Mapping the Efficiency of Cancer Care in Greece:

Pilot Implementation of the Action Guide for Efficient Cancer Care

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EXECUTIVE SUMMARY

Overview

This report presents the findings of a comprehensive assessment of cancer care efficiency in Greece, conducted through the pilot implementation of the All.Can Action Guide. With approximately 63,000 new cancer cases diagnosed annually and over 32,000 cancer-related deaths in 2022, cancer represents a critical and growing public health challenge in Greece. The country's age-standardized cancer mortality rate exceeds the EU average by 13% for men, while cases are projected to increase by 23% by 2040. Against this backdrop, inefficiency in cancer care—estimated globally to account for 20-40% of health expenditure—demands urgent attention. This assessment examined three critical dimensions of cancer care efficiency: timeliness of care, coordination of care, and patient-centredness, employing both qualitative and quantitative analytical methods to identify systemic strengths, weaknesses, and opportunities for improvement.

Key findings

1. Timeliness of Care

The analysis reveals significant challenges in delivering timely cancer care across the patient journey in Greece. While the country possesses modern diagnostic infrastructure and specialized cancer treatment facilities, substantial delays persist at critical junctures, from initial presentation to diagnosis, and from diagnosis to treatment initiation. These delays stem from multiple systemic factors including fragmented referral pathways, insufficient capacity in diagnostic services, and the absence of standardized care protocols.

A particularly concerning finding is the lack of comprehensive time-to-treatment monitoring mechanisms. Without systematic tracking of waiting times and diagnostic intervals, the healthcare system operates without the performance data necessary to identify bottlenecks or measure improvement initiatives. The shortage of specialized healthcare professionals, particularly in oncology nursing and pathology, further constrains the system's capacity to deliver timely interventions. Geographic disparities compound these challenges, with patients in rural and remote areas experiencing longer delays in accessing specialized diagnostic and treatment services.

Despite these challenges, Greece demonstrates notable strengths in certain areas of timely care delivery. The country has invested in modern radiotherapy equipment and advanced diagnostic

technologies, providing the technical foundation for prompt treatment when patients reach specialized centers. However, the translation of this technical capacity into consistently timely patient outcomes remains hindered by systemic coordination failures and workforce limitations.

2. Coordination of Care

Coordination of cancer care in Greece is characterized by fragmentation across multiple dimensions: between primary and secondary care, across different hospital departments, and throughout the continuum from diagnosis through treatment to survivorship. The analysis identified weak referral mechanisms as a fundamental barrier to seamless care transitions. Primary care physicians often lack clear protocols for referring suspected cancer cases to appropriate specialists, while communication channels between care levels remain underdeveloped.

A significant finding concerns the complete absence of patient navigation services, a critical gap given the complexity of modern cancer care pathways. Patients and families must independently navigate a complex healthcare system without structured support, leading to delays, confusion, and potentially suboptimal care decisions. This absence is particularly problematic for vulnerable populations who may lack health literacy,or the financial and social resources to effectively advocate for themselves within the system.

Multidisciplinary tumor boards represent a notable strength in care coordination. These boards are widely available across Greek cancer centers and benefit from legislative support mandating their use in cancer care decision-making. They provide a structured mechanism for coordinating expertise across surgical, medical, and radiation oncology, along with pathology, radiology, and other specialties. However, the analysis reveals that monitoring and quality assurance mechanisms for these boards remain underdeveloped, limiting the ability to ensure consistent standards and continuous improvement.

The development of Comprehensive Cancer Centers (CCCs) shows strong political momentum and represents a promising initiative for improving care coordination. However, these centers currently lack the regulatory frameworks, standardized operational models, and population coverage needed to function as effective national hubs of excellence. Strengthening and expanding the CCC network could provide the structural foundation for more coordinated, evidence-based cancer care delivery.

3. Patient-Centeredness

Greece demonstrates both significant progress and persistent gaps in patient-centered cancer care. A notable achievement is the country's advancement in implementing Patient-Reported

Outcome Measures (PROMs) and Patient-Reported Experience Measures (PREMs) within digital health systems. The coordination of PROMs and PREMs collection at the national level represents forward-thinking policy that positions Greece favorably compared to many European peers. This infrastructure creates the potential for systematic incorporation of patient perspectives into quality improvement and clinical decision-making.

However, substantial limitations constrain the realization of truly patient-centered care. Patient access to their own clinical data remains restricted, limiting their ability to actively participate in care decisions or seek informed second opinions. Structured patient education programs are inconsistently available, leaving many patients without the information necessary to understand their diagnosis, treatment options, and self-management strategies. Shared decision-making, while increasingly recognized as essential to quality cancer care, is not systematically implemented across the healthcare system.

The absence of comprehensive survivorship care planning represents another significant gap. As cancer survival rates improve, the population of cancer survivors requiring long-term follow-up and management of late effects continues to grow. Without structured survivorship programs, these patients often fall through the cracks between active treatment and routine primary care, potentially missing important surveillance and experiencing unaddressed quality-of-life concerns.

Policy recommendations for decision making

Based on the comprehensive assessment, the strategic policy recommendations and the foundational priorities proposed are: *to establish a comprehensive, evidence-based national strategy* with clear objectives, timelines, and accountability mechanisms for improving cancer prevention, early detection, treatment, and survivorship care; to clarify lines of authority, *establish national cancer coordination mechanisms*, and create formal linkages between primary care, specialized cancer centers, and Comprehensive Cancer Centers; to *develop and mandate nationally agreed clinical pathways* for major cancer types, incorporating evidence-based time-to-treatment targets and quality indicators; to establish systematic tracking of timeliness metrics, quality indicators, and patient outcomes, with regular public reporting to drive accountability and continuous improvement; to *develop strategic workforce plans with targeted investments in oncology nursing, pathology, and other shortage specialties*, including enhanced training capacity and retention strategies; to *Implement structured patient navigation programs* to support patients and families in navigating complex cancer care pathways, with particular attention to vulnerable populations; to *accelerate Comprehensive Cancer Center Development*, ensuring adequate geographic coverage and clear population-based responsibilities; and finally to

enhance Patient Access and Engagement, systematically incorporating shared decision-making, and utilize PROMs/PREMs data to inform care improvement.

Conclusion

Greece stands at a critical inflection point in cancer care delivery. The country possesses many fundamental building blocks—modern infrastructure, digital capabilities, clinical expertise, and stakeholder commitment—required for a high-performing cancer care system. However, persistent fragmentation, absent coordination mechanisms, and inadequate performance monitoring prevent these assets from translating into consistently excellent outcomes for all patients. Strategic consolidation through national planning, strengthened governance, standardized pathways, workforce investment, and patient-centered reforms can transform Greece's cancer care system into a model of efficiency and effectiveness. The time for coordinated sustained action is now.

INTRODUCTION

The global burden of cancer is rapidly rising, with approximately 20 million new cases and 9.7 million deaths in 2022, making it a leading cause of mortality worldwide (WHO, 2025). Cancer is one of the most significant public health challenges in Europe, with substantial regional disparities in incidence, mortality, and access to healthcare. According to The Swedish Institute for Health Economics – IHE (2025), cancer represents the second most common cause of mortality in Europe as 1.3 million people lost their lives to it in 2024 and another 2.7 million people were diagnosed with the disease (E.C., 2026).

Cancer is expected to become the primary cause of mortality in the European Union by 2035. At present, it accounts for nearly one in every four deaths. It is also associated with the highest disability-adjusted life years (DALYs) alongside cardiovascular diseases. This upward trend is largely attributable to demographic changes, particularly population ageing. Given that cancer is strongly associated with advancing age, incidence rates are anticipated to continue increasing in the years and decades ahead.

In Greece, cancer similarly represents a major and progressively growing public health concern. In 2022, over 63,000 new cancer cases were estimated to have been diagnosed in Greece, corresponding to an age-standardized incidence rate of 529 per 100,000 population, and over 32,000 people died from cancer. The estimated number of new cancer cases per 100,000 inhabitants in Greece in 2022 was slightly below the EU average, a number which is expected to increase by 23% by 2040. Compared to the 2022 EU average, cancer mortality per 100,000 inhabitants in Greece was 13% higher for men and 2% lower for women (E.C., 2023).

BACKGROUND & RATIONALE (or HOW DID WE GET HERE)

Inefficient cancer care is a leading factor in poorer outcomes for patients. According to the OECD, one-fifth (20%) of healthcare expenditure either does not improve people's health or could worsen their outcomes (OECD, 2017). In addition, the World Health Organization estimates that 40% of health spending is wasted through inefficiency (WHO, 2010).

Although it may be argued that greater efficiency is needed across all disease areas, in cancer this need is especially urgent due to the multifaceted effects and the burden of the disease. Advances in the way we diagnose and treat many forms of cancer promise to transform outcomes for many patients in years to come. However, a number of expert commissions and professional groups have suggested that we must find ways to allocate resources more efficiently in cancer care and reorganize our priorities in terms of long-term investments rather than short-term policy fixes. However, building efficiency in cancer care is challenging and requires health systems to operate as highly effective, evidence-based and data-driven learning systems. This requires a common set of evidence-based metrics from which systems can choose and use, according to their own specific needs and circumstances.

To follow the principles of person-centered care (All.Can, 2021), as well as improving cancer care efficiency, policymakers and practitioners first need to better define what health outcomes they are trying to achieve. Furthermore, they must ensure that these ambitions align with what matters most to patients and their families. The use of more transparent, high-quality and holistic data is imperative if a system-wide approach to continuously assessing and improving efficiency in cancer care is to be supported. According to All.Can, doing so will allow for a) the identification of practices that fall below national standards or lead to inequalities in cancer care, b) better coordination of multidisciplinary teams and resources and c) benchmarking to drive continuous improvement and accountability in meeting patients' needs. All.Can's definition of efficiency - "*care that delivers the best possible health outcomes using the human, financial, infrastructural and technological resources available, with a focus on what really matters to patients and society*." - highlights the need to focus on resources, processes, and the human factors that matter most to patients and families as they traverse their cancer care journey.

Achieving greater efficiency calls for a whole-system view of cancer care, focused on delivering optimal outcomes for patients across the entire care pathway. It also requires less emphasis on the upfront cost of a given intervention or policy (i.e. year by year), and greater value placed on the long-term impact of care choices, investments and on outcomes and costs – including social costs (E.C., 2016).

All.Can International, supported by the All.Can Research and Evidence Working Group assessed current evidence and grey literature with the aim of identifying a core set of internationally applicable metrics evidenced as being suitable for measuring cancer care efficiency (All.Can, 2022). These metrics could then be used by stakeholders to define a baseline from which to monitor the efficiency of cancer care, according to their own circumstances and in a way that best meet their own specific needs. Furthermore, the measures presented could be used more broadly to better understand where healthcare systems might direct more focus when seeking to evaluate whether healthcare is being delivered efficiently.

