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Integrating early cancer care into one pathway: Comparison across Denmark, the Netherlands and Italy

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ABSTRACT

Background: Extant cancer-specific frameworks have advanced our understanding of policies and initiatives aimed at strengthening early diagnosis and integrated supportive care. Complementing these contributions, this study examines the organisational and inter-organisational mechanisms through which health literacy, early detection, early diagnosis and early treatment are connected into an early cancer care pathway across different healthcare systems.

Methods: We identified three case studies (Denmark, the Netherlands and Italy) based on a variety of contexts and challenges in addressing strategies of integration in early cancer care. We adopted a multilevel conceptual framework to identify different dimensions of integration implemented in the early cancer care phases. This analysis was supported by a comprehensive desk review of institutional documents, reports, scientific literature and interviews with key informants from the selected countries.

Results: The application of a detailed conceptual model allowed us to understand the dimensions of integration implemented and their possible interaction in the three analysed cases. We found that structural integration is adopted for cross-cutting infrastructures and that process integration is followed for patient pathways and cancer networks, whereas health literacy is approached through interpersonal integration.

Conclusion: The ever-increasing complexity of cancer care, along with the number and diversity of stakeholders involved, has led policymakers and managers to implement integration strategies, yet comprehensive intervention strategies aimed at governing and managing the entire pathway are still lacking.

Policy Summary.

The World Health Organisation and the European Union emphasise the importance of models in cancer care organisation that ensure timeliness and continuity of care from early detection to diagnosis and treatment of cancer. However, less attention has been paid to the organisational and inter-organisational mechanisms through which cancer health literacy, early detection, diagnosis and early treatment are connected into an integrated pathway across healthcare systems. Therefore, we propose a multilevel conceptual model to help policymakers design policies and strategies from education to early treatment across three countries and inform their integration into a single pathway.

1. Introduction

Over the past two decades, advances in the early detection, diagnosis and treatment of breast, cervical and colorectal cancer have significantly improved outcomes. New technologies for prevention, diagnosis and treatment of early-stage tumours have positively affected survival probability and reduced the economic and social burden of cancer [1].

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Reports and guidelines published by the World Health Organisation (WHO) and the European Union (EU) outline the phases of a possible early cancer care (ECC) pathway [2,3], emphasising the importance of timely transitions from detection to diagnosis and, ultimately, treatment [4]. The EU's Joint Actions on cancer have indicated that enhancing early detection and care through comprehensive networks is equally relevant [5]. However, less is known about the organisational and inter-organisational mechanisms through which prevention through education, early detection, as well as early diagnosis and early treatment are connected into a unified ECC pathway across different healthcare systems.

Extant cancer-specific frameworks have advanced the understanding of integrated cancer care across different parts of the pathway. Koo et al. [6] provide guidance for designing and evaluating early diagnosis programmes for symptomatic cancer, identifying individual- and system-level factors—including health literacy and help-seeking behaviour—that influence timely presentation and diagnosis. Krishnasamy et al. [7] reframe supportive care as a core, multidisciplinary component of patient-centred cancer care, articulating domains of need, including informational and psychosocial support, which should be addressed across the cancer pathway. These frameworks are valuable in specifying the needs, evidence and conditions that should inform cancer care at different stages. However, they pay less attention to how the actors and organisations responsible for addressing these needs are coordinated across stages, or to how such coordination is organised across different health systems. Complementing these contributions, this study examines the organisational and inter-organisational mechanisms through which health literacy, early detection, diagnosis and early treatment are connected into an ECC pathway across different health systems. This requires an analytical lens able to distinguish the forms of integration through which actors, organisations and processes are coordinated across the pathway.

