European Cancer Inequalities Registry

GREECE

Country Cancer Profile

2023

European Commission

OECD

BETTER POLICIES FOR BETTER LIVES

The Country Cancer Profile Series

The European Cancer Inequalities Registry is a flagship initiative of the Europe's Beating Cancer Plan. It provides sound and reliable data on cancer prevention and care to identify trends, disparities and inequalities between Member States and regions. The Country Cancer Profiles identify strengths, challenges and specific areas of action for each of the 27 EU Member States, Iceland and Norway, to guide investment and interventions at the EU, national and regional levels under the Europe's Beating Cancer Plan. The European Cancer Inequalities Registry also supports Flagship 1 of the Zero Pollution Action Plan.

The Profiles are the work of the OECD in co-operation with the European Commission. The team is grateful for the valuable inputs received from national experts and comments provided by the OECD Health Committee and the EU Expert Thematic Group on Cancer Inequality Registry.

Data and information sources

The data and information in the Country Cancer Profiles are based mainly on national official statistics provided to Eurostat and the OECD, which were validated to ensure the highest standards of data comparability. The sources and methods underlying these data are available in the Eurostat Database and the OECD Health Database.

Additional data also come from the World Health Organization (WHO), the International Agency for Research on Cancer (IARC), the International Atomic Energy Agency (IAEA), the Institute for Health Metrics and Evaluation (IHME) and other national sources (independent of private or commercial interests). The calculated EU averages are weighted averages of the 27 Member States unless otherwise noted. These EU averages do not include Iceland and Norway.
Purchasing Power Parity (PPP) is defined as the rate of currency conversion that equalises the purchasing power of different currencies by eliminating the differences in price levels between countries.

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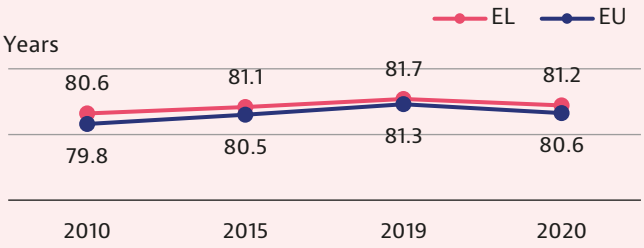

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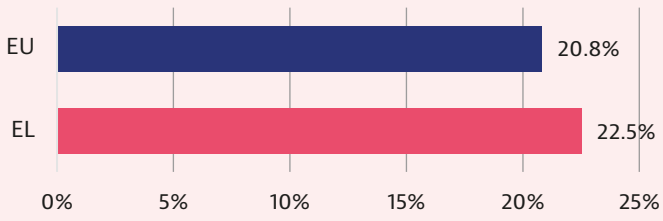

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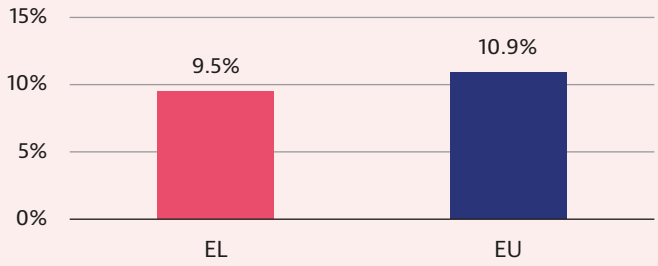
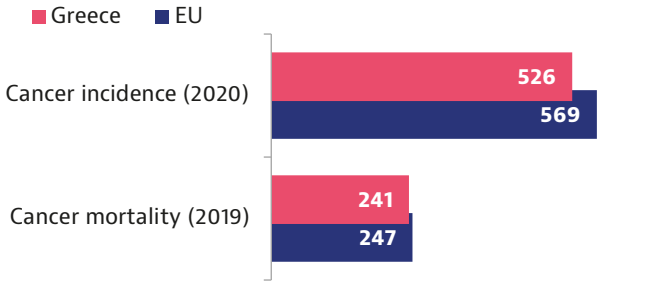


Source: Eurostat Database.

1. Highlights



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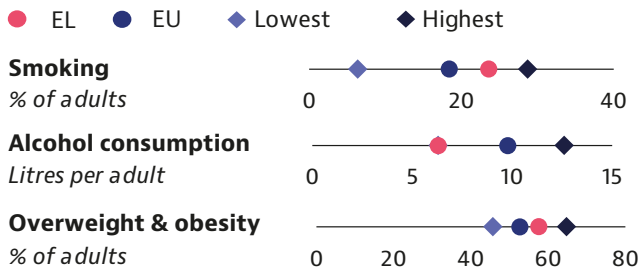
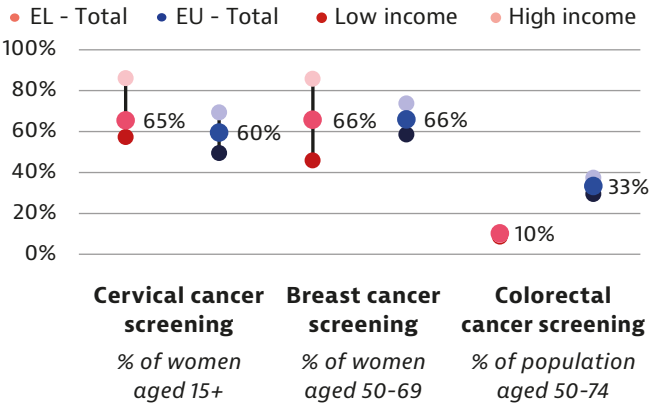
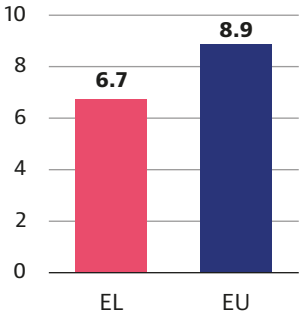
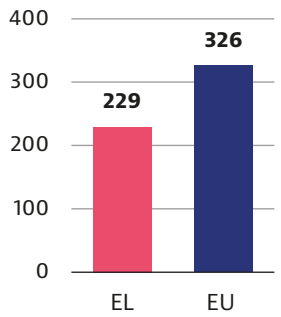






Number of radiation therapy centres per 100 000 population, 2007-22



Total cost of cancer (EUR per capita PPP), 2018

Cancer in Greece

An estimated 62 500 new diagnoses of cancer were expected in Greece in 2020, corresponding to age-standardised incidence rate of 526 new cases per 100 000 population, which is lower than the EU average. However, the reductions in cancer mortality have been slower in Greece than in the EU. Overall, cancer in Greece accounted for one in four deaths in 2019, with lung cancer being the main cause of death by any type of cancer.

Risk factors and prevention policies

Although smoking in Greece has declined during the last two decades, one in four adults smoked daily in 2019 – one of the highest rates among EU countries. Further, a decade of financial austerity had a profound impact on social determinants of health in Greece, especially among the poorest population groups, undermining efforts to minimise incidence of preventable risk factors through adoption of healthier lifestyles, and curtailing public cancer prevention programmes.

Early detection

Greece has been unable to develop comprehensive cancer screening programmes, which in addition to the consistent lack of a national cancer strategy, results in poor outcomes of early cancer detection. The vast majority of screening tests are performed on an opportunistic basis, with a large share paid out of pocket. Consequently, significant disparities exist between the lowest and highest income groups, as well as between urban and more remote areas.

Cancer care performance

Access to cancer care in Greece is impaired by several factors. These include the limited size of the public health system after consecutive budgetary cuts due to austerity measures, the lack of a national cancer strategy and a national cancer registry, a shortage of specialised workforce and gaps in medical training in oncology. Long waiting times and backlogs push patients towards the private sector, at their own costs. Human and physical resources providing oncology services are also limited, unevenly distributed throughout the country and misaligned. Surveillance mechanisms are not implemented, and evidence on quality of care is scarce. These issues create substantial barriers – particularly for marginalised, underserved and isolated populations.