In 2025, All.Can advanced the implementation and dissemination of the *Action Guide for Efficient Cancer Care* as a single, integrated effort linking national pilots with targeted policy and digital outreach to drive adoption (All.Can, 2024). Implementation progressed in three countries, (Australia, Mexico and Greece) demonstrating the Guide's adaptability across different levels of system readiness.

Despite strong advocacy from numerous stakeholders for a national cancer-specific plan, Greece lacks so far, a comprehensive, evidence-based strategy that addresses the full spectrum of cancer care and policy. This includes areas such as prevention, early detection, diagnosis, treatment, rehabilitation, palliative care, quality of care, patient experience, equity in access, social protection, workforce planning, survivor support, and clinical research (IHE, 2024). Greece fares relatively poorly compared to other EU countries with regards to daily smoking, overweight and obesity, fruit consumption and air pollution. Greece has gradually implemented screening programmes, including a population-based breast cancer screening programme for women aged 45-74, cervical and colorectal cancer, cardiovascular disease and severe obesity. However, there are concerns regarding their funding and duration, as they are currently financed by the Recovery and Resilience Fund until the end of 2026, with no clear plan for the subsequent steps. Moreover, most existing policy efforts remain fragmented, and their effectiveness has not been systematically assessed, while chronic significant socioeconomic disparities in screening access seem to persist. This is partly due to the absence of epidemiological data on cancer incidence and outcomes, such as patient registries. The national cancer registry was officially established by legislation in February 2024 and is currently under dissemination.

STUDY DESIGN AND ANALYTICAL FRAMEWORK

The *Action Guide* has three core aims:

1. *To offer guidance, resources and recommendations for implementing cancer efficiency metrics* within the contexts of diverse users
2. *To provide a non-linear tool, whereby users can navigate according to their specific needs* – for instance by accessing individual sections independently and by following the links within and across entry points or to external resources that support further readings
3. *To serve as a living tool*: Collaboration is a core value underpinning the development of this Action Guide. To ensure that the content of the guide will remain relevant over time, we encourage continuous feedback and contributions from users, as new insights emerge and evidence evolves.

The Greek pilot implementation aims to adapt and apply the *All.Can Action Guide* to the country context and within its National Health System, marked by certain inefficiencies, fragmentation and inequality problems.

The scope of the study can be defined as:

- *Assessing health system preparedness*, involving stakeholders, and identifying contextual factors
- *Move into the implementation phase* and validate key components of the Action Guide

and has been designed in three phases:

- Health system preparedness assessment,
- qualitative and quantitative analysis, and
- report launch with stakeholder engagement

The timetable for the pilot implementation in Greece, was executed as follows:

Graph 1. Timetable for the pilot implementation

In Phase 1, the following Tasks were completed:

1. **All.Can's Action Guide Questionnaire Translation and Adaptation**

All. Can International questionnaire was translated in Greek (two-way translation) and enriched with specific questions and dimensions pertaining to the Greek Health System peculiarities. We also created two additional columns, the first one indicating the references for answering YES in every specific criterion, and the second for reporting any remarks relating to the specific criterion.

Indicators were mapped to the three core dimensions of the All.Can framework:

- *Timeliness of care*, including delays in diagnosis and treatment initiation;
- *Coordination of care*, including referral pathways, continuity between levels of care, and information exchange; and
- *Patient-centeredness,* including patient experience, access to information, and engagement in care decisions.

2. **Desk Research**

This Task addressed mainly the questions on policy/legislative areas, and consisted of:

- Prefilled relative content in the questionnaire
- Proposed references for review by the participating stakeholders – responders

3. **Stakeholder Mapping & Analysis**

This Task performed:

- Extended Literature Review for Identification of the major cancer care stakeholders in Greece (duties, responsibilities, interests, power, actions) including a key performance & goal-setting methodology tool elaborated by the University of Piraeus
- Selection of the participating Hospitals (shortlist-proposal-acceptance-final decision for inclusion)
- Listing of the proposed additional stakeholders in Greece (shortlist-proposal-acceptance-final decision for inclusion)

Key Stakeholders in Cancer Care in Greece: Roles and Interactions

Cancer care in Greece involves a complex interplay of various stakeholders, each playing a unique role in the delivery, management, and improvement of cancer services. These stakeholders include healthcare Personnel. healthcare providers, patients, policymakers, family caregivers, academic institutions, private sector entities, non-governmental organizations (NGOs), and international organizations. Understanding their roles and interactions is crucial for developing effective cancer care policies and improving patient outcomes.

Healthcare Personnel

Healthcare Personnel are at the forefront of cancer care delivery in Greece. They include physicians, nurses, oncologists, and other medical specialists. These professionals are responsible for diagnosing, treating, and managing cancer patients. However, the Greek healthcare system faces challenges such as staff shortages, inadequate resources, and underdeveloped services like primary care, home care, and palliative care. Despite these challenges, healthcare personnel play a critical role in prioritizing areas for improvement, such as pain management, communication, and the organization of cancer services.

Patients

Patients are central stakeholders in cancer care. Their preferences, needs, and experiences shape the delivery of care. In Greece, patients often prefer a passive role in treatment decision-making, relying heavily on their doctors. However, there is a growing recognition of the importance of patient-centered care, with patients expressing a desire for more information about their illness and treatment options. Patient organizations and advocacy groups are also emerging as key stakeholders, advocating for improved cancer services and policies.

Policymakers and Government Agencies

Policymakers and government agencies are responsible for shaping the legal and regulatory framework for cancer care in Greece. The Greek National Health System (ESY) provides universal access to healthcare, but structural problems, such as the lack of a national cancer registry, hinder effective cancer control. The Ministry of Health plays a crucial role in implementing policies, such as the National Cancer Plan (NCP), which aims to improve cancer data collection, prevention, and treatment. However, the implementation of these policies is often hampered by financial constraints and bureaucratic challenges.

Family and Informal Caregivers

Family members and informal caregivers play a vital role in cancer care in Greece, particularly in socioeconomically deprived areas. They often take on the responsibility of providing emotional, practical, and financial support to cancer patients. However, caregivers face significant challenges, including limited access to resources and support services. The involvement of family members in decision-making processes is also influenced by cultural factors, with many families preferring to shield patients from bad news.

Academic and Research Institutions

Academic and research institutions contribute to the advancement of cancer care in Greece through research, education, and innovation. These institutions collaborate with healthcare personnel to develop new treatments and improve existing ones. Research institutions also play a key role in

identifying priorities for cancer care improvement and in evaluating the effectiveness of existing services.

Private Sector

The private sector, including pharmaceutical companies and private healthcare providers, is an important stakeholder in cancer care. Private hospitals and clinics often provide specialized cancer treatments and technologies that may not be available in the public sector. However, the high cost of cancer treatments and the financial burden on patients highlight the need for better collaboration between public and private sectors to ensure equitable access to care.

Non-Governmental Organizations (NGOs) and Patient Advocacy Groups

NGOs and patient advocacy groups are increasingly involved in cancer care in Greece. These organizations work to raise awareness about cancer, support patients and their families, and advocate for policy changes to improve cancer services. Patient organizations also play a crucial role in representing the interests of cancer patients in policy dialogues and decision-making processes.

International Organizations

International organizations, such as the World Health Organization (WHO) and the European Alliance for Personalized Medicine (EAPM), provide guidance, funding, and technical assistance to improve cancer care in Greece. These organizations promote the adoption of best practices, support research and innovation, and advocate for patient-centered care. International collaborations also facilitate the sharing of knowledge and resources, which is essential for addressing the challenges of cancer care in Greece.

Interactions Among Stakeholders

The interactions among stakeholders in cancer care in Greece are complex and often influenced by the country's socioeconomic and political context. Healthcare providers and patients have differing priorities, with providers focusing on staff shortages and working conditions, while patients prioritize effective treatment and financial support. Policymakers and government agencies must balance the needs of various stakeholders while addressing systemic challenges, such as resource shortages and inefficient service delivery.

Family caregivers and informal support networks play a crucial role in filling the gaps in the healthcare system, but they often lack the resources and support they need. Academic and research institutions collaborate with healthcare providers to advance cancer care, but their efforts are sometimes hindered by limited funding and infrastructure. The private sector and NGOs contribute to cancer care through specialized services and advocacy, but their impact is limited by the fragmented nature of the healthcare system.

International organizations provide valuable support and guidance, but their efforts must be aligned with the specific needs and priorities of the Greek healthcare system. Effective collaboration among all stakeholders is essential for improving cancer care in Greece and ensuring that patients receive high-quality, patient-centered care.

Table 1: Key Stakeholders in Cancer Care in Greece

Stakeholder	Role	Interactions
Healthcare Personnel	Diagnose, treat, and manage cancer patients; prioritize areas for improvement	Collaborate with policymakers, patients, and academic institutions
Patients	Central to care delivery; express preferences for treatment and information	Engage with healthcare providers, policymakers, and advocacy groups
Policymakers and Government Agencies	Shape policies, implement NCP, address systemic challenges	Collaborate with healthcare providers, patients, and international organizations
Family and Informal Caregivers	Provide emotional, practical, and financial support	Interact with healthcare providers, patients, and NGOs
Academic and Research Institutions	Advance research, education, and innovation	Collaborate with healthcare providers and international organizations
Private Sector	Provide specialized treatments and technologies	Interact with public sector, patients, and NGOs
NGOs and Patient Advocacy Groups	Advocate for policy changes, support patients	Collaborate with policymakers, patients, and international organizations
International Organizations	Provide guidance, funding, and technical assistance	Collaborate with policymakers, healthcare providers, and NGOs

This comprehensive analysis highlights the interconnected roles and interactions of stakeholders in cancer care in Greece, emphasizing the need for collaboration and patient-centered approaches to improve outcomes.

4. Questionnaires & Interviews with eight major oncological hospitals/Clinics

After an extensive communication with candidate Public Oncological Hospitals/Clinics to participate in the pilot project and taking in consideration the All.Can Greece proposition, we concluded to include in the interviews the following hospitals:

Table 2: Participating Hospitals

1.	**General Anticancer Oncological Hospital "Agios Savvas", Athens**
2.	Metaxa Cancer Hospital, Piraeus
3.	Theagenio Cancer Hospital of Thessaloniki
4.	Alexandroupoli General Hospital
5.	General University Hospital of Larissa
6.	University General Hospital of Heraklion
7.	University General Hospital of Patras
8.	University General Hospital of Ioannina

The selected Hospitals represent a variety of Hospital types and are in various areas of Greece

Graph 2. Hospital Distribution by Location

5. Potential additional stakeholder groups

Apart from the 8 Oncological hospitals/Clinics and based on the stakeholder mapping (see Table 1) we decided to include in the interviews selected additional stakeholders, to incorporate their opinions and form a holistic view on the context.