Integration refers to collaborative efforts among units, organisations or individuals to achieve a common goal and manage interdependencies through three mechanisms: standardisation, planning and mutual adjustment [8]. Valentijn et al. [9] expanded this concept by proposing the Rainbow Model of Integrated Care, identifying integration dimensions at various levels of the healthcare system (i.e. macro, meso, micro) or cross-cutting to the system itself. Building on this, Singer et al. [10] developed a comprehensive framework of intra- and inter-organisational integration for the case of chronic diseases. This model outlines five possible types of integration—structural, functional, normative, interpersonal and process— within or among the organisations involved in a healthcare pathway Specifically, each type of integration is based on different potential levers for integration and is characterised by specific sets of instruments and tools to achieve integration. Structural integration derives from the physical integration of operations, whereas functional integration encompasses coordination and accountability achieved through shared protocols or guidelines. Interpersonal integration employs team-based approaches, normative integration stems from ways of fostering a culture of integration and process integration involves designing coordinated service delivery processes.

The present study adopts Singer et al.'s [10] framework, first, to analyse the policies and strategies implemented across three countries—Denmark, the Netherlands and Italy—at each key step of ECC. We define ECC as the path leading from prevention through education (e.g. cancer health literacy), early detection, diagnosis and access to treatment at cancer stages I and II (i.e. early treatment). This journey requires the engagement of organisations that often belong to different parts of healthcare systems and beyond, as well as the coordination of diverse disciplinary skills and information sharing. Second, we assess how well the interdependencies among and within the steps in ECC are managed by mapping integration strategies and their degree of implementation. This analysis offers policymakers insights into current strategies for improving and advancing ECC as a unified pathway and provides suggestions for adapting these strategies to different contexts.

2. Methods

This study adopted a multiple case-study design to analyse the experiences of Denmark, the Netherlands and Italy in organising and delivering ECC [11]. Case study methodology provides a holistic view of a unit of analysis while considering contextual influences [12]. The unit of analysis was at the country level, and the analytical focus was on ECC for breast, cervical and colorectal cancers. These cancers were chosen due to their established ECC practices (e.g., screening programmes) and prevalence in many Western countries, making them ideal for examining integration strategies [13].

Countries were selected using purposive sampling to capture diverse ECC experiences and align with the theoretical framework [14]. We focused on European countries and drew on Böhm et al.'s [15] classification to ensure variety by choosing countries with different types of healthcare system, including both unitary and federal/decentralised governance structures. Contextual factors, such as financing models, legal frameworks and organisational arrangements were deemed relevant in choosing the country case studies, as these influence integration capabilities and are relatively immutable [10]. In brief, Denmark's is a tax-funded healthcare system in which the state oversees regulation and finances, while regions manage secondary and primary care and municipalities handle public health and rehabilitation [16]. Decision-making is highly integrated, involving all stakeholders in a quality-assurance cycle [17]. The Netherlands is a social insurance–based healthcare system with governance shared among the government, health insurers and professional bodies, which introduces structural fragmentation. Public health responsibilities are distributed across municipal health services and other organisations [18]. Although this framework has worked outstandingly so far, governance reforms are necessary to address emerging challenges of system fragmentation and increased demand and costs of care [19]. Italy operates a tax-funded, regionally decentralised healthcare system in which regional governments have significant autonomy, whereas the central government provides oversight [20]. This institutional framework often hinders coordination between national and regional decisions and their local implementation. The three case studies thus represent varying degrees of fragmentation in governance and healthcare delivery that could affect the degree of smooth integration on the ECC pathway [21].

We employed multiple data collection methods [12]. The desk research consisted of reviewing national cancer plans, screening programmes, white papers, and other relevant policy documents (Supplementary Table S1). Published statistical data, scientific reports and articles were also included to gain a comprehensive understanding of each case. Additionally, semi-structured interviews with key informants, valued for their expertise and contextual knowledge, informed all cases [11] (Supplementary Table S2). We content-analysed approximately 60 documentary sources and conducted 15 semi-structured interviews across the three countries: Denmark (20 sources, 4 interviews), Italy (28 sources, 7 interviews), The Netherlands (22 sources, 4 interviews). Interviews were conducted by two authors (MC and NO) between March and July 2024, using a semi-structured topic guide organised around the four ECC phases (health literacy, early detection, early diagnosis and early treatment), with country-specific probes tailored to the institutional actors and initiatives identified during the desk review. Informants were selected purposively based on their expertise in cancer policy design, service delivery or programme implementation to ensure contextual breadth and depth. We sought to balance representation across the cases by selecting comparable informant profiles (e.g., policymakers, clinicians, programme coordinators) and by complementing interview data with extensive document analysis to minimise potential national bias or imbalance. Interviews were audio-recorded, verbatim transcribed, validated by the interviewees and analysed thematically; emerging themes were subsequently mapped

