix for clarification), with the Croatian ratio of 0.79 being below the EU average (0.88) but above Slovenia's ratio (0.63).
- Croatia has (as of March 2026) ten radiotherapy centers spread across the cities of Osijek [1 center], Rijeka [1], Split [1], Zabok [1], Zadar [1], and Zagreb [5] (116). Each Clinical Hospital Center (KBC) has at least one radiotherapy department. Brachytherapy machines are located in Osijek, Split, and Zagreb (116). However, there is limited information on how the machines are used and whether patients receive timely and equitable access.





Recommendations

- Ensure that the recent geographic expansion of new radiation therapy machines is combined with optimized patient flows.
- Ensure availability of brachytherapy machines in all KBCs.

Diagnosis and treatment

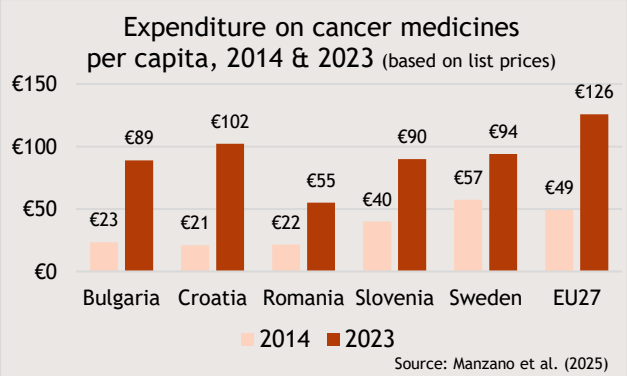
Uptake of novel cancer medicines

Background

- More than 100 new cancer medicines have been approved by the European Medicines Agency (EMA) between 2015 and 2024, which have transformed treatment standards across many cancer types (17). These primarily include immunotherapies, which enhance the immune system's ability to attack cancer cells, and targeted therapies, which focus on specific mutations that drive tumor growth. Ensuring that new, effective medicines are accessible and prescribed is essential to realizing their full potential.
- At the EU level, a revision of the EU pharmaceutical legislation is underway, where one main objective is to reduce country differences in the availability of new medicines and to shorten the time from EMA approval until patient access (117). On 12 January 2025, the EU HTA Regulation (HTAR) entered into application for cancer medicines, introducing a joint (cross-country) clinical assessments of the effectiveness of new treatments (118).
- The NCCP encompasses a vision for access to systemic cancer treatments by 2030. Specific objectives include ensuring administrative support by the Ministry of Health regarding compassionate use programs, incentivize access to new medicines and a more beneficial approval system. These objectives are supported by concrete activities such as the establishment of a new system for the approval of cancer medicines and a system to control their applications as well as inpatient daycare facilities for the administration of medicines (5).

Current status in Croatia

- After EMA approval, reimbursement by the Croatian Health Insurance Fund (HZZO) is the first step for patients to get broad access to new medicines. According to the EFPIA WAIT survey, Croatia reimbursed 30% of all new cancer medicines approved by the EMA in 2020-2023 at the beginning of 2025, which is below the EU average of 50%, although the Croatian data is partially incomplete (119). The mean time from EMA approval to reimbursement in Croatia was 636 days, above the EU average of 586 days (119). In an analysis by the OECD of novel medicines in breast and lung cancer in 2023, Croatia reimbursed more than 60% of EMA-approved indications in on average fewer than 400 days, which put Croatia behind Bulgaria and Slovenia that reimbursed 85% and 70% of indications, respectively (20).



- Croatia spent €102 per capita on cancer medicines (not taking into account confidential rebates on medicine prices) in 2023, which was a big increase since 2014 (€21), but still less than the EU average (€126 in 2023), yet more than the other comparator countries (17). A previous analysis has shown that European countries that spend more on cancer medicines per cancer case also achieve better outcomes (19).
- The uptake of novel cancer medicines – measured in sold volumes (milligrams) per cancer case – differed widely across European countries in 2023 (17). Of 27 countries, Croatia ranked in 21st place, behind Sweden (6th place), Bulgaria (7th place), Slovenia (8th place), and Romania (19th place). Across 12 cancer types and product classes, Croatia only had higher uptake levels than the EU average for breast cancer, non-Hodgkin lymphoma, and tumor-agnostic therapies. Compared to the year 2018, the Croatian overall uptake level improved relative to other countries (33% in 2018, 40% in 2023) (re-calculations of data in Hofmarcher et al. (2019) (120).