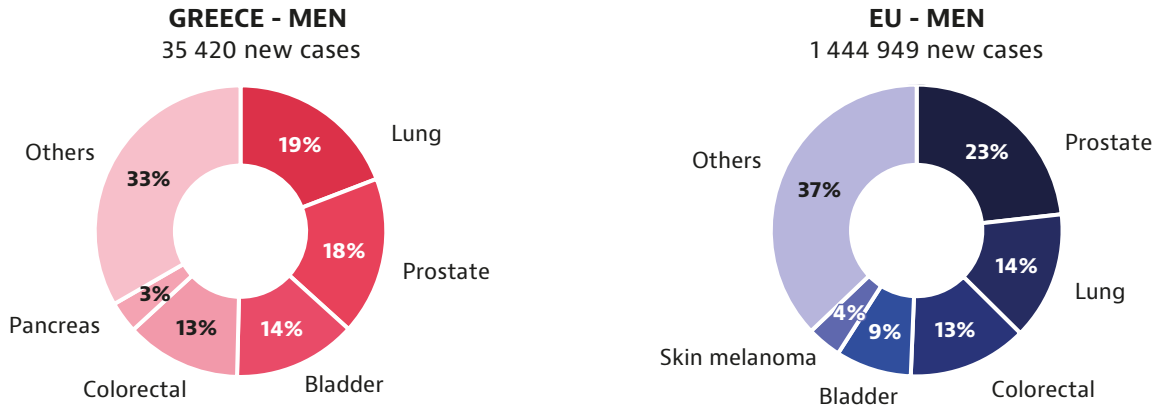
2. Cancer in Greece

Overall cancer incidence in Greece is among the lowest in the EU

According to European Cancer Information System (ECIS) of the Joint Research Centre based on incidence trends from pre-pandemic years, approximately 62 500 new cancer cases were expected in Greece in 2020. The age-standardised incidence rate for all cancer sites was lower than the EU average, at 526 vs. 559 cases per 100 000 population. Notably, the four most frequent cancer types for both sexes account for half of all cancers: lung (14 %), colorectal (13 %), breast (12 %), prostate (10 %) and bladder cancer (9 %). Lung cancer was the main type among men (19 %), followed by prostate (18 %) and bladder cancer (14 %). Breast cancer was the main type among women (29 %), followed by colorectal (12 %) and lung cancer (9 %) (Figure 1). New cancer cases among men are expected to rise by approximately 20 % between 2020 and 2040 (from 35 000 to 44 000 cases) and by 12 % among women (from 27 000 to 30 000 cases) respectively.

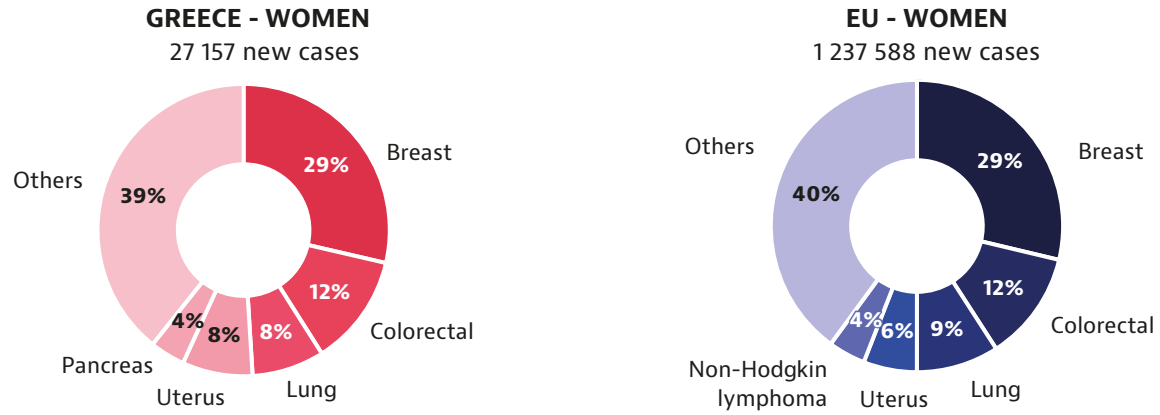
Figure 1. Approximately 62 000 new cancer cases were expected in Greece in 2020

Distribution of cancer incidence by sex in Greece and the EU



AGE-STANDARDISED RATE (ALL CANCER)

Greece	659 per 100 000 population
EU	686 per 100 000 population



AGE-STANDARDISED RATE (ALL CANCER)

Greece	422 per 100 000 population
EU	484 per 100 000 population

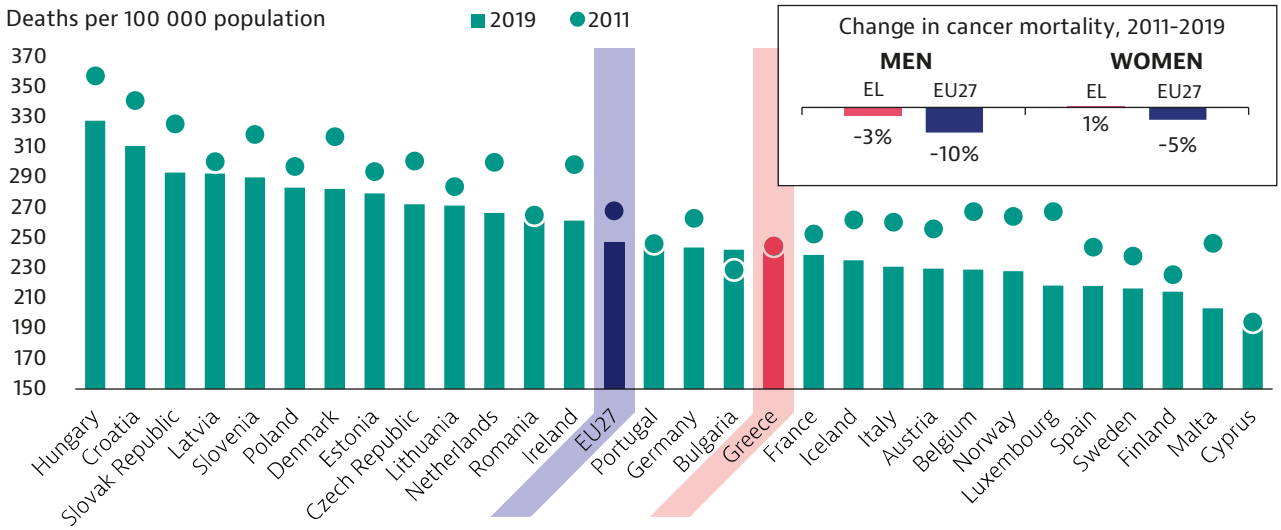
Note: Corpus uteri does not include cancer of the cervix. These estimates were created before the COVID-19 pandemic, based on incidence trends from previous years, and may differ from observed rates in more recent years.
Source: European Cancer Information System (ECIS). From https://ecis.jrc.ec.europa.eu, accessed on 09/05/2022. © European Union, 2022.

In 2020, gastric (stomach) cancer was expected to constitute 3 % of new cancer cases among men and 2 % among women, and it accounted for an overall mortality rate of 10 per 100 000 population in 2019, which is similar to the EU average. Skin melanoma was expected to constitute 2 % of new cancer cases in both men and women, and it accounted for an overall mortality rate of 2 per 100 000 population in 2019. For paediatric cancer, the age-standardised incidence rate in children under 15 years in 2020 was 16 per 100 000, which is higher than the EU average (15 per 100 000 population).

Cancer is a major driver of mortality in Greece

Although reporting issues exist in Greece, in absolute numbers one in four deaths in 2019, was related to cancer (31 000 of 125 000 deaths). When age-standardised, the overall mortality rate by cancer in Greece was 241 deaths per 100 000 population in 2019, which is slightly lower than the EU average of 247 per 100 000 population. However, over the past 10 years reductions in cancer mortality have been slower in Greece than in the EU (Figure 2) and overall mortality due to cancer has increased during the financial crisis (Box 1).

Figure 2. Cancer mortality in Greece is slightly below the EU average but reductions have been slower



Note: The EU average is weighted (calculated by Eurostat for 2011-2017 and by the OECD for 2018-2019).
Source: Eurostat Database.

The annual probability of premature death by any type of cancer dropped marginally from 7.6 % in 2000 to 7.5 % in 2015, but it is estimated to increase to almost 8 % in 2030 – way above the 5.1 % of Sustainable Development Goal (SDG) target 3.4[1] (WHO, 2020). Potentially avoidable premature mortality is linked to important structural challenges, including workforce issues in diagnostic and treatment units; outdated infrastructure; fragmentation of services; uneven distribution of resources; poor prevention; lack of cancer screening and early detection strategies and programmes; and an increase in risk factors among the most vulnerable population groups.

In terms of geographical distribution of cancer mortality, the highest rate in Greece is in the Attiki region, which includes the capital, Athens (255 deaths per 100 000 population for both sexes and all ages in 2019). This is partly linked to the concentration of hospitals in the region. The second highest mortality rate is Central Macedonia region, which includes the second largest city, Thessaloniki (250 deaths per 100 000 population). The regions of Northern Aegean and Epirus have the lowest rates, at 201 and 206 per 100 000 population.

Overall during 2000 and 2018, potential years of life lost due to malignant neoplasms saw the lowest relative decrease among EU countries of around 10 %, and it accounted for 1 322 years of life lost among 100 000 people aged up to 75 years in 2019. The relative decrease was larger among men (14 %) than women (4 %), with 1 599 and 1 074 years of life lost in 2018, respectively.