onto Singer et al.'s [10] integration dimensions to support the classification reported in the Results. Finally, the informants reviewed the case reports for accuracy, helping to minimise potential misinterpretations. Ethical approval for conducting the interviews was granted by the Ethics Board of our University (no. EA000793).

Consistent with the distinction outlined above, the cancer-specific frameworks by Koo et al. [6] and Krishnasamy et al. [7] informed the conceptual framing of what ECC phases and system factors are relevant, while Singer et al.'s model provided the analytical categories used to classify how the actors and organisations responsible for those phases are coordinated into a single pathway. We therefore do not propose a separate cancer-care model, but use an integrative analytical framework that brings together elements often treated separately in the existing literature: the phases of early cancer care, the actors and institutions involved, the processes through which care is organised, and the levels of governance at which integration takes place. Accordingly, we adapted Singer et al.'s [10] model, originally developed in the context of chronic disease care, to analyse integration across the ECC pathway. Although the model distinguishes multiple "types" of integration, we treat them as dimensions of a single integration process, retaining Singer et al.'s labels (i.e., structural, functional, interpersonal, normative and process), because these forms can occur concurrently and with varying intensity across the pathway. This reframing supports pathway-level analysis, by emphasising how integration is configured through a range of dimensions. Accordingly, we examined the collected data, identified integration strategies and classified them according to the integration dimensions derived from Singer et al. [10]. We initially considered all five dimensions as deductive categories. However, the empirical material available for the three country cases provided limited evidence on shared values, culture, professional identity or collective commitment across organisations. Normative integration was therefore retained as a sensitising concept and was not included as a separate category in the final empirical mapping. Combining analysis of the collected data with the interviews also allowed us to assess, albeit only qualitatively, the degree of integration in ECC achieved by each country.

3. Results

3.1. ECC governance in the three countries

Denmark has consistently improved its cancer care over the past two decades [22], successfully addressing high mortality rates and surpassing the European average in key performance indicators, such as screening participation rates and early cancer detection [23]. Cancer care is centrally coordinated by the Danish Health Authority, an independent agency under the Ministry of Health, in collaboration with regional authorities, scientific societies, healthcare professionals and patient associations via working groups. Cancer Plans have provided an overall policy framework for cancer care in the country, initially strengthening evidence-based treatment and screening capacity and subsequently focusing on cancer rehabilitation and palliative care. Recent efforts emphasise cancer prevention and patient-centric care pathways.

In the Netherlands, advancements in diagnostics and therapeutics along with a robust cancer care network have improved five-year survival probability over the past decade [24]. Key enablers include a comprehensive national cancer registry, clinical auditing and ministerial coordination of screening programmes. The Netherlands Cancer Agenda, launched by the Netherlands Cancer Collective in 2023, replaced the expired National Cancer Control Plan. The document adopts a holistic, adaptable approach to reducing cancer's burden across its various stages and aligns with Europe's Beating Cancer Plan [25]. The Agenda fosters synergies with existing plans and initiatives through the Netherlands Cancer Collective, a coalition of over 100 parties, including patient associations, healthcare organisations and research centres.