Overall uptake of novel cancer medicines in 2023

Rank	Country	Uptake level
1	Austria	88%
...		
6	Sweden	57%
7	Bulgaria	54%
8	Slovenia	54%
...		
19	Romania	42%
...		
21	Croatia	40%
...		
27	Latvia	23%
-	EU-27	54%

Source: Manzano et al. (2025)

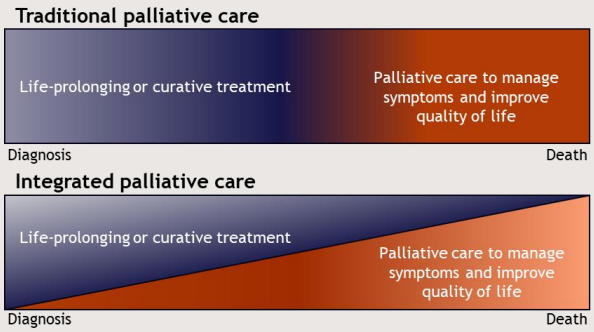
Recommendations

- Ensure the implementation of the suggested activities in the NCCP to improve the accessibility of new medicines.
- Leverage the application of the 2025 EU HTA regulation as an opportunity to review the national HTA process for cancer medicines. This could include a review of the evidence requirements and to what extent the national clinical assessment can be replaced by the joint EU clinical assessment of relative effectiveness.
- Monitor the uptake of new cancer medicines at the hospital level in relation to the patient numbers to measure differences in prescribing patterns and allow for quality improvements.

Survivorship
Palliative care services

Background

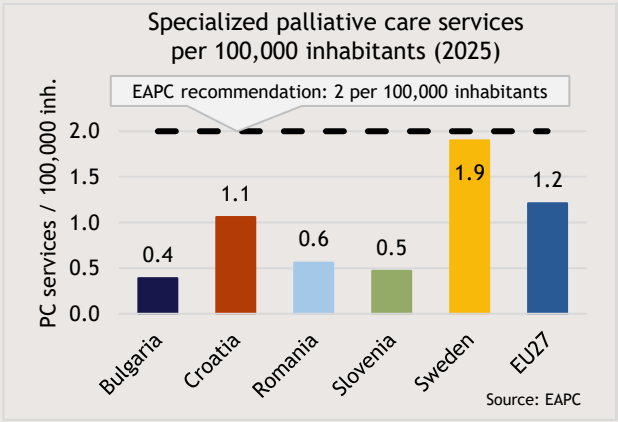
- In 2024, almost a quarter (23%) of Croatia's population was aged 65 or older (121). This share has increased every year since 2004 (17%), reflecting a sustained trend of population aging and pointing to a growing demand for palliative care (PC) services.
- Cancer is the most frequent cause of need for PC among life threatening or life-limiting health conditions (122). Within oncology, PC has traditionally had a strong focus at the end of life, but more recently there is a shift of integrating it earlier in the disease pathway (123).

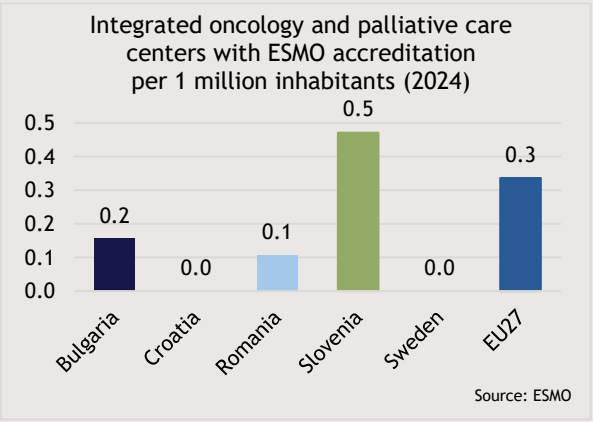


- The availability of PC services in a country is one metric to assess the capacity and potential access to PC. Another metric is the degree to which PC is integrated with the overall healthcare system (124). The European Association for Palliative Care (EAPC) recommends two specialized PC services per 100,000 inhabitants (125).
- In the Croatian NCCP, the importance of PC is recognized by analyzing the current availability of PC services and including a vision of equal access to high-quality PC which is integrated into all levels of the healthcare system. The vision is accompanied by measures and activities such as establishing new palliative institutions and mobile palliative teams based on the number of residents in the respective counties and the education of healthcare staff in PC (5).