Table 3: Additional Stakeholders

1.	ODIPY (Agency for Quality Assurance in Health)
2.	HESMO (Hellenic Society of Medical Oncology)
3.	EEAO (Hellenic Society for Radiation Oncology)
4.	ELLOK (Hellenic Cancer Federation)
5.	ESNE (Hellenic Nurses' Association - Sector of Oncology)
6.	EEPA (Hellenic Society of Pathology)
7.	Digital Health academic expert

6. Stakeholders' interviews/consultations

The interviews process was designed as follows:

- Organization of 2 Webinars with (participating) Hospital representatives
- Validate (some) of the data collected through desk research (follow the questionnaires)
- Collect the stakeholder's input on questions that cannot be answered by the desk research alone

Stakeholders offer further recommendations and clarifications, highlight gaps, and provide overall insights into various parts of the questionnaire

Insights from all stakeholders were synthesized thematically and used to contextualize and interpret quantitative results, rather than being treated only as standalone qualitative outcomes. This integrative approach mirrors the methodology behind the implementation of the All.Can Action Guide, where structured stakeholder dialogue was central to translating descriptive system assessments into actionable insights for policy and system reform.

STUDY FINDINGS:
QUALITATIVE & QUANTITATIVE ANALYSIS

QUALITATIVE ANALYSIS

The qualitative component of the Greek pilot provides essential context for the interpretation of the quantitative findings and understanding the reality, constraints and priorities of stakeholders across the cancer care ecosystem.

Across stakeholder groups, a recurring theme was the absence of a unified national cancer control strategy. Participants consistently highlighted that while Greece has developed numerous policy initiatives, such as digital health strategies, screening programmes, supportive and palliative care regulations, these efforts remain disconnected and insufficiently coordinated. The lack of a central governance body responsible for cancer strategy development, implementation and monitoring was described as a major barrier to system coherence.

Stakeholders emphasized that without a national plan, reforms depend heavily on local leadership, pilot initiatives or ad hoc funding, resulting in variable implementation across regions and hospitals. This fragmentation was seen as a root cause of delays, inefficiencies and inequities in cancer care.

Participants acknowledged significant progress in digital health infrastructure, including the national electronic health record (EHR), digital medication management systems, and the establishment of the national cancer registry. These developments were widely viewed as transformative facilitators for future system improvement.

However, stakeholders stressed that digital tools are not yet fully integrated into clinical workflows, and data linkage across public health, primary care, pathology and hospital systems remains limited. Many digital capabilities, such as real-time registry updates, interoperability pilots and medication harm monitoring, were described as “promising but not yet system-wide”. This gap between digital potential and operational reality was seen as a major constraint on timely care, performance monitoring and coordinated decision-making.

Workforce challenges emerged as one of the most pressing concerns across all interviews. Stakeholders described chronic shortages of oncology nurses, pathologists, radiologists, radiotherapists and specialized surgeons, particularly outside major urban centers. These shortages contribute to delays in diagnosis, treatment initiation and follow-up, and place significant strain on existing staff.

While participants acknowledged the existence of policies to address workforce shortages, they noted that implementation is inconsistent, monitoring mechanisms are weak, and staffing standards, especially for oncology nurses, are either absent or not enforced. The lack of structured task sharing and the complete absence of patient navigator roles further exacerbate coordination challenges.

Stakeholders uniformly recognized multidisciplinary tumor boards (MDTs) as a strength of the Greek cancer care system. MDTs are widely implemented, supported by legislation and embedded in clinical culture. However, participants noted that monitoring of MDT participation is limited, and operational models vary significantly across hospitals. Some MDTs function as formal, well-structured bodies with consistent documentation, while others operate more informally. Stakeholders emphasized the need for standardization, quality assurance mechanisms and systematic evaluation of MDT effectiveness.

Patient organizations reported increasing involvement in policy discussions and cancer plan development, reflecting a positive shift toward participatory governance. Clinicians also described growing efforts to engage patients in shared decision-making, particularly in MDT contexts.

However, stakeholders highlighted several persistent gaps:

- limited patient access to clinical data
- insufficient patient education and health literacy support
- inconsistent implementation of shared decision-making
- lack of patient-facing digital tools
- absence of navigation services for vulnerable groups

Participants stressed that while PROMs and PREMs are increasingly collected, their integration into clinical practice and policy decision-making remains limited.

A dominant theme across interviews was the lack of structured referral pathways and weak communication between primary care and oncology services. General practitioners often lack clear guidance on referral criteria, and feedback loops between primary and secondary care are inconsistent or absent.

Stakeholders described this fragmentation as a major factor of diagnostic delays, duplication of tests and patient confusion. The absence of patient navigators and limited coordination funding further exacerbate these challenges.

Participants highlighted significant disparities in access to specialized services, diagnostic technologies, radiotherapy capacity and supportive care across regions. Hospitals in Athens and

Thessaloniki reported greater access to advanced technologies and specialized staff, while regional hospitals reported significant resource constraints and limited access to multidisciplinary expertise. These inequities were seen as a major barrier to delivering timely and coordinated cancer care nationwide.

Despite structural challenges, stakeholders consistently emphasized the dedication and resilience of healthcare professionals. Clinicians, nurses and allied health staff often compensate for system gaps through informal coordination, personal initiative and extended workloads. However, participants noted that reliance on individual effort is not sustainable, and systemic reforms are needed to support coordinated, efficient and patient-centered care.

Overall, the qualitative findings reveal a system with significant strengths, including strong digital momentum, robust MDT culture, active patient organizations and committed professionals, but also deep structural weaknesses in governance, coordination, workforce capacity and patient empowerment. These insights provide essential context for interpreting the quantitative results and highlight the areas where targeted reforms could yield the greatest impact.

QUANTITATIVE ANALYSIS

CLUSTER 1: TIMELINESS OF CARE

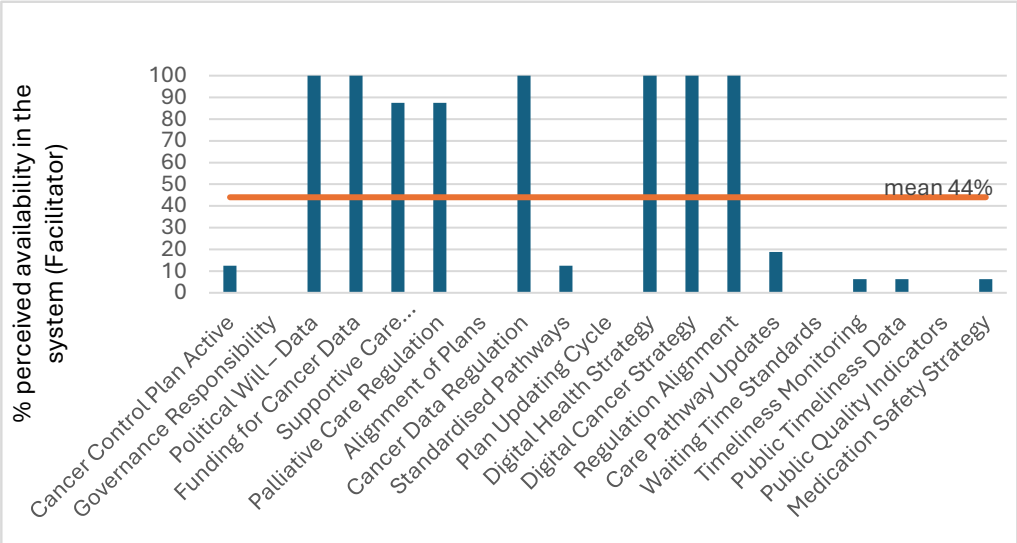
Timeliness of care is a foundational dimension of cancer system efficiency, as delays in diagnosis, treatment initiation and follow-up can significantly worsen outcomes and widen inequities. This cluster assesses the extent to which the Greek health system has established the strategic, regulatory, organizational and data-driven facilitators required to mitigate avoidable delays across the cancer pathway.

1.a Legal frameworks and strategy, policy context and funding

This sub-dimension assesses the degree to which legal prerequisites have been established, including coherent legal and strategic instruments that embed timeliness as system priority, such as cancer control plans, regulatory frameworks, aligned funding mechanisms, and governance structures responsible for implementation and monitoring. It also examines whether these instruments are operationalized through updated plans, standardized pathways, waiting-time standards and transparent performance reporting.

Figure 1 summarizes the perceived availability of system-level facilitators related to timeliness of cancer care. The average perceived availability across indicators was 44%, indicating moderate but uneven system readiness.

Figure 1. Cluster 1: Timeliness of care – (a) Legal frameworks and strategy, policy context and funding



In particular, stakeholders identified a set of high-availability enablers that form strong pillars of the Greek system. Several indicators reached 100% perceived availability, including:

- Political will to invest in health and cancer data
- Funding for cancer data infrastructure
- Legislation for cancer data registration and performance monitoring
- National digital health strategy
- Digital cancer strategy
- Alignment of cancer-related regulations across governance levels

These results reflect political and regulatory commitment to strengthen the national health data ecosystem.

In this context, supportive and palliative care regulation also scored highly (87.5% each), indicating that Greece is developing well-defined training and organizational frameworks in these domains, an important prerequisite for timely and holistic cancer care.

However, the results also reveal significant structural gaps in areas essential for translating policy into timely care delivery. Several indicators scored very low, including:

- Governance responsibility for cancer strategy development and monitoring (0%)
- Alignment of national and regional plans (0%)
- Regular updating of cancer control plans (0%)
- Waiting-time standards for diagnosis and treatment (0%)
- Public reporting of quality indicators (0%)
- Standardized patient pathways (12.5%)

- Timeliness monitoring (6.25%)
- Public timeliness data (6.25%)
- Medication safety strategy (6.25%)

These findings point to major systemic weaknesses. In particular, Greece lacks a national cancer control plan, resulting in fragmented initiatives and limited strategic coherence. Moreover, there is no clear governance oversight for cancer strategy implementation and monitoring, while standardized care pathways and waiting-time standards are absent, leading to variable patient journeys and delays. Finally, performance transparency is limited, with minimal public reporting of timeliness or quality indicators and monitoring mechanisms for preventable medication-related harms remain underdeveloped. These gaps significantly constrain the system's ability to operationalize its digital and regulatory strengths and to ensure timely, equitable access to cancer services.