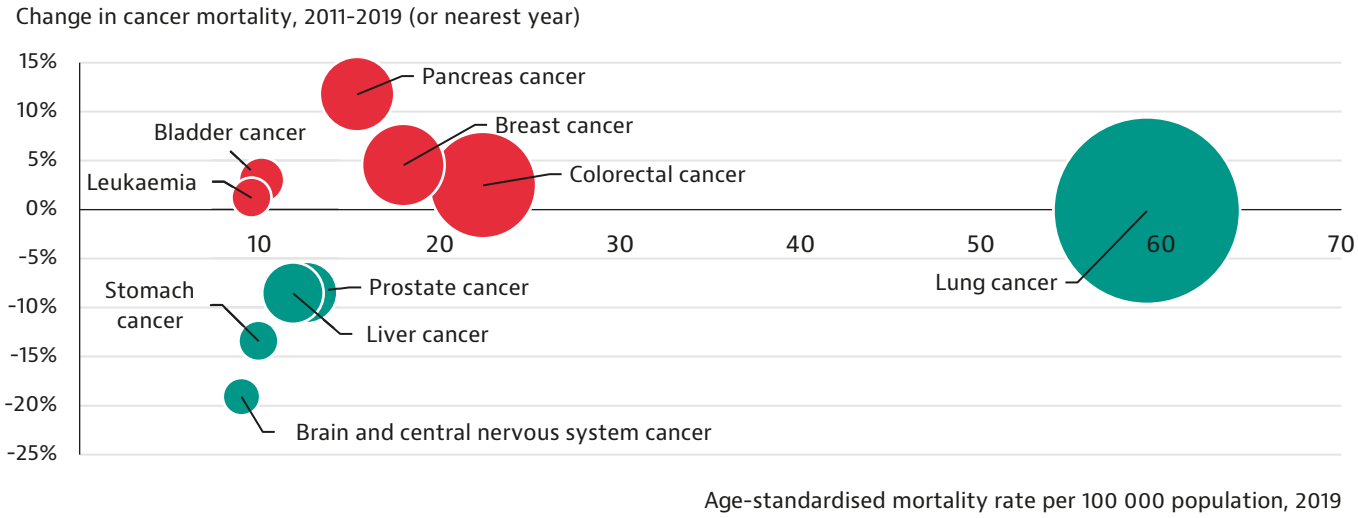
Lung and colorectal cancers are the leading causes of death by cancer in Greece

In 2019, lung cancer was the main cause of death by any type of cancer in Greece, responsible for

1 *SDG target 3.4: by 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.*

approximately 59 deaths per 100 000 population (Figure 3). Lung cancer accounts for 5.7 % of all deaths and it remains the third leading cause of death overall, preceded only by heart and cerebrovascular diseases (ELSTAT, 2022). This situation may be explained in part by high smoking prevalence among the Greek population (see Section 3). Lung cancer was already the largest cause of cancer mortality in 2011, indicating that neither measures nor legislation had been introduced to reduce smoking. In comparison, the average lung cancer mortality rate in the EU dropped from 55 deaths per 100 000 population in 2011 to 50 deaths per 100 000 in 2019.

Figure 3. Mortality has been increasing for a substantial number of cancer sites



Note: Red bubbles signal an increase in the percentage change in cancer mortality during 2011-2019; green bubbles signal a decrease. The size of the bubbles is proportional to the mortality rates in 2019. The mortality of some of these cancer types is low; hence, the percentage change should be interpreted with caution. Bubble sizes for mortality rates are not comparable between countries.
Source: Eurostat Database.

Box 1. The financial crisis had an impact on lung cancer incidence and mortality

The effects of the global and Greek financial crisis on health and social determinants of health among the Greek population has been demonstrated in several studies. Cancer is among the most affected non-communicable diseases during periods of recession. In Crete, for example, data show that the financial crisis led to a significant increase in lung cancer burden and associated risk factors, such as smoking and indoor and outdoor air pollution. More patients were diagnosed with lung cancer at late stages during than before the crisis; this is linked to weak early detection mechanisms and increased barriers in access. Women on low incomes were particularly affected by increasing mortality rates, which are partly attributed to social vulnerabilities such as higher unemployment rates and higher risk factors for health.

Source: Sifaki-Pistolla et al. (2022).

Colorectal cancer mortality has increased slightly over the past 10 years; it was the second leading cause of death by cancer, with 22 deaths per 100 000 population, in 2019. Between 2011 and 2019, pancreatic cancer mortality in Greece increased by 12 % and breast cancer mortality by 5 %, while these decreased across the EU. The increase in breast cancer mortality is particularly concerning, as major progress has been made in detection and treatment of this pathology.

The lack of an overarching national cancer strategy in Greece affects all aspects of cancer care

National cancer strategies and plans play a substantial role in addressing the cancer burden effectively and prioritising, organising and funding programmes. However, Greece has not developed or implemented an evidence-based overarching national cancer strategy or a cancer plan as part of a national non-communicable disease strategy.

The lack of an overarching cancer strategy has a severe impact on cancer burden, survival rates, cancer research, surveillance, prevention, early

detection, diagnosis, treatment, palliative care and quality of life for patients with a history of cancer. Only two cancer strategies have been developed in the past 15 years – the most recent for the period 2011-2015 (see Section 5.2). However, according to the strategy website, all action stopped before the end of 2012, and no outcomes or results are publicly available.

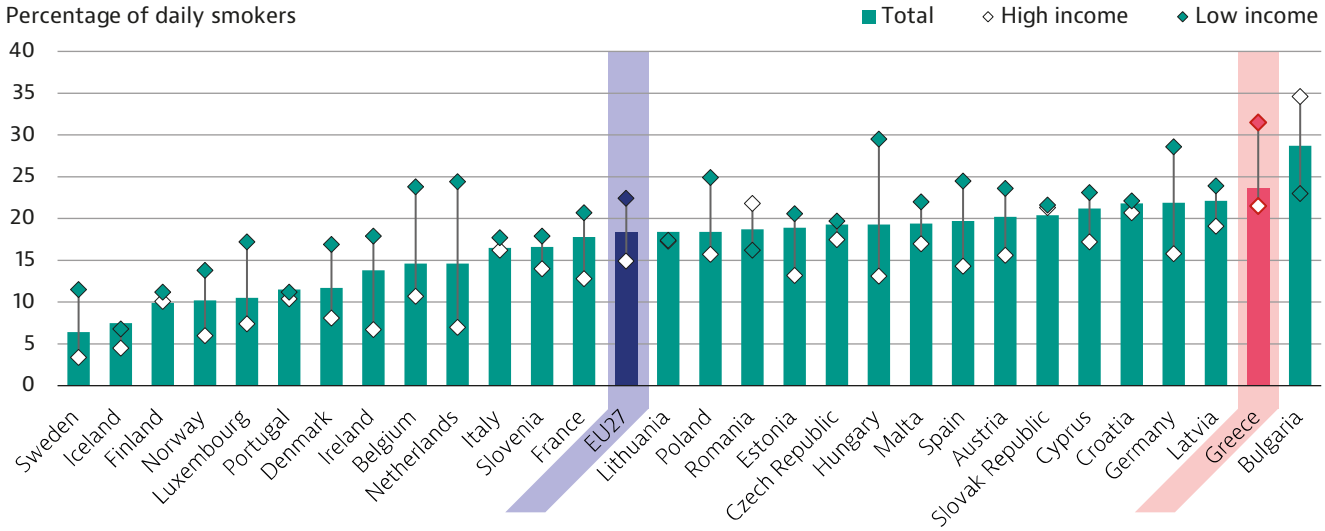
Overall, the country does not perform situational analyses, set priorities based on epidemiological evidence, budget for plans or allocate funds. It is worth noting that Greece does not have a national cancer institute or similar institutional body, and the 2019 law to establish the first national cancer institute has not yet been implemented. Moreover, the Hellenic Precision Medicine Network in Oncology, a flagship state initiative launched in 2018, completed its pilot phase at the end of 2021 but is currently not operational due to lack of both a legal framework and relevant funding.

3. Risk factors and prevention policies

Cigarette smoking rates are among the highest in the EU

Even though prevalence of smoking has declined in the last two decades, in 2019 almost one in four Greeks (24 %) smoked daily – the second highest rate in the EU after Bulgaria (Figure 4). As in many other countries, there is an important gender imbalance: the proportion of smokers among men is much higher (30 %) than among women (18 %). Social inequalities are also substantial: the proportion of smokers on low incomes is 10 percentage points higher than among those on high incomes.

Figure 4. Greece reports the second highest cigarette smoking rate in the EU



Note: The EU average is weighted (calculated by Eurostat).
Source: Eurostat Database, European Health Interview Survey (EHIS). Data refer to 2019.

Although smoking cessation appears to have been a positive by-product of the crisis, no tobacco control measures were introduced during 2010-2016. The latest legal framework was adopted in 2019, when the Greek government attempted to enforce a more comprehensive anti-smoking law, but this continues to face challenges, as it focuses more on retroactive actions and penalties rather than prevention (Box 2).