Current status in Croatia

- In Croatia, PC has been developed since 2014 as an integrated comprehensive care model including both health care and social welfare (126). With planning and implementation phases stretching from 2014-2020, Croatia has made progress with the implementation of its PC reform. For instance, the number of counties with a county coordination center and a PC mobile home team have increased from 5 and 21 in 2016 to 17 and 33 in 2020, respectively. The number of counties with one hospital PC team in each acute care hospital has remained the same, while the target of 80 PC beds per one million population was exceeded (28 in 2016 to 88 in 2020) (126).
- According to the EAPC, Croatia has approximately 1.1 specialized (non-cancer-specific) PC services per 100,000 inhabitants in 2025, an increase from 0.8 in 2019 (122, 125). This is higher than the comparator countries Bulgaria (0.4), Romania (0.6) and Slovenia (0.5), but lower than the EU average (1.2) and Sweden (1.9) and below the EAPC recommendation of 2 per 100,000 (122).
- Based on a voluntary ESMO accreditation system of cancer centers, a comparison of the integration of PC with cancer care can be made. At present, Croatia, like Sweden, does not have any Integrated Oncology and Palliative Care Centers (127). The EU average is 0.3 centers per 1 million inhabitants, and all other comparator countries have such centers (0.2 in Bulgaria, 0.1 in Romania and 0.5 in Slovenia).





Recommendations

- Continue the successful implementation of the PC reform and ensure an adequate and optimally distributed PC workforce to meet the growing demand from an aging population and to support person-centered delivery of PC across all settings.
- Align national efforts with the EAPC recommendation of two specialized PC services per 100,000 inhabitants.

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Appendix: Methodology and sources for indicators

Governance	
National cancer plan	Analysis of the National Cancer Control Plan 2020-2030 (5). **For dashboard overview:** Presence of a national cancer plan in 2025 (yes = at benchmark).
Disease burden	
New cases (incidence)	1st, 2nd, 3rd, 4th graph: Croatian National Cancer Registry via ECIS (7). 5th graph: Croatian National Cancer Registry via ECIS (7), and estimates from ECIS for other countries (8). 6th graph: Croatian National Cancer Registry via ECIS for 2008-2022 (7), Ferlay et al. (2010, 2013, 2018) for EU in 2008-2018 (128-130) and ECIS for 2022 (8), ECIS for all in 2025-2040 (9).
Deaths (mortality)	**For dashboard overview:** • Incidence crude rate per 100,000 inhabitants in 2022, All sites but non-melanoma skin, All ages, Both sexes. Real data from Croatian National Cancer Registry and estimates for EU27 (7, 8). • Mortality crude rate per 100,000 inhabitants in 2022, All sites but non-melanoma skin, All ages, Both sexes. Real data from Croatian National Cancer Registry and estimates for EU27 (7, 8).
Survival rates	1st graph: CONCORD-3 study (10). Unweighted EU average was calculated based on countries with available data. 2nd graph: Croatian National Cancer Registry via OECD (11). **For dashboard overview:** Weighted (based on cancer incidence in 2022 (7, 8)) average of 5-year age-standardized net survival rates of breast, colon, lung, and prostate cancer in the diagnosis period 2010-2014 (10).
Economic burden	
Health spending on cancer	Data on the economic burden of cancer in Croatia in 2018 were sourced from Hofmarcher et al. (2020) (16). Data on the healthcare and cancer care expenditure, as well as the cost of lost productivity among working-age patients, in 2023 were sourced from Manzano et al. (2025) (17); values for 2000 to 2020 are unpublished data from Manzano et al. (2025) (17). **For dashboard overview:** • Healthcare spending on cancer per capita in EUR in 2023 (PPP-adjusted) (17). • Productivity losses from cancer per capita in EUR in 2023 (PPP-adjusted) (17).
Productivity losses from cancer	
Research	
Clinical trials	1st graph: Hofmarcher et al. 2024 (20). Data include interventional phase I, phase I/II, phase II, phase II/III, and phase III trials in oncology (neoplasms) in adult patients starting between 1st June 2009 to 1st June 2019 and registered in the ClinicalTrials.gov database. Data unavailable for CY and MT. Unweighted EU average. 2nd graph: EU Clinical Trials Information System (23). Specification: Medical condition = "cancer", Only show recruiting = yes. Data include currently recruiting interventional clinical trials in oncology as of September 8, 2025. Data unavailable for Malta. Population data were sourced from Eurostat (131). **For dashboard overview:** Number of clinical trials in cancer per 100,000 inhabitants in 2009-2019 (20).
Prevention	
Tobacco smoking	1st graph: Eurostat (34). Daily smokers of cigarettes by sex, age and educational attainment level. Specifications: daily smokers total, all education levels, all sexes, 2014 and 2019. 2nd graph: Tax Foundation (37). **For dashboard overview:** Prevalence of daily smokers among adults in 2019 (34).
Overweight and obesity	1st & 2nd graph: WHO (46, 47). Prevalence of overweight among adults aged 18+, BMI ≥ 25 (age-standardized estimate) (%) and Prevalence of obesity among adults aged 18+, BMI ≥ 30 (age-standardized estimate) (%). Specifications: Both sexes, 2013-2022, %. Unweighted EU average. **For dashboard overview:** Prevalence of obesity in adults in 2022 (47).
HPV vaccination	1st graph: Raic et al. (2025) (53). Graphical presentation of Table 2. 2nd graph: WHO (58). Human Papillomavirus (HPV) vaccination coverage. Specification: HPV vaccination program coverage, last dose, females. Unweighted EU average. **For dashboard overview:** HPV vaccination program coverage, last dose, girls in 2024 (58).
Early detection	
Breast cancer screening	1st graph: Supe Parun et al. (2022) (64). 2nd graph: Eurostat (65). Specification: Preventive cancer screenings - programme data; Malignant neoplasm of breast; Females. Numbers show the share of women who have been screened for breast cancer within the past two years (or per national screening interval), presented as a proportion of those eligible for an organized programme in the given country. Data unavailable for BG, PT, and RO. Unweighted EU average. 3rd graph: Eurostat (66). Specification: Self-reported last breast examination by X-ray among women by age and educational attainment level; Croatia; age 50-69 years; within "less than 2 years"; All ISCED 2011 levels; percentage; 2019. **For dashboard overview:** Breast cancer screening rate in 2023 (65).