The above results reveal a striking heterogeneity across indicators. The coexistence of very high scores for digital and regulatory elements, and very low scores for governance, planning and accountability creates a polarized readiness profile.

This divergence suggests that while Greece has invested in policy instruments, digital strategies and data infrastructure, these assets are not yet embedded within a coherent, operational framework that ensures timely cancer care delivery. The absence of a national cancer control plan, standardized pathways and monitoring mechanisms prevents the system from leveraging its strengths to reduce delays and improve outcomes.

The above findings indicate that Greece possesses many of the building blocks required for timely cancer care: political will, regulatory alignment, digital strategies and emerging data infrastructure. However, the lack of strategic direction, governance ownership, pathway standardization and performance transparency significantly limits the system's ability to deliver timely, coordinated and patient-centered care.

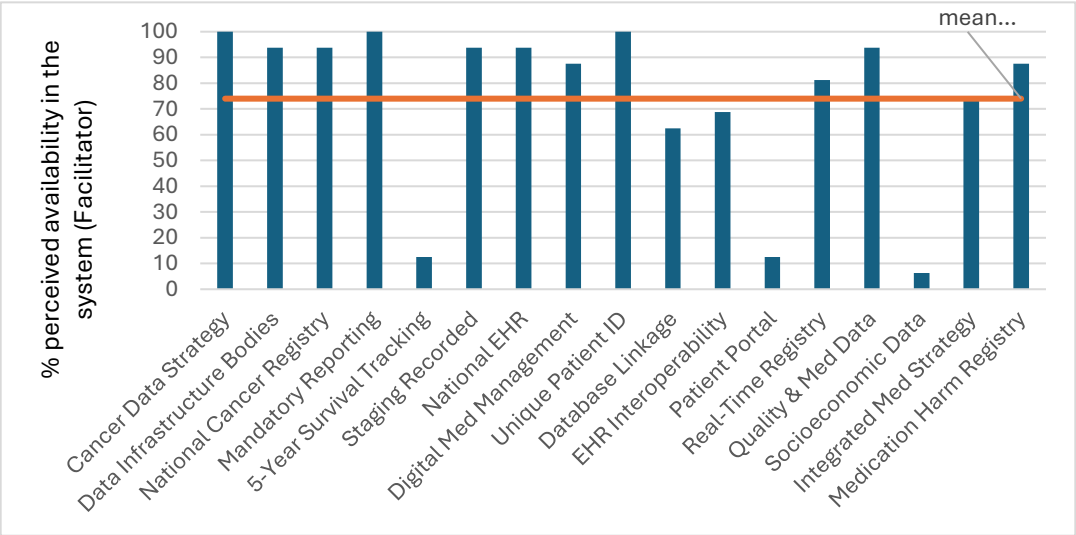
1.b Data Governance

Data governance is a fundamental element for timely and coordinated cancer care, as it determines the extent to which health systems can generate, integrate and utilize information across the entire care pathway. This section assesses the availability of core data infrastructures, cancer registries, interoperability mechanisms and patient-level identifiers that support monitoring, continuity of care and system-wide performance improvement.

Figure 2 summarizes the stakeholder perceptions regarding the availability of data governance structures that support timely cancer care in Greece. Across all indicators, the average perceived

availability was 74%, indicating a higher level of system readiness compared to the legal and policy framework domain presented in the previous section.

Figure 2. Cluster 1: Timeliness of care – (b) Data governance



Stakeholders reported very high availability across several core components of the national cancer data ecosystem. Cancer data strategy, mandatory reporting and the existence of a unique patient ID (all scoring 100%) demonstrate an established essential policy and technical prerequisites for systematic cancer data collection and linkage. Accordingly, the high perceived availability of the National cancer registry, staging recorded, national EHR, quality and medication data and data infrastructure (all reaching 93.75%) indicate that the foundation required for comprehensive cancer information management is largely in place.

In contrast, indicators related to interoperability and data linkage showed moderate performance. The availability score of database linkage (62.5%) and EHR interoperability (68.75%) suggest that, while technical capabilities exist, they are not yet fully scaled or consistently implemented across the system. The higher score of real-time registry updates (81.25%) indicates progress, but further development is needed to achieve continuous, automated data flows across all providers and regions.

Despite strong system-level infrastructure, several critical elements remain underdeveloped. Patient portals (12.5%) show very low availability, indicating limited patient access to their own clinical information and limited integration of patient-reported outcomes (PROs). Similarly, 5-year survival tracking (12.5%) remains limited, constraining the system's ability to monitor long-term outcomes and benchmark performance.

The lowest perceived availability was observed for Socioeconomic data (6.25%), highlighting a major gap in the system's ability to capture contextual factors such as education, disability, unemployment and geographic disparities.

Overall, the results of this sub-domain indicate that Greece demonstrates a rather strong performance in core cancer data infrastructure, with high availability of registries, digital strategies, unique identifiers and medication-related data systems. These strengths provide a solid foundation for improving timeliness and coordination of cancer care.

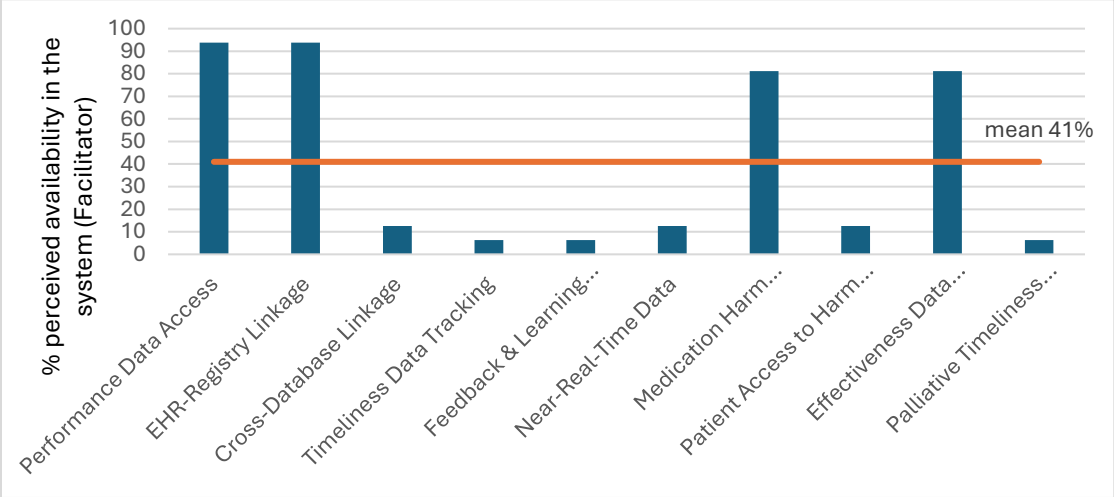
However, persistent weaknesses in utilizing socioeconomic data, patient-facing digital tools, interoperability, and long-term survival monitoring may limit the system's ability to fully leverage existing infrastructure for real-time decision-making, equity analyses and longitudinal care coordination.

1.c Data Use & Performance Monitoring

Data use and performance monitoring constitute prerequisites for a learning health system, enabling timely decision-making, continuous improvement and accountability across the cancer care pathway. Within Cluster 1, this sub-dimension assesses whether data infrastructure is actively used to monitor performance, track timeliness, evaluate treatment effectiveness and support system-level learning.

Figure 3 presents stakeholder perceptions regarding the availability and use of performance-related data in cancer care. Across all indicators, the average perceived availability was 41%, indicating a moderate level of system readiness, with several foundational capabilities in place, while significant gaps remain in the system's ability to leverage data for real-time monitoring, cross-sectoral linkage and continuous learning.

Figure 3. Cluster 1: Timeliness of care – (c) Data use and performance monitoring



Stakeholders reported very high availability for two critical system functions; Performance data access (93.75%), and EHR–registry linkage for monitoring novel cancer drugs (93.75%). These results indicate that Greece has established mechanisms for accessing performance data at national, organizational and clinical levels, and that linkages between electronic health records and the cancer registry are sufficiently developed to support effectiveness research for new therapies. Similarly, Medication harm monitoring (81.25%) and Effectiveness data capture (81.25%) reflect strong capabilities in monitoring treatment safety and outcomes.

These high-availability indicators demonstrate that Greece possesses several of the core analytical tools required for evidence-based decision-making and evaluation of clinical innovations.

Near-real-time data availability scored 12.5%, indicating that, while some performance data are accessible, they are not consistently updated at the frequency required to support rapid decision-making or operational responsiveness. This aligns with stakeholder feedback noting that many digital capabilities remain in pilot or early implementation phases, limiting their system-wide impact.

Despite strong foundations in performance data access, several essential components of a learning health system remain severely underdeveloped: Cross-database linkage (12.5%), Timeliness data tracking (6.25%), Feedback and learning systems (6.25%), Patient access to harm data (12.5%) and Palliative timeliness monitoring (6.25%).

These results reveal major constraints in the system's ability to integrate data across public health, primary care, pathology and hospital settings. The absence of time-stamped data across linked databases limits the capacity to monitor delays in diagnosis, treatment initiation and palliative care access—core elements of timeliness.

The very low availability of feedback and learning mechanisms suggests that Greece lacks structured processes for translating performance data into system improvement. This finding is consistent with the SWOT analysis, which identifies limited transparency, absence of timeliness indicators and insufficient monitoring of preventable harms as key weaknesses.

Overall, the results in Figure 3 indicate that Greece demonstrates strong capabilities in performance data access, treatment effectiveness monitoring and medication safety surveillance, reflecting important progress in building a data-driven cancer care system. However, these strengths are offset by critical gaps in cross-sectoral data linkage, real-time monitoring, timeliness tracking, and system-level learning mechanisms.