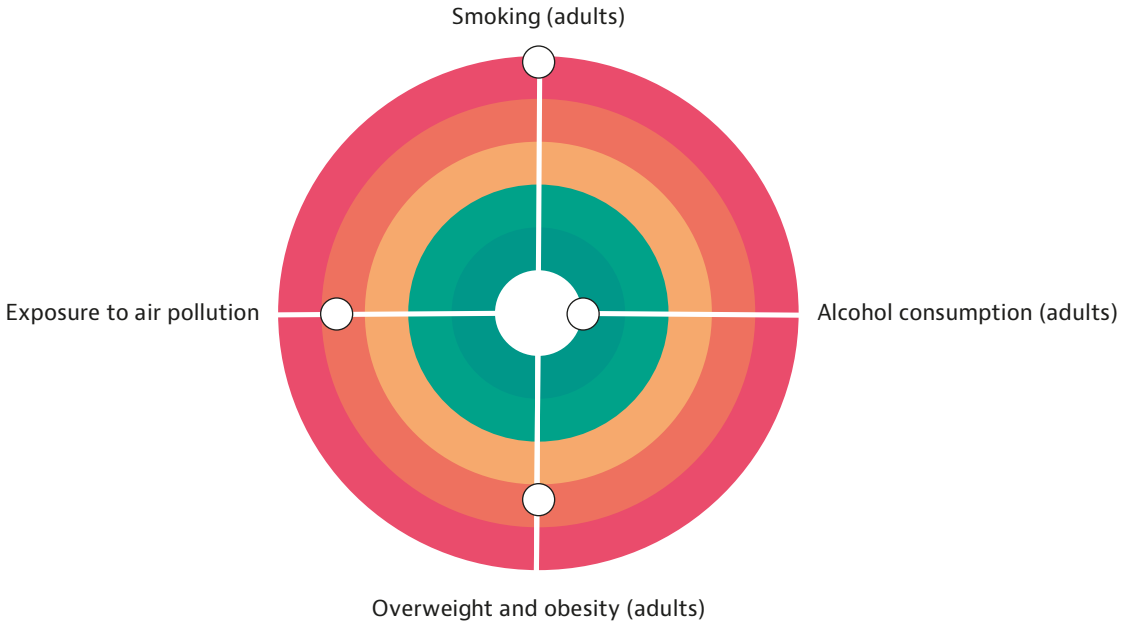
Box 2. The government has recently attempted to strengthen action against smoking

Greece has struggled to reduce smoking – especially in public places, including workplaces – for over two decades. In October 2019, the government introduced a more comprehensive anti-smoking law as part of a new tobacco control action plan, followed by enforcement measures and penalties. The legislation bans smoking in taxis, private vehicles with children, open-air sports arenas and playgrounds. Dedicated field inspectors monitored implementation in public indoor areas, including health care facilities, schools, restaurants and nightclubs. However, after successive COVID-19 lockdowns when businesses were shut down, monitoring of smoking in public spaces became less strict. Further, rules on vaping in public spaces are not widely clarified. In addition, smoking cessation services that could motivate and support people in quitting are scarce, and their services have not been strengthened. Overall, measures to reduce smoking have focused on retroactive rather than preventive policies.

Obesity is a major risk factor in Greece

In 2019, 58 % of Greek adults were overweight or obese – a proportion that has increased since 2014 (55 %), although at a lower rate than in the EU (53 %). Greece displays higher rates of overweight or obese adults than neighbouring Mediterranean countries with a similar diet, such as Italy (which has the lowest rate in EU at 46 %), Cyprus (50 %) and Spain (54 %). Overweight and obesity among adults is the third major risk factor after smoking and exposure to air pollution (Figure 5).

Figure 5. Smoking, air pollution and obesity are major risk factors in Greece



Note: The closer the dot is to the centre, the better the country performs compared to other EU countries. No country is in the white "target area" as there is room for progress in all countries in all areas.
Sources: OECD calculations based on the European Health Interview Survey (EHIS) 2019 for smoking and overweight/obesity rates, OECD Health Statistics 2022 and WHO Global Information System on Alcohol and Health (GISAH) for alcohol consumption (2020) and Eurostat for air pollution (2019).

As in other countries, poor nutrition is considered as the main factor contributing to overweight and obesity. Only 49 % of the Greek population consumed fruit at least once a day, which is lower than the EU average of 56 %. However, substantial disparities are reported between social groups with different educational attainment, which is also linked to socioeconomic status. Almost 70 % of people with lower education levels are overweight or obese compared with 50 % of those with higher education levels.

Healthy choices in diet and nutrition are influenced by income and affordability. Fiscal measures and reductions in household income during the financial crisis in Greece resulted in increased food insecurity, especially among older adults. Lower incomes and increased unemployment rates were linked to a substantial decrease in consuming nutritional products (Koulierakis et al., 2022).

The Ministry of Health has developed a series of informative presentations, banners and posters to promote healthy diet for children and adolescents, but most programmes are developed and implemented independently by non-governmental organisations (NGOs) and other initiatives. Moreover, the colour-coded labels on the front of food products (Nutri-score) adopted by some EU countries are not used in Greece (WHO Regional Office for Europe, 2022). In 2021, the National Public Health Action Plan 2021-2025 included a nutritional policy, divided into three categories: surveillance and monitoring, interventional policies with a focus on children and vulnerable groups, and collaboration of stakeholders.

Alcohol consumption is low compared to other EU countries, but alcohol-control policies are not in place

Greece has one of the lowest levels of alcohol consumption in the EU. During 2009-2019, it saw an overall drop in alcohol consumption from 8.3 litres to 6.3 litres of pure alcohol on average per year and per capita. The biggest proportion of alcohol users prefer beverages with lower alcohol volumes, like beer (45.5 %) and wine (31.5 %) (WHO Regional Office for Europe, 2019). In addition, only 6 % of Greek adults reported binge drinking in 2019, which is one of the lowest levels among EU countries. Men report binge drinking more often than women (9 % vs. 3 %).

Greece underperforms in the WHO "Best Buys" to reduce harmful use of alcohol. In 2019 a National Action Plan to Address the Harmful Consequences of Alcohol Use was developed by the Ministry of Health, but the plan has not been adopted or implemented.

Additional efforts are needed to reduce exposure to air pollutants

According to the Institute for Health Metrics and Evaluation, air pollution in the form of $PM_{2.5}$[2] and ozone exposure alone accounted for 5 % of all deaths in Greece in 2019. An important share of the population lives in cities, with almost half of all Greeks residing in the Athens capital area; this increases the risk of exposure to air pollution.

Greece was slow to adopt policies to reduce exposure to polluted air. In 2005 the population-weighted annual mean concentration of $PM_{2.5}$ was 29 µg/m^3, while the EU average was 16 µg/m^3. European Commission Directive 2008/50/EC required Member States to assess and reduce population exposure to concentrations of $PM_{2.5}$ by 2020. This contributed to a substantial reduction: in 2019, the $PM_{2.5}$ concentration in Greece was at 14 µg/m^3, but this remained above the EU average of 12.5 µg/m^3.

Exposure to ultraviolet (UV) radiation is among the causes of non-melanoma skin cancer for people who work in the open air. Programmes to reduce the risks of prolonged sun exposure are limited to recreational circumstances and do not cover outdoor employment/work. Moreover, although Greece has legally recognised UV radiation as a potential cause of skin cancer, the government does not recognise it as a professional health risk factor.

Underdeveloped information campaigns are one reason for low human papillomavirus vaccination uptake

The National Vaccination Committee has recommended vaccination against HPV for both girls and boys since 2008. Based on an analysis of prescribed HPV vaccines during 2017-2021, average coverage in girls is estimated at 55 % for ages 11-18 years and at 44 % for ages 11-14 years – significantly below the WHO target (90 % of girls aged up to 15 years by 2030). Low HPV vaccination coverage is partly linked to underdeveloped awareness campaign, and to cultural and social barriers. Participation rates in the vaccination programme have shown only a marginal improvement over the years, with a decreasing trend during the pandemic.

In 2022, the National Vaccination Committee revised its recommendations and now suggests that vaccination can start for both girls and boys at the age of 9 years – two years sooner than before – and up to 18 years. The HPV vaccine is fully reimbursed for boys and girls aged 9-18 years until the end of 2023; from 2024 only those aged 9-15 years will be reimbursed. Those not covered will have to pay for the vaccine out of pocket, which can cost between EUR 215 and EUR 450 for all doses, depending on the type of vaccine.

Multisectoral prevention policies are needed to tackle the major risk factors

Although lung cancer is the leading cause of preventable[3] mortality in Greece, and smoking rates are among the highest in the EU, policies to reduce smoking have largely been on banning and penalty

2 *Particulate matter (PM) is classified according to size: $PM_{2.5}$ refers to particles less than 2.5 micrometres in diameter.*

3 *Preventable mortality refers to malignant neoplasm of lip, oral cavity, pharynx, oesophagus, stomach, liver, trachea, bronchus and lung, cervix and bladder.*

approaches. A robust communication campaign, smoking cessation services and health literacy are lacking from actions taken by authorities.

The legal minimum age to buy alcohol in Greece is 18 years – both off- and on-premises[4] – but identification is rarely requested for transactions. Overall, no restrictions on hours, days, density or availability to intoxicated people apply to alcohol sales. There are also no legally binding regulations on advertisement and product placement, except on alcohol sponsorship and promotion in certain types of events. Prevention of overweight and obesity policies are also undeveloped, with responsibilities distributed across various institutions and ministries, and an overall lack of accountability and vision. Overall, in 2020, spending on prevention accounted for only 1.8 % of all health spending – a share lower than the 3.4 % EU average.