Cervical cancer screening	1st graph: Eurostat (76). Specification: Self-reported last cervical smear test among women by age and educational attainment level; Croatia; age 20-69; within "less than 3 years"; All ISCED 2011 levels; percentage; 2019. Unweighted EU average. 2nd graph: Eurostat (76). Specification: Self-reported last cervical smear test among women by age and educational attainment level; Croatia; age 20-69; within "less than 3 years"; 2019. **For dashboard overview:** Self-reported cervical screening participation rate in 2019 (76).
Colorectal cancer screening	1st graph: Eurostat (65). Specification: Preventive cancer screenings - programme data; Malignant neoplasm of colon, rectosigmoid junction, rectum, anus and anal canal; males and females ("Total"). Numbers show the share of men and women who have been screened for colorectal cancer within the past two years (or per national screening interval), presented as a proportion of those eligible for an organized programme in the given country. Data unavailable for BG, DE, EL, CY, AT, PL, PT, and RO. Unweighted EU average. 2nd graph: Eurostat (85). Specification: Self-reported last colorectal cancer screening test by sex, age and educational attainment level; Croatia; age 50-74; males and females ("Total); within "less than 2 years"; All ISCED 2011 levels; percentage; 2019. **For dashboard overview:** Colorectal cancer screening rate in 2023 (65).
Lung cancer screening	1st graph: Data from Croatia's national screening program from Prof. Miroslav Samaržija (94, 95), and e-mail correspondence with the Coordination Team of the Croatian National LC Screening Program in November 2025; Data from Bulgaria and Romania from Appendix in Hofmarcher et al. (2022) (88). **For dashboard overview:** Number of people screened between October 2020 and October 2024 (compared to the aim of 30,000 people) [e-mail correspondence with the Coordination Team of the Croatian National LC Screening Program in November 2025].
Diagnosis and treatment	
Health workforce	1st graph: Eurostat (102). Health personnel. Specification: Practising; Physicians; per hundred thousand inhabitants. Unweighted EU average with missing data for Greece, Portugal, Slovakia and missing values in certain years for other countries approximated by latest available year. 2nd graph: Eurostat (103). Physicians by category. Specification: Generalist medical practitioners; per hundred thousand inhabitants. Unweighted EU average with missing data for Slovakia and missing values in certain years for other countries approximated by latest available year. 3rd graph: Eurostat (104). Physicians by medical speciality - historical data (1985-2016); Radiology, Haematology, Pathology; per hundred thousand inhabitants. Unweighted EU average with missing data for Czechia, Denmark, Hungary, Finland, Sweden, and Slovakia for all specialties and Netherlands for hematology. 4th graph: Eurostat (102). Health personnel. Specification: Practising; Nurses (EU recognised qualification); per hundred thousand inhabitants. Unweighted EU average with missing data for Portugal and Slovakia and missing values in certain years for other countries approximated by latest available year. **For dashboard overview:** Mean of the two relative differences in practicing physicians and nurses per 100,000 inhabitants in 2023 (102).