CLUSTER 2: COORDINATION OF CARE

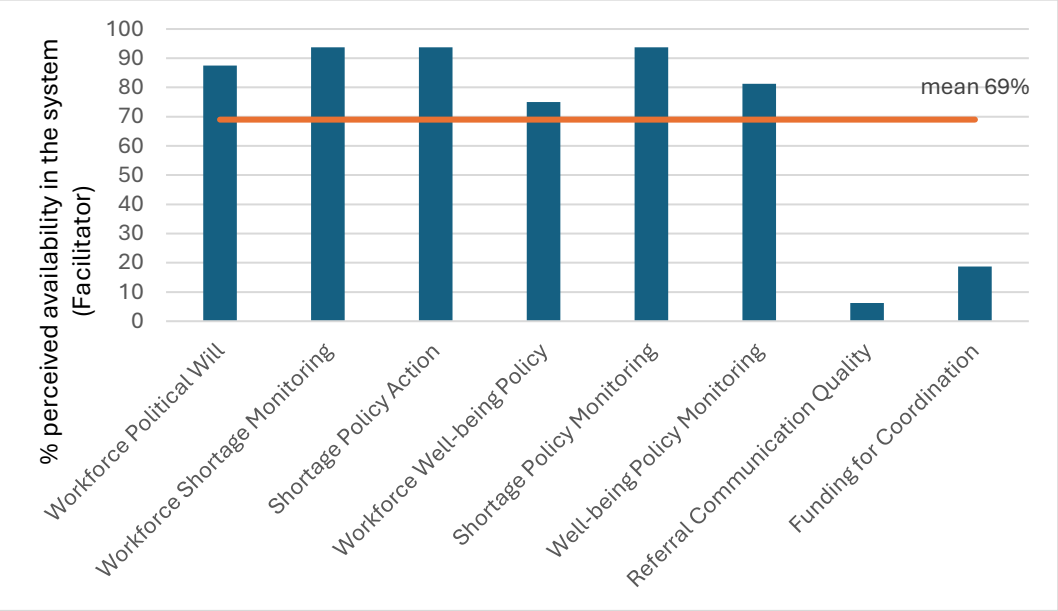
Coordination of care is a core pillar of cancer system efficiency, as fragmented communication, unclear referral pathways and inconsistent transitions between care levels can lead to delays, duplication of services and avoidable patient burden. Cluster 2 assesses the level of workforce capacity, oncology nursing, cancer patient navigators, task sharing and substitution, multidisciplinary tumor boards, and comprehensive cancer centers to ensure seamless, continuous and well-integrated cancer care.

2.a Workforce Capacity

Workforce capacity is a central determinant of coordinated cancer care, as timely diagnosis, treatment and follow-up depend on the availability, distribution and well-being of specialized professionals across the care continuum. Within Cluster 2, this sub-dimension assesses the policies, monitoring mechanisms and operational structures required to ensure a sufficient, supported and well-coordinated oncology workforce.

Figure 4 summarizes stakeholder perceptions regarding the availability of workforce-related facilitators that support coordinated cancer care. Across all indicators, the average perceived availability is 69%, indicating a moderately strong level of system readiness, though marked by significant variation between policy-level commitments and operational implementation.

Figure 4. Cluster 2: Coordination of care – (a) Workforce capacity



Stakeholders reported very high availability for several foundational elements of workforce planning and policy action. Workforce shortage monitoring (93.75%), Shortage policy action and

Shortage policy monitoring both scored 93.75%, at the top of the scale, indicating that Greece has identified workforce gaps in oncology and has established policies to address them.

Similarly, political will to improve workforce conditions scored high (87.5%), reflecting strong national-level acknowledgement of the need to invest in working conditions, safety and well-being for healthcare professionals. Policies to improve workforce well-being (75%) and their monitoring (81.25%) further demonstrate that Greece has taken steps to support the oncology workforce through structured policy initiatives. These strengths suggest that Greece has established the strategic and regulatory foundations required to address workforce challenges, even if implementation remains uneven.

Stakeholder interviews highlighted that, although reforms exist on paper, many remain dependent on pilot programmes or limited-scale initiatives, echoing the SWOT-identified risk of slow scale-up and variable regulatory alignment across levels of care.

Despite strong policy foundations, two indicators revealing severe weaknesses that directly affect coordination of care are Referral communication quality (6.25%) and Funding for coordination (18.75%). The extremely low availability of effective communication channels between general practitioners and secondary care professionals indicates a major bottleneck in timely referrals, feedback loops and continuity of care. This finding is consistent with stakeholder feedback describing fragmented communication pathways and limited integration between primary and specialized oncology services. Similarly, the low availability of funding to scale and disseminate coordination approaches suggests that Greece lacks the financial mechanisms needed to operationalize care coordination models at national level.

Overall, the results in Figure 4 indicate that Greece demonstrates strong political commitment and well-developed policy frameworks for addressing oncology workforce shortages and improving working conditions. These strengths provide a solid foundation for enhancing coordination of care. However, persistent weaknesses in referral communication, funding for coordination, and system-wide implementation of workforce policies significantly limit the ability of the health system to ensure seamless transitions across care levels. Without effective communication channels and dedicated funding, even well-designed workforce policies may fail to translate into improved coordination and timely cancer care.

2.b Oncology Nurses

Oncology nurses play a pivotal role in ensuring coordinated, continuous and patient-centered cancer care. Their responsibilities span chemotherapy administration, symptom management, patient education, psychosocial support and navigation across the care pathway. This sub-dimension assesses the establishment and implementation of regulatory frameworks,

staffing standards, monitoring mechanisms and digital tools required to support oncology nurses in delivering safe, high-quality and well-coordinated care.

Figure 5. Cluster 2: Coordination of care – (b) Oncology nurses

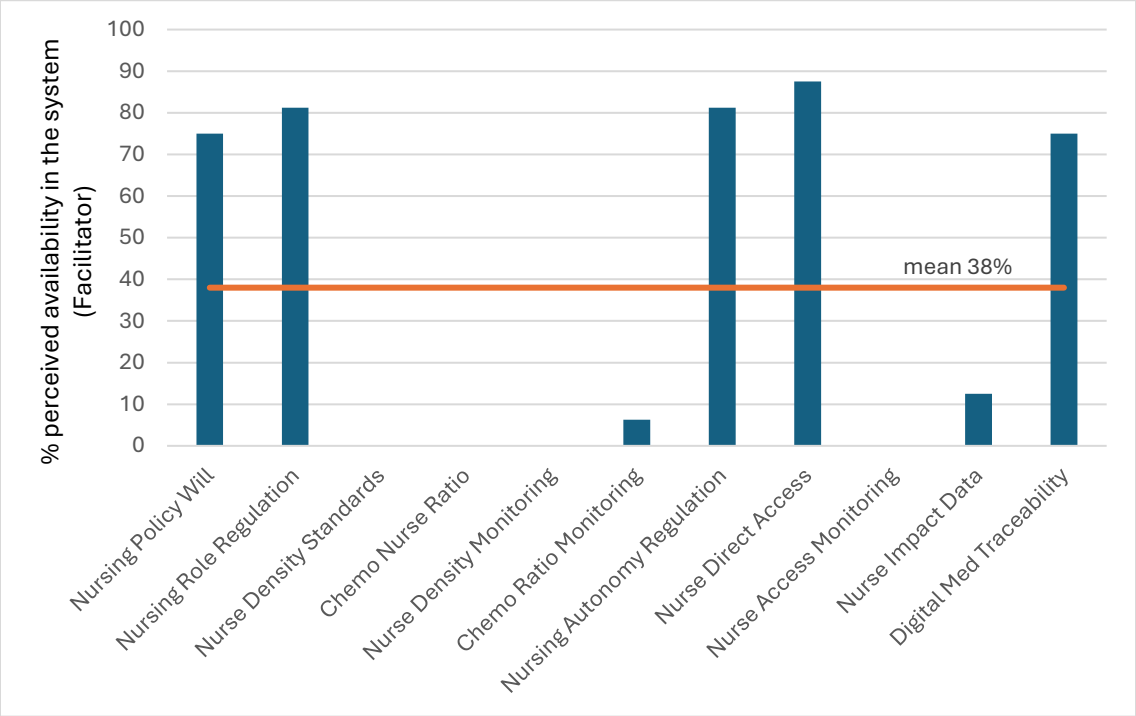


Figure 5 presents stakeholder perceptions regarding the availability of oncology-nursing-related enablers. Across all indicators, the average perceived availability was 38%, reflecting a mixed readiness profile: strong regulatory foundations and professional access coexist with major gaps in staffing standards, monitoring and data availability.

Stakeholders reported high availability for several core elements of oncology nursing practice. Political will to regulate oncology nursing roles (75%) and formal regulation of the cancer care nurse role (81.25%) indicate that Greece has established a clear framework for defining oncology nursing responsibilities. Regulations supporting nursing autonomy (81.25%) and the high availability of direct access to oncologists and other physicians (87.5%) further demonstrate that oncology nurses are well-integrated into clinical teams and maintain close contact with patients and families.

Digital medication traceability systems scored 75%, indicating that many cancer centers have implemented digital tools to reduce medication-related harm and administrative burden for oncology nurses.

Despite strong regulatory foundations, the results reveal severe weaknesses in the operational and monitoring dimensions of oncology nursing, namely Nurse density standards (0%), Chemotherapy nurse-to-patient ratio standards (0%), Monitoring of nurse density (0%), Monitoring of chemotherapy ratios (6.25%) and Data on nursing impact (12.5%).

These findings indicate that Greece lacks national or regional standards determining the minimum number of oncology nurses required per population or per chemotherapy workload. The absence of monitoring mechanisms means that staffing adequacy cannot be systematically assessed, and variations across hospitals remain unaddressed.

Equally concerning is the lack of data on the impact of oncology nurses on patient outcomes and care experiences. Without such data, it is difficult to evaluate the effectiveness of nursing roles, identify gaps in care delivery or support evidence-based workforce planning.

Overall, the results in Figure 5 indicate that Greece demonstrates strong regulatory and clinical integration of oncology nurses, supported by clear role definitions, autonomy frameworks and digital tools that enhance medication safety. These strengths provide a solid foundation for expanding the contribution of oncology nurses to coordinated cancer care.

However, the absence of staffing standards, monitoring mechanisms and impact data significantly limits the system's ability to ensure adequate nurse availability, manage workload pressures and evaluate the contribution of oncology nursing to patient outcomes. These gaps undermine coordination of care and may contribute to delays, variability in service quality and increased burden on clinical teams.

2.c Cancer Patient Navigators

Cancer patient navigators are internationally recognized as a key mechanism for the improvement of care coordination, reducing delays and supporting patients as they move across complex diagnostic and treatment pathways. Navigators help patients overcome organizational, logistical and informational barriers, ensuring continuity, timely referrals and improved patient experience.

Figure 6 summarizes stakeholder perceptions regarding the availability of patient navigation related facilitators. Across all indicators, the perceived availability was 0%, indicating that no formal structures, policies or monitoring mechanisms currently exist to support cancer patient navigation within the Greek health system.

Figure 6. Cluster 2: Coordination of care – (c) Cancer patient navigators

In particular, stakeholders reported no availability for political debate or policy initiatives aimed at regulating the role of cancer patient navigators (0%). Similarly, there is no regulation of navigator roles at national, regional or organizational levels (0%). This absence of political and regulatory foundations stands in contrast to the stronger policy environment observed for oncology nurses and workforce planning.