4. Early detection

Greece lacks an organised and comprehensive cancer screening strategy

Because of the absence of a national cancer strategy, Greece also lacks a national screening action plan, resulting in fragmentation of both implementation and funding activities. Most screening tests are performed on an opportunistic basis, mainly in the private sector. Greece has not implemented EU Council Recommendation on Cancer Screening of 2003, and it is not yet known whether the recent proposal of an EU Council Recommendation of 2022 on breast, colorectal, cervical cancer and lung, prostate and gastric (stomach) cancer will be implemented. As a result, significant inequalities exist in screening rates among social groups – especially between lower and higher income groups and between geographical regions. Furthermore, the lack of a national cancer registry and lack of infrastructure are barriers to fine-tuning screening programmes with target groups of high-risk population.

The Ministry of Health is responsible for managing and steering all screening activities and funding most of them (except those involving NGOs, patient associations and the private sector). Screening tests can be prescribed by a doctor through the e-prescription platform, and are covered by national health insurance, if the patient belongs to the eligible population. If the physician needs to proceed with further investigation based on the results, these costs are also covered. Recently, the National Action Plan for Public Health 2021-2025 identified the need to develop national screening programmes for cervical, breast and colorectal cancers in place of the current fragmented approaches.

Breast cancer screening rates are close to the EU average, but with inequalities across groups

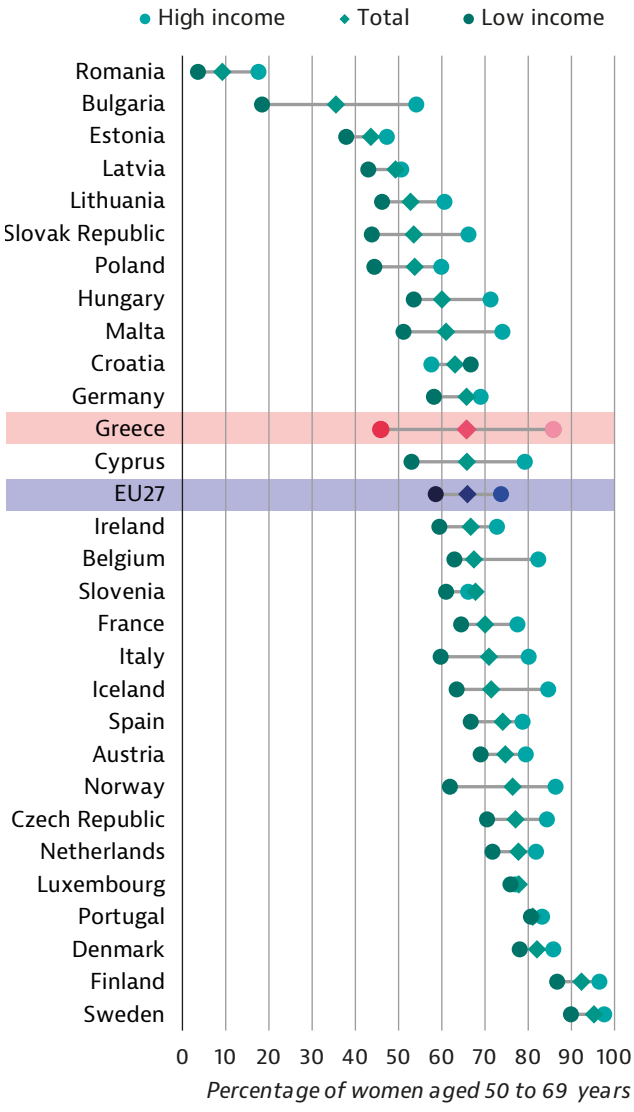
A population-based breast screening programme (screening offered to a specific at-risk target population) was introduced in Greece in 2018. Until 2022, women aged 40-49 years were covered for one mammogram every two years, and women aged 50 years and over for one mammogram every year. In 2022, however, the screening programme was modified to cover only women aged 50-69 years via Joint Ministerial Decision (27866/2022). According to the Ministry of Health, about 40 000 mammograms had been performed within the programme until October 2022, and 2 411 women had received early diagnoses – the majority of whom will not need a mastectomy or chemotherapy.

Although a population-based programme was introduced only recently, Greece reports screening rates close to the EU average. In 2019, 66 % of women aged 50-69 years reported breast cancer screening – similar to the EU average (Figure 6). Important disparities are identified across social groups. The proportion of women on higher incomes reporting breast examination was almost double (86 %) the proportion on lower incomes (46 %). A similar gradient also exists for education, in favour of women with the highest education levels.

4 *On-premises sales refer to sales in, for example, a café, pub, bar or restaurant, while off-premises sales mean sales to be taken away from, for example, a shop or supermarket.*

Further, in 2015, the European Commission started the European Commission Initiative on Breast Cancer, which developed new breast cancer screening guidelines and a quality assurance development scheme for breast cancer services in EU Member States. Greece neither followed the Initiative guidelines nor met the requirements for quality assurance, however. In reality, no quality assurance legislation is in place for diagnostic centres and laboratories.

Figure 6. Breast screening uptake is close to the EU average



Note: The EU average is weighted (calculated by Eurostat). The figure reports the percentage of women aged 50 to 69 years who reported receiving a mammogram in the past two years.
Source: Eurostat Database (EHIS). Data refer to 2019.

Overall cervical screening uptake is high in Greece with some substantial inequalities

Approximately 78 % of women aged 15 years and over in Greece reported in 2019 having had a cervical smear test within the last three years, which is significantly higher than the EU average of 68 %. Further, substantial inequalities are clear: the proportion of women with higher education levels who reported having taken a smear test (85 %) was more than double that of those in with lower education levels (39 %).

Especially during the financial crisis, only a third of the female population reported being screened for cervical cancer on a regular basis (Agorastos et al., 2014). Since most cervical screening is performed on an opportunistic rather than a population-based basis, the majority is performed in the private sector. Public ambulatory and primary care services are no longer equipped to provide smear tests. Public hospitals perform cervical cancer screening, but mostly in gynaecology departments, and the waiting time can be several months. This also leads also to inequalities among income groups, as only 57 % of those on lower incomes reported having a cervical cancer screening test, compared with 86 % of those on higher incomes.

The screening rate for colorectal cancer is among the lowest in the EU

In 2019, 10 % of the population aged 50-74 years reported having a colorectal cancer screening test in the past two years – one third the proportion across the EU (33 %). Such low levels are particularly worrying because colorectal cancer is one of the main causes of cancer death in Greece, and prevalence has increased in recent years (see Section 2). According to some sources (Public Health Action Plan: Discussion Paper, 2022), the degree of invasiveness of the colonoscopy discourages a large proportion of the population from having screening. This is partly linked to a lack of primary health care services and family medicine, which leads to low health literacy, distrust of health care services and general anxiety about the examination process. Colorectal screening is performed by specialist doctors, mostly in the private sector. People are either referred by their doctor or seek the service on their own, as waiting times in the public sector can also be substantial.

The European Commission Initiative on Colorectal Cancer began in June 2022, and is expected to deliver colorectal cancer screening guidelines and a quality assurance development scheme for colorectal cancer services by the end of 2024.

5. Cancer care performance

5.1 Accessibility

The 2008 economic crisis and related austerity measures have impacted access to cancer care

The impact of the 2008 financial crisis on the Greek population and health system was multifaceted. Aside from the socioeconomic consequences that had an impact on cancer-related risk factors, the health system was deeply affected by a series of budget cuts and specialised workforce outflow. Access to health services deteriorated, especially owing to the increasing unemployment rate and loss of health insurance coverage (Economou et al., 2017; Karanikolos and Kentikelenis, 2016). This had a significant impact on access to cancer care. At the peak of the crisis in 2014, cancer patients reported long waits and a lack of flexibility in getting appointments, long waiting times before being examined by a doctor (Pini et al., 2014) and severe barriers in access to cancer treatment and cancer-related drugs.

Limited social protection puts certain cancer patients at financial risk

Waiting times for cancer diagnosis and treatment in the public sector can be long in Greece. This, combined with an unregulated private health sector and lack of protective measures, has increased the share of out-of-pocket payments – especially among the poorest households, putting them at higher risk for catastrophic health expenditure (Thomson, Cylus & Evetovits, 2019). In addition, the rising costs of living, partly due to rising inflation, force households to miss early detection tests and postpone treatment. This is likely to have an impact on both incidence and survival rates.

Overall, the financial and social demands of cancer care affect the quality of life not only of patients but also of relatives and carers, with a ripple effect on social cohesion and the economy. According to research during the financial crisis and at the peak of unmet needs, among patients with early and locally advanced breast cancer, total mean private expenditure from diagnosis to end of treatment was estimated at EUR 4 706, over a 10.5-month average period. Almost half of households with a member presenting breast cancer spent more than 20 % of their total income on treatment; one in three households spent more than 50 % (Skroumpelos et al., 2016). These rates indicate that a significant proportion of the population remain at great risk of catastrophic expenditure if a household member has cancer. Households also face additional non-clinical costs due to inequalities in access, as discussed below. Similarly, during the COVID-19 pandemic, when many businesses shut down and a great percentage of the population lost their jobs as a result of the lockdowns, households had to both postpone cancer diagnoses and care (see Section 5.4) and seek money to fund care at private hospitals.