Diagnostic imaging equipment	1st graph: Data from 2nd and 3rd graphs. See below. 2nd graph: Eurostat (109). Devices for medical imaging. Specification: Hospitals and providers of ambulatory health care; Computed Tomography Scanners, Magnetic Resonance Imaging Units, and PET scanners; per 100,000 inhabitants. For countries missing data for "Hospitals and providers of ambulatory health care", either data for "Hospitals" or "Providers of ambulatory health care" were used. Unweighted EU average. 3rd graph: Eurostat (110). Medical technologies - examinations by medical imaging techniques (CT, MRI and PET). Specification: Hospitals and providers of ambulatory health care; per 100,000 inhabitants. For countries missing data for "Hospitals and providers of ambulatory health care", either data for "Hospitals" or "Providers of ambulatory health care" were used. Unweighted EU average with missing data for Ireland and Sweden. **For dashboard overview:** Sum of the number of CT, MRI, PET scanners per 100,000 inhabitants in 2023 (109).
Radiation therapy machines	1st graph: Eurostat (109). Devices for medical imaging. Specification: Hospitals and providers of ambulatory healthcare; Radiation therapy equipment; per 100,000 inhabitants. For countries missing data for "Hospitals and providers of ambulatory health care", either data for "Hospitals" or "Providers of ambulatory health care" were used. Unweighted EU average with missing data for the Netherlands and missing values in certain years for other countries approximated by latest available year. 2nd graph: IAEA DIRAC (116). Linac = "MV Therapy", Brachytherapy = "Brachy-Therapy". Data for 2026 or latest available year. Population data were sourced from Eurostat (131). Weighted EU average. 3rd graph: own calculations based on IAEA DIRAC data on linac availability ("MV Therapy"); data for 2026 or latest available year (116). Estimates of annual patients requiring radiation therapy were derived from cancer incidence (2022, all sites excluding non-melanoma skin, from IARC-GLOBOCAN (132)), assuming a radiation therapy utilization of 50% and applying a 1.25 retreatment factor; see Slotman et al. (2005) (115). Weighted EU average. **For dashboard overview:** Number of linac machines per 450 radiation therapy patients in 2026 (116, 132).
Novel cancer medicines	Graph: Manzano et al. (2025) (17). Figure 59 - Expenditure on cancer medicines per capita (in 2023 price levels and exchange rates; based on list prices), 2014 and 2023. Table: Manzano et al. (2025) (17). Figure 91: Overall uptake of newer cancer medicines in Europe in 2023. The rank is based on an index that considers the uptake of newer cancer medicines across

	12 categories (breast cancer, prostate cancer, lung cancer, gastrointestinal cancers, melanoma, urinary tract cancers, gynecological cancers, tumor-agnostic therapies, non-Hodgkin lymphoma, leukemia, and multiple myeloma), each expressed as sales in standard weekly doses (milligrams as per recommended dosing schedule) per cancer case. For each category, the uptake level in a country compared to the country with the highest uptake level was calculated. The arithmetic mean of the relative uptake level across all 12 categories was calculated to determine the overall ranking of a country. **For dashboard overview:** Mean of the relative uptake of novel cancer medicines (standardized weekly doses per cancer case) across 12 categories in % compared to the highest-uptake country in each category in 2023 (17).
Survivorship	
Palliative care services	1st graph: EAPC Atlas of Palliative Care (122). Palliative care specialised services per 100,000 inhabitants, p.71. Unweighted EU average. 2nd graph: ESMO website (127). ESMO Accredited Designated Centers. Population data were sourced from Eurostat (131). **For dashboard overview:** Number of specialized palliative care services per 100,000 inhabitants in 2025 (122).


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