All indicators related to staffing structures and monitoring scored 0%, including Navigator staffing ratios, Monitoring of navigator density and Regulation alignment across governance levels. This indicates that Greece has not yet defined the number of navigators required per population, nor established mechanisms to monitor staffing adequacy or workload distribution. Without such standards, it is not possible to ensure equitable access to navigation services or to integrate navigators into multidisciplinary care teams.

Additionally, stakeholders reported no availability of data systems to monitor the impact of patient navigators on outcomes, care experiences or pathway efficiency (0%). The absence of such data hinders the ability to evaluate the potential benefits of navigation programmes or to build an evidence base for policy development.

Finally, stakeholders indicated that cancer patient navigators do not manage care pathways from diagnosis through follow-up (0%). This confirms that navigation services are not currently implemented in Greece, either formally or informally, and that patients must navigate the system largely on their own or rely on informal support from clinicians and family members.

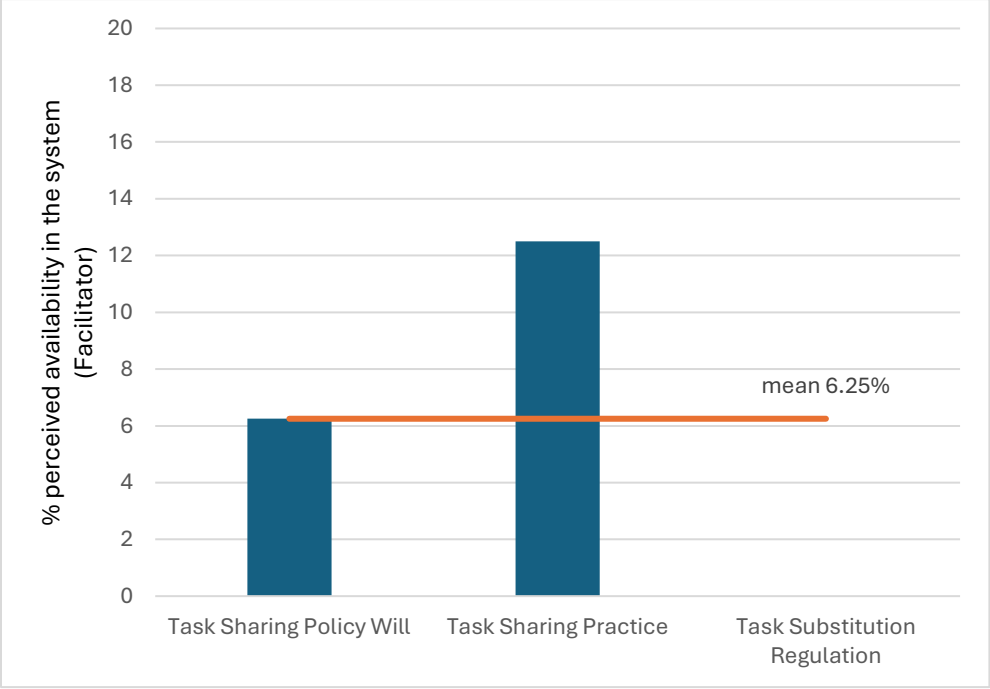
Overall, the results in Figure 6 indicate that Greece currently has no formal patient navigation structures, representing one of the most significant gaps in the coordination of cancer care. This absence has important implications for the involved groups, as patients may experience fragmented care, inconsistent communication and avoidable delays, while clinicians may face increased administrative burden without dedicated navigation support. Moreover, vulnerable populations may be disproportionately affected due to limited health literacy or social support.

2.d Task Sharing and Substitution

Task sharing and substitution are increasingly recognized as essential strategies for improving coordination of care, addressing workforce shortages and enhancing system efficiency. In cancer care, these approaches allow appropriately trained professionals to assume specific clinical or administrative responsibilities that are traditionally performed by other roles, thereby reducing bottlenecks, improving timeliness and supporting multidisciplinary collaboration.

Figure 7 presents stakeholder perceptions regarding the availability of task-sharing-related enablers. Across all indicators, the average perceived availability was 6%, indicating that task sharing and substitution are almost entirely absent from the current cancer care delivery model.

Figure 7. Cluster 2: Coordination of care – (d) Task sharing and substitution



Stakeholders reported very low availability for political will to regulate task sharing (6.25%). This suggests that, unlike other areas of workforce policy, such as oncology nursing, task sharing has not yet emerged as a priority within national health policy discussions. The absence of political

momentum limits the potential for structural reforms that could redistribute tasks across professional groups to improve coordination and efficiency.

Task sharing practices scored 12.5%, indicating that some degree of informal task redistribution may occur in isolated settings, likely driven by local needs or workforce shortages. However, the absence of national legislation or regulatory frameworks (0%) means that such practices are neither standardized nor supported by formal governance structures.

This lack of regulation creates variability in practice, potential risks to care quality and missed opportunities to optimize the use of available workforce capacity.

Stakeholders reported 0% availability for regulatory alignment related to task substitution. This indicates that Greece lacks coordinated policies defining which tasks can be shared or delegated across professional groups, such as between oncologists, oncology nurses, radiographers, pharmacists or other specialized roles.

Overall, the results in Figure 7 indicate that Greece currently has virtually no formal structures, policies or regulatory mechanisms to support task sharing and substitution in cancer care. While informal practices may exist in some settings, the absence of national frameworks limits the potential for systematic improvements in coordination, timeliness and workforce efficiency.

2.e Multidisciplinary Tumor Boards

Multidisciplinary tumor boards (MDTs) are a fundamental prerequisite for coordinated cancer care, ensuring that diagnostic and treatment decisions are informed by the expertise of multiple clinical disciplines. MDTs support continuity, reduce variability in clinical practice and enhance the quality and timeliness of care.

Figure 8. Cluster 2: Coordination of care – (e) Multidisciplinary tumor board

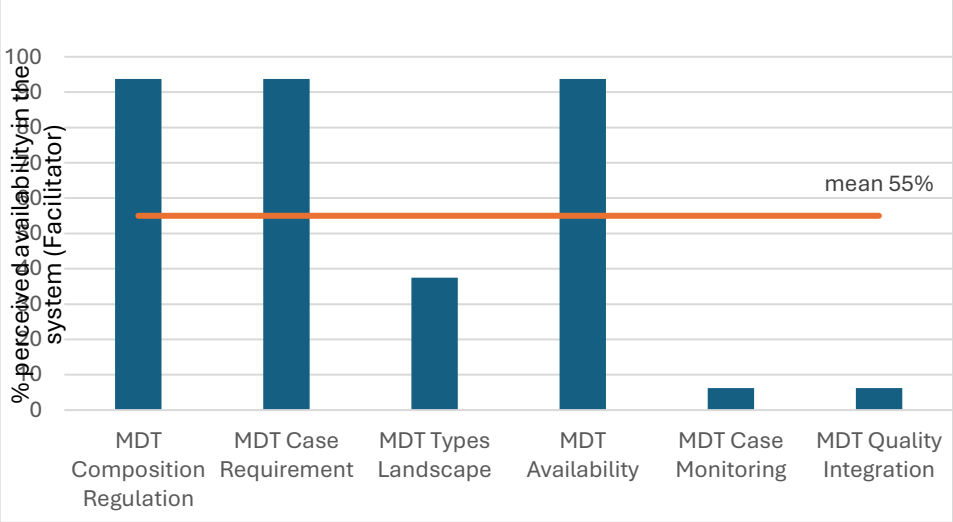


Figure 8 presents stakeholder perceptions regarding the availability of MDT-related enablers in Greece. Across all indicators, the average perceived availability was 55%, reflecting a strong regulatory foundation and widespread MDT availability, but also significant gaps in monitoring and quality assurance.

Stakeholders reported very high availability for several core MDT components. National legislation regulating MDT composition (93.75%) and requiring that cancer cases be discussed in MDTs (93.75%) indicates that Greece has established a robust legal framework governing multidisciplinary care. MDT availability across cancer types also scored high (93.75%), suggesting that most patients have access to multidisciplinary review following diagnosis.

The landscape of MDT types scored 37.5%, indicating that while MDTs are widely present, their structure, composition and operational models vary considerably across hospitals and regions. Stakeholder feedback suggests that some MDTs operate within single hospitals, while others involve cross-hospital collaboration or tumor-specific boards. This variability reflects a system where MDTs are mandated but not uniformly implemented, potentially affecting consistency and coordination across care settings.

Despite strong regulatory foundations, two indicators revealed very low availability: MDT case monitoring (6.25%) and MDT integration into quality assurance mechanisms (6.25%). These findings indicate that Greece lacks systematic monitoring of whether cancer cases are actually discussed in MDTs, whether exceptions are justified or whether MDT participation influences treatment quality and outcomes. Similarly, MDT access is not yet embedded in national quality assurance frameworks, limiting the system's ability to evaluate MDT performance or ensure equitable access across regions.

Overall, the results in Figure 8 indicate that Greece demonstrates strong regulatory commitment and widespread availability of MDTs, providing a solid foundation for coordinated cancer care. However, the absence of systematic monitoring and limited integration into quality assurance mechanisms significantly constrain the potential of MDTs to improve care consistency, timeliness and outcomes.

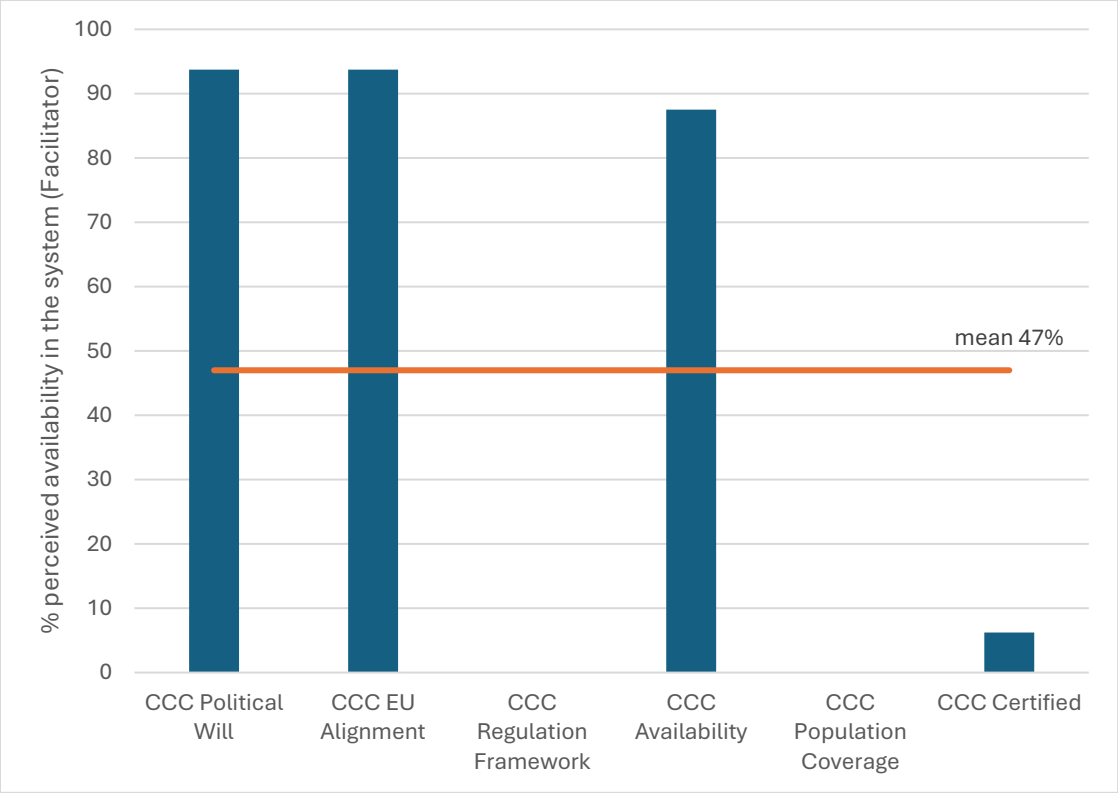
2.f Comprehensive Cancer Centers

Comprehensive Cancer Centers (CCCs) represent an advanced organizational model for delivering integrated, multidisciplinary and research-driven cancer care. They bring together prevention, diagnosis, treatment, rehabilitation, palliative care, education and research within a single coordinated structure.