Greece lacks a sufficient number of professionals in oncology-related specialties

The Greek health system and – most importantly – the public sector has substantial shortages of oncology-related specialist staff, such as pathologists, haematologists, surgical oncologists, radiation oncologists, oncology nurses and technical personnel to run the high-tech oncology equipment. Skills-mix teams needed for a person-centred approach, like oncology social workers, psychiatrists, psychologists and dietitians, are also lacking. Further, the number of non-clinical staff who affect the quality of care provided in a broad spectrum of services – like engineers and medical equipment maintenance and management personnel – is limited and rapidly declining.

In terms of training, medical oncology is under-represented in the curricula of Greek medical schools: it is considered a core course in only two of the seven medical schools (28.5 %), while in neighbouring Italy the proportion is 89.1 % (Ragias et al., 2020). Also, surgical oncology is not yet recognised as a standalone specialty, leading to a gap in training.

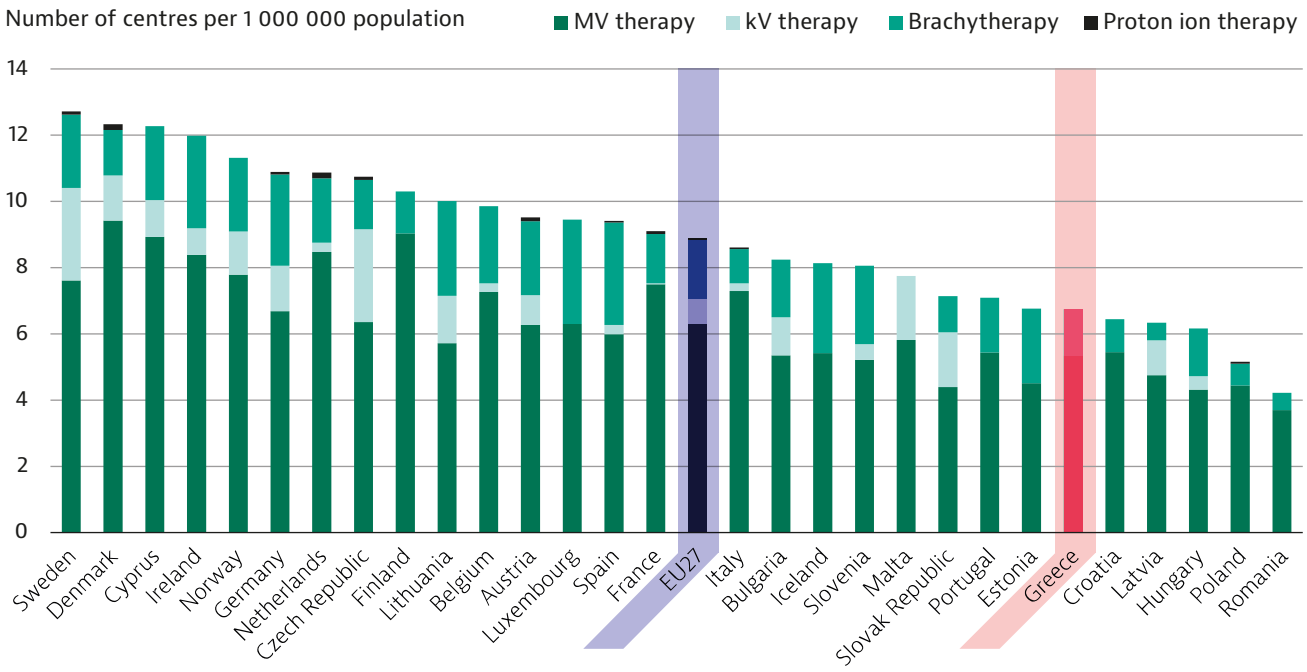
However, even though Greece has the highest number of physicians per capita among EU Member States, at 619.5 per 100 000 inhabitants in 2020, the rate of general practitioners remains the lowest in the EU, at 44 per 100 000 population. Such limited primary care capacity means that patients access hospital and specialised care directly, creating bottlenecks, increasing waiting times and eventually affecting quality of care.

Overall, there are significant inequities in the distribution of specialisations, mainly linked to an unregulated inflow from medical schools and supplier-induced demand, which result in inequalities in access to care. A national health workforce strategy, aligned with a national cancer strategy, is necessary to address longstanding issues, such as outflow of health professionals from Greece, retention, specialisation, lack of multidisciplinary care and shortages of health professionals.

Radiotherapy capacity is below the EU average, but diagnosis equipment numbers are high

In 2019, Greece had 71 radiation therapy devices in total – approximately 7 devices per 1 000 000 population, which is below the EU average (Figure 7). All equipment is kept in hospital settings, whereas some countries – such as Italy – also provide radiation therapy in ambulatory care. In addition, distribution of particle therapy centres is centralised in the two major cities, which leads to severe geographical inequities in access.

Figure 7. Radiotherapy capacity is below the EU average



Note: MV stands for megavolt and kV stands for kilovolt. The EU27 average is unweighted (calculated by the OECD).
Source: International Atomic Energy Agency.

Conversely, more computerised tomography (CT) and magnetic resonance imaging (MRI) scanners are available in ambulatory care units than in hospitals. In 2019, Greece had 171 CT scanners in hospital units and 285 in ambulatory care, corresponding to 4.3 per 100 000 population, which is far above the EU average of 2.4. In addition, there are 80 MRI units in hospital settings and three times more (262) in ambulatory care. However, this does not necessarily lead to greater patient access: most of the scanners are in urban and semi-urban settings, and those in ambulatory care are almost exclusively in the private sector.

Access to new cancer medicines is slower than in other EU countries

Timely access to new cancer treatment and precision oncology medicines is of the utmost importance for cancer patients, but in Greece they must often wait for a long time to receive newly registered and innovative medicines. In 2017, time to market entry for an oncology medication in Greece exceeded the EU average, and this has worsened over time (Filosofou et al., 2017). It was estimated that the median time from marketing authorisation to listing for new oncology medicines in 2021 was approximately 28 months (Kourlaba & Beletsi, 2021), when the average time between marketing authorisation and first access among 28 EU countries was almost half that (398 days). Patients in Germany (17 days), the United Kingdom (22 days) and Austria (31 days) had the most rapid access in medicines. Patients also face the problem of precision oncology medicines that require biomarker testing; this is either not available or not reimbursed in Greece. Thus, patients are prescribed

very expensive and complex new precision treatments without knowing whether they will be beneficial for them, and the country is losing money on treatments that may not be indicated for the patients who receive them.

Remote communities face issues in accessing cancer care

Geographically uneven development of health care infrastructure and services have created disparities between urban and rural or remote areas (especially islands) in the country – particularly in specialised care like oncology, since most Greek oncologists are based in urban areas. Sparse oncology services in rural areas affect accessibility and timeliness, and internal migration for mid- and long-term cancer care is frequent. Travelling from the islands to Athens or from rural areas to a city to receive care requires time; this leads to loss of income, non-clinical costs (transfer and accommodation) and severe impacts on personal and social life. In addition, such expenses may be borne by more than one person when the patient is accompanied by a carer, leading to additional socioeconomic implications for the carer, including loss of income and mental fatigue. This situation creates large inequalities for cancer patients based on their ability to pay to seek care (Athanasakis et al., 2012; Ziomas, Konstantinidou & Capella, 2018). Small regional hospitals may have an oncologist but may lack other important specialties for cancer care –such as haematologists and lab specialists for biomarker testing – while some have an oncology department but no doctors.

Access to palliative and end-of-life care is very limited, creating a burden for households

Greece has not developed an organised framework for palliative care services – especially those provided at home. This situation is not discussed broadly, especially among policy makers, although attempts to create a framework have been made in the past. The country's scarce palliative and end-of-life services are provided mainly on a voluntary basis within public hospitals, by nurses paid by the family per hour, by untrained carers at home (usually immigrant women) or by private providers, NGOs and philanthropic entities. As a result, households and families face important financial burdens – both directly when covering the cost of care and indirectly when family members experience loss of income to care for relatives. The National Action Plan for Public Health 2021-2025 recognised the need to develop a national strategy on palliative care, and outlined the need for palliative care to be integrated into the health care services, without however providing specific actions. A law on palliative care was submitted in December 2022.

5.2 Quality

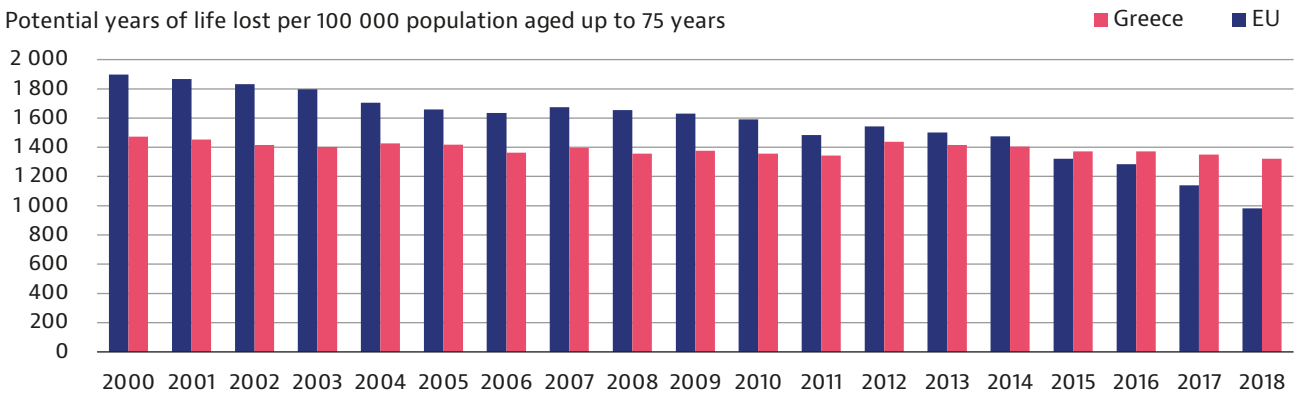
Quality of cancer care in Greece has not improved in recent years

Cancer care in Greece has remained underdeveloped, which has a severe impact on mortality, morbidity, disease burden and quality of life for patients with a history of cancer. There are many key levers to implement, including in public health interventions, involvement of multidisciplinary teams, strengthening the role of primary care in prevention, early detection and rehabilitation, and creating patient pathways across the course of the disease. Some efforts have been made to develop and introduce clinical guidelines and therapeutic protocols in cancer management, but these are still not widely used in an organised and comprehensive manner. For example, clinical guidelines on lung cancer have been provided or adopted by scientific societies, but they are not implemented widely at the national level, they also rarely include early detection and referral algorithms that can be used in primary care.

Overall, the potential years of life lost from cancer in Greece dropped marginally from 1 474 years per 100 000 population in 2000 to 1 322 years in 2018 – a 10 % reduction. In comparison, the rate halved across the EU: from 1 898 years in 2000 to 982 years in 2018 (Figure 8). This is indicative of the fact that Greece is struggling to improve the overall quality of its cancer care system. Quality assurance schemes for delivery of cancer services in public hospitals are not in place. The recently established Organisation for Quality Assurance spent its first two years of operation reviewing COVID-19 clinics and hospitals, but it is expected that it will work to establish quality assurance schemes for oncology services.

Based on information from the Organisation of European Cancer Institutes, Greece is among the nine EU Member States that do not yet have a recognised or accredited comprehensive cancer infrastructure, and only one hospital in the country is a member of the network.

Figure 8. Years of life lost due to cancer have remained stable in Greece over the past two decades



Note: The EU average is unweighted (calculated by the OECD).
Source: OECD Health Statistics 2022.

Comprehensive quality assurance and monitoring mechanisms are lacking in Greece

Greece does not have a comprehensive surveillance and monitoring mechanism for cancer incidence, prevalence and survival rates that could provide data on cancer care and inform relevant policies. Evidence and data, when not scarce, are fragmented and generally retrieved from a variety of sources, mainly related to the hospitalisation aspect of care. There are no patient-reported measures assessing the quality of cancer care in Greece, like patient-reported outcomes and experience measures. Some quality-of-life surveys are performed independently by research groups but are rarely used by policy makers. Clinical indicators related to patient outcomes and follow-ups, such as re-admission rates, are also not collected in a systematic manner. This lack of indicators means that physicians are not informed about the evidence-based expertise of oncology hospitals/clinics in specific cancer types or procedures so that they can refer their patients in confidence to expert cancer services.

Overall, national quality indicators (such as waiting time from diagnosis to treatment and stage of cancer when diagnosed) and local quality indicators (such as workforce ratios, accreditation and post-surgical complication rates) are not readily available. Consequently, there are no mechanisms to supervise and evaluate medical practices, which raises concerns for patient safety. Greece has no central national authority to which medical errors can be reported, are not acknowledged and remedied, and most adverse events are detected using ad hoc reporting, which identifies only a small number. Multiple surveys have shown high levels of patient dissatisfaction with the quality of health care in Greece, especially during the financial crisis (Economou et al., 2017) and similarly during the COVID-19 pandemic.

Cancer care is almost entirely managed in the inpatient sector in Greece

The Greek health care system is very hospital centric, including for cancer care. Of approximately 270 hospitals, 124 are public. Aside from oncology departments in general hospitals across the country, there are four cancer specialised hospitals – three in the Attiki region (Athens) and one in the Central Macedonia region (Thessaloniki). Departments dedicated to childhood cancer are either in paediatric hospitals or in general and tertiary hospitals. Cancer therapy takes place almost exclusively in hospital settings. Furthermore, more than 30 private hospitals and ambulatory clinics provide cancer care services and treatment. Primary health care in Greece is not yet developed in a comprehensive and organised manner, even though efforts have been made by every government for the last three decades. The current role of the primary care sector in management of cancer is very limited. This is linked to the training of general practitioners and nurses, which does not include components of cancer care.

Greece remains one of the few EU countries without a cancer registry

While most EU countries have been developing and improving cancer registries for decades, Greece remains one of the few countries that do not collect accurate and complete cancer data to perform epidemiological research and cancer care planning. The lack of a cancer registry means that policy makers are not able to understand the causes of cancer or to assess the effectiveness of screening programmes or cancer treatment. It also impedes research activities to monitor cancer trends, analyse inequalities, estimate survival rates and assess cancer care quality.

The introduction of a cancer registry has been a recurrent demand from patients, oncology and haematology medical associations and civil society more broadly. It was also among the key priorities of both National Cancer Plans (2008-2012 and 2011-2015), but no implementation has yet occurred. The former National Centre for Disease Control and Prevention was assigned the role of developing a national cancer registry in 2005, with support from EU Structural Funds, but the results were suboptimal, and efforts were discontinued in 2012. More recently, a key objective of the embryonic national cancer institute – established by law in 2019 but yet to start operations – was development of a comprehensive national cancer registry.

The School of Medicine of the University of Crete, in collaboration with the Regional Administrative Authority of Crete, operates the Cancer Registry of Crete (CRC), collecting and monitoring regional mortality and morbidity cancer data and risk factors from the population of Crete. Other objectives include development of methodological standards, a research framework on data privacy, data-mining techniques and application of an integrated digital monitoring system. The CRC is member of the IARC, the European Network of Cancer Registries and the Joint Research Centre.

The Greek government recently announced development of a national cancer registry and a national cancer registry for children and adolescents. These are part of the overarching Integrated Oncology-Haematology Patient Care System funded by the EU Recovery and Resilience Facility. Their aim is to support cancer patients throughout the course of the disease, from diagnosis to treatment and through rehabilitation. This mechanism will support evidence-based treatment decisions through integration of personal medical records; configuration of treatment schemes according to applicable therapeutic protocols and progress monitoring; patient pathways; and remote monitoring of patients through mobile apps.

Precision oncology medicine is being developed in Greece

The Hellenic Precision Medicine Network in Oncology was founded in 2018 as a flagship initiative of the government, with the aim of developing diagnostic tools to tailor medical care for cancer patients based on their unique characteristics and needs, and to promote research and real-world evidence studies. These diagnostic services enable detection of genetic predispositions to cancer in diagnosed patients and in healthy individuals with a family history of cancer, and timely implementation of appropriate treatment and secondary or primary prevention.

During its pilot phase (2018-2021), the Network included national research and academic institutions with a significant body of work in molecular biology, medicine and data science. The services were provided by four medical precision oncology units: two in Athens, one in Thessaloniki and one in Heraklion. These provided genetic and molecular analysis services using next-generation sequencing; linked to the e-Governance Centre for Social Security Services; and provided physicians and diagnosticians with validated workflows for analysis and interpretation of the findings. Services were provided to cancer patients following referral by their medical team.

Between March 2019 and the end of October 2021, approximately 5 500 next generation sequencing tests using gene panels (multimarker testing) were performed. Furthermore, the Network assisted in standardisation of procedures, completed regular inter-laboratory checks, reviewed seven reference laboratories, promoted the use of digital health tools and supported the national repository for cancer genomic data. It was intended for the Network to become a legal entity, supported by funding from the Recovery and Resilience Fund. However, this did not happen due to a change in government policies on the matter, leading to cessation of the operations of the Network in December 2021. A different follow-up scheme (not a legal entity) has been announced, based on a collaboration of research and academic centres. Thus far, no concrete plans, start date of operations or their scope are known.

Currently, physicians have no choice other than referring their patients to private laboratories performing genomic cancer profiling, which puts an extra financial burden on cancer patients as these tests are mostly not reimbursed by the public health care system. Issues regarding quality assurance and storage of the findings are also unresolved.