Figure 9 presents stakeholder perceptions regarding the availability of CCC-related facilitators in Greece. Across all indicators, the average perceived availability was 47%, reflecting a rather strong political

momentum and emerging institutional structures, but also significant gaps in legislation, certification and equitable population coverage.

Figure 9. Cluster 2: Coordination of care – (f) Comprehensive cancer centers



Stakeholders reported very high availability (93.75%) for political discussions on CCC implementation and Greece's participation in the EU CraNe Joint Action network. These findings indicate that CCC development is recognized as a national priority and that Greece is aligned with European efforts to establish a network of accredited CCCs across member states.

The availability of certified CCCs also scored high (87.5%), suggesting that Greece has already at least one established CCC that meets recognized standards for comprehensive cancer care. This represents an important step toward building a national CCC ecosystem capable of supporting integrated care, research and innovation. Nevertheless, the certification process for CCCs has been slow, with the respective facilitator receiving 6.25%.

Despite strong political momentum, stakeholders reported 0% availability for national legislation regulating CCC composition, implementation and access. This indicates that Greece lacks a formal legal framework defining what constitutes a CCC, how centers should be structured and how patients should access them.

Population coverage scored 0%, revealing that, so far, existing CCCs do not yet serve the entire population. This limited coverage may contribute to regional disparities in access to multidisciplinary care, clinical trials and specialized oncology services.

Overall, the results in Figure 9 indicate that Greece demonstrates strong political commitment and emerging institutional capacity for developing comprehensive cancer centers. Participation in EU networks and the presence of certified CCCs provide a solid foundation for advancing integrated, high-quality cancer care.

However, the absence of national legislation and the limited population coverage of CCCs significantly constrain the system's ability to ensure equitable access and consistent standards across regions. Without a clear regulatory framework, CCC development may proceed unevenly, limiting the potential for system-wide improvements in coordination, research integration and patient outcomes.

CLUSTER 3: PATIENT-CENTEREDNESS

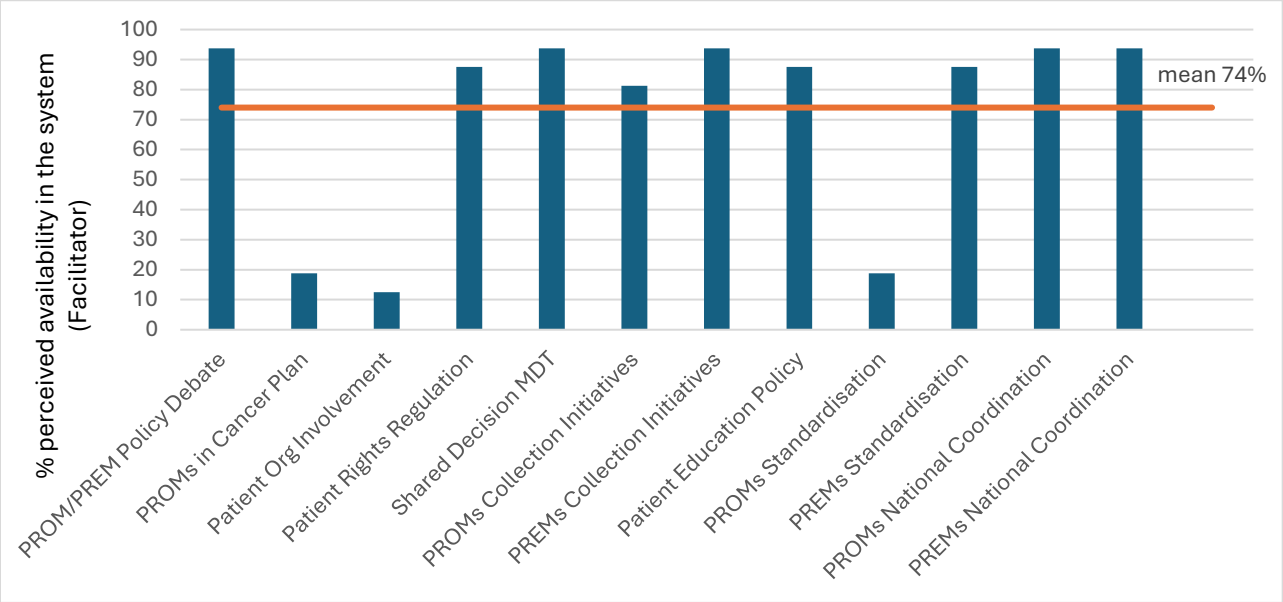
Patient-centeredness is a defining dimension of cancer system efficiency, as it reflects the degree to which care is organized around the needs, preferences and lived experiences of people with cancer. This cluster assesses the organizational structures, communication mechanisms, support services and data-driven tools required to ensure that patients are informed, empowered and actively supported throughout their cancer journey.

3.a Legal Frameworks and Strategy, Policy Context and Funding

Patient-centeredness requires that health systems embed the voices, preferences and experiences of people with cancer into policy design, service delivery and data collection. This sub-domain focuses on political commitment, legal frameworks, strategic planning processes and funding mechanisms necessary to support meaningful patient involvement and the systematic use of patient-reported measures.

Figure 10 presents stakeholder perceptions regarding the availability of patient-centeredness enablers. Across all indicators, the average perceived availability was 74%, reflecting a strong legal and strategic foundation, but also significant gaps in patient education, policy integration and the embedding of patient-reported measures into national cancer planning.

Figure 10. Cluster 3: Patient-centeredness – (a) Legal frameworks and strategy, policy context and funding



Stakeholders reported very high availability for several core elements of patient involvement. Political debate on patient engagement (93.75%) and legislation supporting patient rights in decision-making (93.75%) indicate that Greece has established a strong legal and policy environment for patient participation. Patient organizations are also considered to be actively involved in shaping long-term cancer control plans (87.5%), reflecting a mature culture of stakeholder engagement.

Similarly, Greece demonstrates strong readiness in the collection and standardization of patient-reported outcome measures (PROMs) and patient-reported experience measures (PREMs). PROMs collection initiatives (93.75%), PREMs initiatives (87.5%), PROMs standardization (87.5%), PREMs standardization (93.75%) and national coordination of both PROMs and PREMs (93.75%) all scored highly. These results indicate that Greece has developed a structured and coordinated approach to capturing patient-reported data—an essential component of patient-centered care and system performance monitoring.

Shared decision-making during or after multidisciplinary team (MDT) discussions scored 81.25%, suggesting that while patient engagement is increasingly recognized in clinical settings, implementation may vary across hospitals and cancer types. This reflects a system where patient involvement is supported by legislation but not yet uniformly embedded in everyday clinical practice.

Despite strong foundations, several indicators reveal important gaps, namely PROMs in the national cancer plan (12.5%), PROM/PREM policy debate (18.75%), and Patient education policy (18.75%). These findings indicate that although PROMs and PREMs are widely collected and standardized, they are not yet fully integrated into national cancer strategy development, which limits the potential for patient-reported data to inform policy decisions, resource allocation and quality improvement.

Similarly, the low availability of patient education policies suggests that Greece lacks comprehensive programmes to support patients and families in understanding their disease, navigating the care pathway and participating in treatment decisions.

Overall, the results in Figure 10 indicate that Greece demonstrates strong political commitment, robust legal frameworks and advanced PROM/PREM infrastructure, providing a solid foundation for patient-centered cancer care. However, the limited integration of patient-reported measures into national planning and the absence of comprehensive patient education policies constrain the system's ability to fully realize the benefits of patient-centeredness.

3.b Data Governance, Use, and Reporting

Effective patient-centered cancer care requires not only the collection of patient-reported data but also the integration of these data into clinical systems, decision-making processes and quality improvement mechanisms. This sub-dimension assesses the digital infrastructure, governance mechanisms and operational practices necessary to ensure that patients have access to their own clinical information and that PROMs and PREMs are systematically embedded and used across the cancer care pathway.

Figure 11. Cluster 3: Patient-centeredness – (b) Data governance, use, and reporting

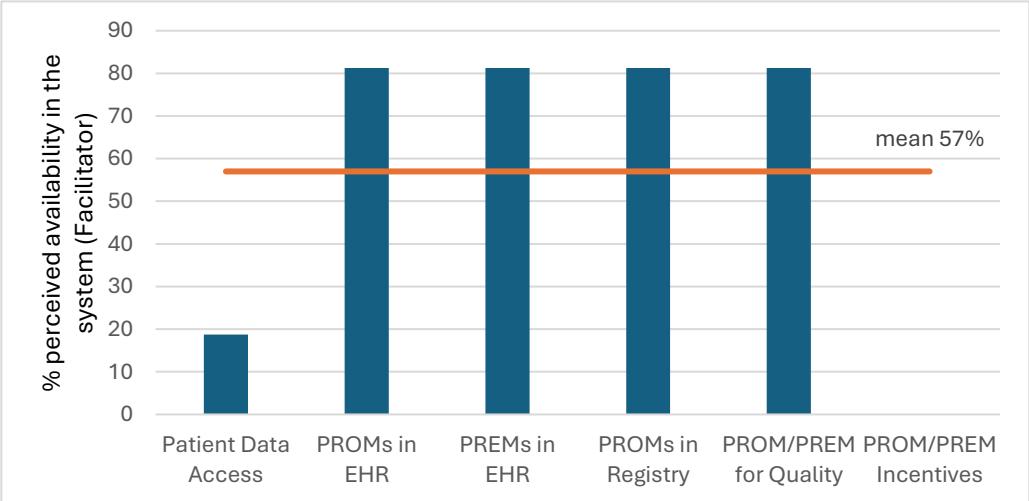


Figure 11 presents stakeholder perceptions regarding the availability of data-related facilitators that support patient-centeredness. Across all indicators, the average perceived availability was 57%, reflecting strong integration of PROMs and PREMs into data systems, but also significant gaps in patient access and incentive structures.