5.3 Costs and value for money

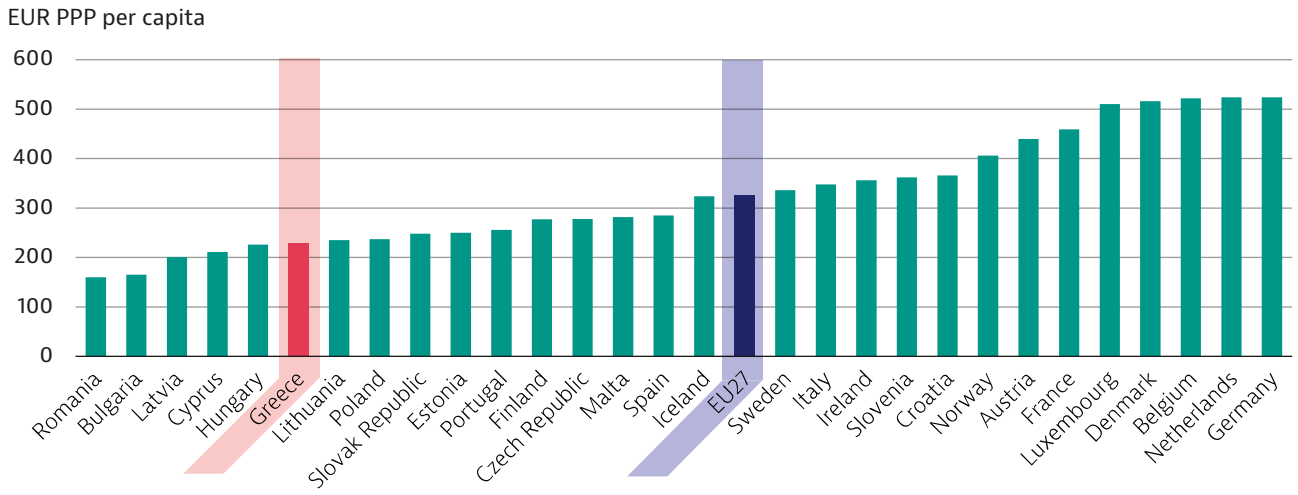
Expenditure on cancer care in Greece is among the lowest in the EU

To estimate the financial burden of cancer on households and patients, both direct and indirect costs must be considered. In 2018, the estimated total cost of cancer in Greece was slightly more than EUR 2 billion. About 48 % of this corresponded to direct costs. Approximately

15 % was opportunity costs of forgone time caused by provision of unpaid care by relatives. The remaining 37 % resulted from productivity losses attributed to morbidity and premature mortality.

Overall, the economic cost of cancer was EUR 229 per capita in Greece after adjusting for purchasing power parity (PPP), which is lower than the EUR 326 EU average (Figure 9).

Figure 9. Per capita expenditure on cancer care in Greece is among the lowest in the EU



Note: The EU27 average is unweighted (calculated by the OECD).
Source: Hofmarcher et al. (2020).

The direct and indirect costs of palliative and end-of-life care are a severe burden for households

A study of patients with terminal-stage lung cancer who died between September 2011 and June 2014 (Souliotis et al., 2019) indicated that the direct medical costs during the last six months of their lives were substantial. Most notably, approximately 74 % of the total inpatient cost of care was related to chemotherapy, which suggests a significant lack of financial protection as an aspect of universal health coverage. Other inpatient costs included hospitalisation (17 %), hospital fees (8 %) and transfusions (1 %). The highest outpatient costs were associated were concomitant medication (59 %), followed by the costs of tests (21 %) and radiotherapy (20 %). Moreover, the cost of both inpatient and outpatient services during this period of care had an increasing trend and peaked during the fifth month, suggesting a less aggressive treatment regime during the last month of life.

5.4 COVID-19 and cancer: building resilience

COVID-19 led to important disruption to provision of oncology care in Greece

The Hellenic Cancer Federation, a national umbrella organisation for cancer patient associations, performed a two-phase survey among cancer patients during the pandemic, with the aim of identifying the direct and indirect impact of COVID-19. Two waves of the survey were carried out: the first during summer 2020 and the second during spring 2021. One in three participants in the first wave reported that it was difficult (28 %) or they were unable (3 %) to access health care services. Difficulties were mostly related to distance – specifically having to travel more than half an hour to the closest service. These were reported by around 36 % of patients and 24 % of patients with a history of cancer. According to the study, the pandemic had a greater impact on surgical operations than other therapies, as a significant proportion had to be rescheduled or cancelled. Further, 45 % of participants reported rescheduling or cancellation of an appointment due to overburden of the health system.

The second round of the survey revealed that half of patients surveyed were diagnosed after the COVID-19 outbreak. More than one in five stated that their therapy was affected by the pandemic, including delays in surgery or therapy and changes in treatment. Reportedly, access to care for cancer patients deteriorated significantly because the sole focus of health care services was on dealing with COVID-19 and capacity to meet other health needs was reduced. Approximately 40 % of participants experienced an increase in out-of-pocket expenses related to their health during the pandemic; this is linked in part to barriers to accessing public

services. Further, compared to the first wave, a lower proportion of participants reported that they received timely guidelines and information on preventing or dealing with COVID-19 when having cancer.

A study among surgical oncology practices in Greece and Cyprus aimed to evaluate surgeons' perceptions of the impact of COVID-19 in both countries during the first (March-June 2020) and second (November 2020-January 2021) waves of the pandemic. According to the results, there was a significant decrease between the two waves among patients willing to undergo surgery and to present at consultations. Nonetheless, availability of surgical services remained limited. The research highlights surgeons' concern about the potential impact on cancer patient survival in both waves. A mismatch in patients' needs and the availability of health care services was identified that should be taken into consideration by policy makers (Magouliotis et al., 2021).

6. Spotlight on inequalities

Greece lacks an overarching national cancer control plan, covering the whole continuum of cancer care from prevention, screening, treatment and care to rehabilitation, palliative and end-of-life care. Previous efforts to develop a national cancer plan failed because they were not backed up by implementation, human and financial resources and monitoring systems. Furthermore, while other EU Member States have been developing and improving cancer registries for decades, Greece has been unable to do so, hindering research, surveillance, prevention, early detection, treatment and cancer control planning.

Unregulated and uneven distribution of health workforce creates shortage and bottlenecks in high-demand services, including cancer diagnosis, treatment and care. This has an impact on care quality, and pushes people to the private sector, thus increasing social health inequities. The Greek health care system is historically hospital centric and disease focused, which makes it more reactive than preventive. Primary health care remains underdeveloped, affecting screening rates, early diagnosis and prevention, leading also to several inequalities.

- Although prevalence of smoking has declined in the last two decades, in 2019 almost one in four adults smoked daily – the second highest rate in the EU. The financial crisis and related austerity measures partly explain increasing risk factors for cancer, especially among the most vulnerable people.
- Important disparities are identified in cancer screening uptake across social groups. The proportion of women on higher incomes reporting breast examination was almost double (86 %) the proportion on lower incomes (46 %). The proportion of women with higher education levels who reported ever having taken a smear test (85 %) was more than double that of those with lower education levels (39 %).
- Greece displays substantial inequalities in terms of service distribution between urban and rural areas, between public and private sector and among health professionals and medical specialties. Remote, island and rural areas populations face significant barriers in access to cancer care both geographically and financially, which might lead to catastrophic health expenditure.

Socioeconomic determinants of health are important drivers of the cancer burden in Greece. The financial crisis and related austerity measures had an impact on public health, both by increasing socioeconomic and environmental risk factors and by weakening a health system that already experienced important structural challenges. Efforts to establish public organisations and institutions to support cancer care and cancer research have been unsuccessful, and delivery of cancer care remains largely fragmented.

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Country abbreviations

Austria	AT	Denmark	DK	Hungary	HU	Luxembourg	LU	Romania	RO
Belgium	BE	Estonia	EE	Iceland	IS	Malta	MT	Slovak Republic	SK
Bulgaria	BG	Finland	FI	Ireland	IE	Netherlands	NL	Slovenia	SI
Croatia	HR	France	FR	Italy	IT	Norway	NO	Spain	ES
Cyprus	CY	Germany	DE	Latvia	LV	Poland	PL	Sweden	SE
Czech Republic	CZ	Greece	EL	Lithuania	LT	Portugal	PT		

European Cancer Inequalities Registry

Country Cancer Profile 2023

The European Cancer Inequalities Registry is a flagship initiative of the Europe's Beating Cancer Plan. It provides sound and reliable data on cancer prevention and care to identify trends, disparities and inequalities between Member States and regions. The Registry contains a website and data tool developed by the Joint Research Centre of the European Commission (https://cancer-inequalities.jrc.ec.europa.eu/), as well as an alternating series of biennial Country Cancer Profiles and an overarching Report on Cancer Inequalities in Europe.

The Country Cancer Profiles identify strengths, challenges and specific areas of action for each of the 27 EU Member States, Iceland and Norway, to guide investment and interventions at the EU, national and regional levels under the Europe's Beating Cancer Plan. The European Cancer Inequalities Registry also supports Flagship 1 of the Zero Pollution Action Plan.

The Profiles are the work of the OECD in co-operation with the European Commission. The team is grateful for the valuable comments and suggestions provided by national experts, the OECD Health Committee and the EU Expert Thematic Group on Cancer Inequality Registry.

Each Country Cancer Profile provides a short synthesis of:

- the national cancer burden
- risk factors for cancer, focusing on behavioural and environment risk factors
- early detection programmes
- cancer care performance, focusing on accessibility, care quality, costs and the impact of COVID-19 on cancer care.

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