Stakeholders reported very high availability for the embedding of PROMs and PREMs into the health data ecosystem. PROMs and PREMs in EHRs, as well as PROMs in cancer registries and the use of PROM/PREM data for quality improvement all scored strongly (81.25% each). These results indicate substantial progress in integrating patient-reported data into routine clinical documentation and system-level performance monitoring.

Patient access to their own clinical data scored 18.75%, revealing a significant gap in patient empowerment. While PROMs and PREMs are well embedded in the system, patients themselves have limited ability to view, download or use their clinical information.

The lowest score in this sub-dimension was observed for PROM/PREM incentives (0%), indicating lack of mechanisms - financial, regulatory or operational - to encourage systematic collection of patient-reported data. Without incentives, PROM and PREM collection may remain inconsistent across hospitals and cancer centers, limiting the ability to use these data for benchmarking, quality improvement or policy development.

Overall, the results in Figure 11 indicate that Greece demonstrates strong digital integration of patient-reported measures, with PROMs and PREMs embedded in EHRs, cancer registries and quality improvement processes. These strengths provide a solid foundation for advancing patient-centered cancer care.

However, limited patient access to clinical data and the absence of incentive mechanisms significantly constrain the system's ability to fully leverage patient-reported information. Without empowering patients to engage with their own data and without incentives to ensure consistent data collection, the potential of PROMs and PREMs to drive meaningful improvements in care quality and patient experience remains underutilized.

SWOT ANALYSIS

Taking into consideration the findings from the Qualitative and Quantitative Analysis as presented above, we performed a SWOT Analysis. The Analysis presents the identification of major gaps, barriers, strengths & opportunities for the improvement of cancer care efficiency in Greece.

- Political will and funding to invest in national health data and cancer data ecosystems
- Regulatory and training frameworks for oncology supportive/palliative care
- Legislation for cancer data registration and care performance with national monitoring; Digital strategies and alignment at national/regional levels; cancer data included in national strategy
- Dedicated organization for cancer data infrastructure and an implemented cancer registry; registry captures cancer staging at diagnosis
- National EHR presence with digital medication management unique patient identifier enabling data linkage; interoperability pilots; Near real-time registry updates; data on quality of care and medications; digitalization strategy for cancer meds interfacing with EHRs.
- Availability of performance data for decision-making at multiple levels; linking EHRs and registries to monitor novel drugs.
- Multidisciplinary tumor boards, comprehensive cancer centers (CCCs), EU network participation; patient-reported measures (PROMs/PREMs) programs and patient access to data.
- Regulation and roles for cancer nurses; patient navigators concepts under discussion

WEAKNESSES

- No national cancer control plan/strategy in place — strategic direction missing.
- No standardized care pathways or waiting-time standards; no timeliness indicators publicly available
- No national strategy to monitor preventable medication harms); 5-year survival monitoring not in place
- Data dimensions gaps: registry lacks education/ disability data; limited data linkage across public health, primary care, and pathology
- Limited patient portal access and many capabilities in pilot/development status (
- Workforce metrics underdeveloped: nursing staffing ratios, patient access to oncology nurses; ongoing shortages
- Variable regulatory alignment across levels; some reforms depend on pilots rather than nationwide scale

OPPORTUNITIES

- Finalize and implement a national cancer control plan; establish standardized care pathways
- Develop and publish timely indicators for waiting times and quality; enhance public reporting
- Strengthen nationwide data linkage and preventable-harm monitoring; close data gaps
- Scale interoperability and real-time registry capabilities; leverage data for monitoring novel therapies

- Expand PROMs/PREMs programs; empower patient education and access to data
- Optimize workforce policy: monitor nurse staffing, navigator roles, working conditions; align regulations
- Accelerate expansion of CCCs and EU-network participation; harness national data for integrated care

THREATS

- Implementation gaps due to many items remaining in pilots/development; risk of slow scale-up.
- Absence of a national cancer control plan impeding coherence and accountability
- Lack of transparent indicators may impede performance improvement
- Data fragmentation risk if public health, primary care, and hospital data remain poorly linked
- Workforce rollout and funding sustainability risks; uneven monitoring of nursing and navigator roles
- Regulatory fragmentation across levels; dependence on pilot status for core capabilities

POLICY RECOMMENDATIONS AND IMPLICATIONS

The findings of the Greek pilot reveal a health system with significant assets, such as strong political will, advanced digital strategies, emerging data infrastructures, and committed clinical professionals, while also constrained by fragmentation, uneven implementation, and persistent gaps in governance, coordination, and patient empowerment. Translating these strengths into meaningful improvements in cancer care efficiency will require a set of targeted, system-level reforms grounded in the qualitative and quantitative analyses and the opportunities identified in the SWOT analysis.

The most foundational priority is the development of a comprehensive, evidence-based National Cancer Control Plan covering prevention, early detection, diagnosis, treatment, survivorship, palliative care, and research. The absence of such a plan is currently one of the most significant barriers to system coherence. A designated governance body should be made responsible for its implementation, monitoring, and evaluation, with structured updating cycles to ensure the plan remains aligned with emerging evidence and across national, regional, and organizational levels. This would provide strategic direction, reduce variability, and enable coordinated investment across the cancer pathway.

Closely linked to governance is the need for standardized care pathways and waiting time standards. Timeliness currently varies substantially across hospitals and regions, and the introduction of national pathways for major cancer types, with clear referral criteria, timelines, and performance monitoring, would reduce unwarranted delays, support more equitable access to care and reduce out of pocket household payments for health, which remain among the highest in European level. Equally important is the acceleration of data linkage and interoperability across electronic health records, cancer registries, pathology systems, primary care, and public health databases. Despite strong digital foundations, operational integration remains limited. Expanding real-time data flows, linking clinical data with medication harm monitoring systems, and addressing gaps in socioeconomic data capture would enable Greece to function as a learning health system capable of continuously monitoring performance and improving care coordination.

Workforce constraints represent another critical bottleneck. Shortages and rigid role boundaries undermine coordination and timeliness across the pathway. National staffing standards for oncology nurses, pathologists, radiologists, and other key roles, combined with regulatory frameworks for task-sharing and structured training programmes, would improve continuity, reduce system-wide bottlenecks, and enhance resilience. Complementing this, the introduction of cancer patient navigation services — currently entirely absent — would reduce fragmentation, support timely referrals, and improve the patient experience, with particular benefit for

vulnerable populations including older adults, those with low health literacy, and individuals with limited social support.

Multidisciplinary teams (MDTs) are widely available in Greece but remain insufficiently monitored. Establishing national systems to track MDT participation and case coverage, and integrating MDT performance into quality assurance mechanisms, would improve consistency and decision quality across the pathway. The expansion and regulation of Comprehensive Cancer Centers (CCCs) is also a priority: while political momentum exists, regulatory frameworks defining CCC standards, composition, and access criteria remain underdeveloped. A robust, nationally certified CCC network would serve as the backbone for integrated, multidisciplinary, and research-driven cancer care.

Patient centeredness requires deliberate attention. Expanding patient access to clinical data through secure digital portals, developing national education programmes on prevention and shared decision-making, and ensuring consistent implementation of these practices across MDTs would empower patients to navigate the system more effectively and participate more meaningfully in their care. Greece also has strong infrastructure for patient-reported outcome and experience measures (PROMs/PREMs), but this data remains insufficiently integrated into planning. Embedding PROMs and PREMs into the NCCP, supported by appropriate incentive mechanisms, would make patient-reported evidence a central driver of quality improvement and resource allocation.

Finally, many of the initiatives described above depend on pilot funding or temporary streams, and long-term sustainability cannot be assumed. Establishing dedicated funding for care coordination, digital integration, and workforce development — and ensuring that screening programmes currently supported by the Recovery and Resilience Fund are placed on a durable footing — would allow Greece to move beyond fragmented pilots toward a coherent transformation strategy.

Taken together, these reforms outline a pathway for Greece to transition from a system with strong assets but fragmented implementation to a cohesive, data-driven, patient-centered cancer care ecosystem — one capable of reducing delays, improving coordination and continuity, strengthening equity, and supporting evidence-based policy and resource allocation.

CONCLUSIONS

The Greek pilot implementation of the All.Can Action Guide for Efficient Cancer Care provides a comprehensive and structured assessment of the country's readiness to deliver efficient, timely, coordinated and patient centered cancer care. The findings reveal a system with significant strengths; notably, strong political commitment to digital transformation, emerging data infrastructures, widespread multidisciplinary care, and a highly dedicated clinical workforce. These assets form a solid foundation for future reform.

At the same time, the analysis highlights persistent structural weaknesses that limit Greece's ability to translate these strengths into improved outcomes for patients. The absence of a national cancer control plan, fragmented governance, limited pathway standardization, and insufficient performance monitoring create a system where progress is uneven and dependent on local initiative rather than a coordinated national strategy. Workforce shortages, particularly in oncology nursing and pathology, further constrain the system's capacity to deliver timely and equitable care.

Coordination of care remains fragmented by weak referral pathways, limited communication between primary and secondary care, and the complete absence of patient navigation services. While multidisciplinary tumor boards are widely available and supported by legislation, monitoring and quality assurance mechanisms are underdeveloped. Comprehensive Cancer Centers show strong political momentum but lack the regulatory frameworks and population coverage needed to function as national hubs of excellence.

Patient centeredness is an area of both promise and challenge. Greece has made notable progress in embedding PROMs and PREMs into digital systems and coordinating their collection at national level. However, patient access to clinical data, structured education programs, and consistent shared decision making remain limited. Without these elements, the system cannot fully realize the benefits of patient reported information or ensure that care aligns with what matters most to patients.

Taken together, the findings depict a system at a critical inflection point. Greece has many of the building blocks required for a modern, learning cancer care system—digital strategies, registries, multidisciplinary structures, and engaged stakeholders. What is now required is strategic consolidation: a national plan, clear governance, standardized pathways, robust monitoring, and sustained investment in workforce and coordination mechanisms.

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