In Italy, cancer survival is above the EU average [26], though significant regional disparities persist in governance and healthcare delivery. The recently introduced National Cancer Plan, developed collaboratively by national and regional governments, healthcare professionals, patient advocates and NGOs, aims to address these disparities, outlining strategic objectives in prevention, early diagnosis, multidisciplinary care, workforce training and digital health. Moreover, it defines indicators to monitor progress within regional healthcare services. While some regions employ peer evaluation for quality assurance in screening programmes, others rely on external mentorship, leading to inconsistent effectiveness. The recent implementation of cancer care networks marks a promising step towards integrating care pathways, though its uptake varies across regions.

In all three cases, the examination of involved actors and their respective roles throughout the ECC pathway - from education to early treatment - highlights the need to integrate deeply diverse contexts and stakeholders who are involved to varying extents and with diverse responsibilities and functions across all ECC phases (Supplementary Table S2).

In the next sub-sections, we present findings for each of the four retained integration dimensions in turn (structural, functional, interpersonal and process), describing how each is enacted across the ECC pathway and the extent to which their application varies between the three country cases.

3.1.1. Structural integration

In Denmark, the pursuit of economies of scale - through higher patient volumes and concentration of specialised expertise - has led to a significant centralisation of cancer diagnostic services. This process has been driven mainly by the goal of ensuring an efficient and sustainable use of advanced diagnostic technologies [27]. In addition, the Danish Regions' Clinical Quality Development Programme established a centralised information system to support an evidence-based quality-assurance framework and ensure a smooth care pathway. This was achieved through an extensive process that began with standardisation and harmonisation, followed by the alignment and centralisation of the information systems of all providers involved in the cancer care pathway.

In the Netherlands, the detection step of screening for breast, colorectal and cervical cancer has been integrated both horizontally and vertically. Since 2022, the five former regional screening foundations have been consolidated into one organisation managing all on-the-ground aspects of the screening process (horizontal integration). The entire chain is supported by the centralised electronic information system (ScreenIT). This structure standardises data collection, ensures uniform sample processing (through service-level agreements with suppliers and laboratories) and involves collaboration with healthcare professionals for continuous and timely care (i.e. vertical integration) [28]. Through structural integration, the central government maintains direct control over the delivery process and ensures the quality, uniform execution and effective monitoring of the screening programmes based on predefined indicators.

In Italy, a national-level decree issued by the Ministry of Health, adopted by the State-Regions Conference and aligning with European Parliament resolutions and European Society of Breast Cancer Specialists (EUSOMA) guidelines, established and mandated a standard threshold for surgical interventions in Breast Units, marking a milestone in a still ongoing process of resource and expertise concentration, which was initiated through an interpersonal and functional integration of diagnosis and treatment phases under one framework [29].

3.1.2. Functional integration

All three countries demonstrate functional integration across ECC steps. Denmark has established a consensus-building system for governing and monitoring all phases of the cancer pathway, from detection to rehabilitation and palliative care. This initiative is led by the Danish

Health Authority and includes regional healthcare providers as well as the Danish Multidisciplinary Cancer Groups, which incorporate insights from clinicians, epidemiologists, nurses, pharmacists, social workers and patient associations. This approach aligns with ongoing updates to protocols and guidelines, ensuring that clinicians and healthcare professionals continually enhance their practice in response to evolving needs. This strategy is reflected in the management of steps such as screening through the National Steering Groups for Cancer Screenings, which comprise all relevant parties involved in managing the national programmes.

In the Netherlands, in addition to the structural integration described above, the early detection step is functionally integrated under a formal policy framework that defines roles, responsibilities and relationships among parties involved in decision-making and the implementation of the national cancer screening programmes; it specifies accountability, quality assurance, monitoring and evaluation mechanisms [30]. This approach facilitates the alignment of all elements of the care chain. In particular, the smooth transition from screening to further diagnostics and treatment occurs via referral from general practitioners, which is also part of the screening process.

In Italy, the Ministry of Health sets evidence-based screening guidelines, implemented by regions according to national standards. The National Centre for Screening Monitoring coordinates efforts between the Ministry, regional authorities and the National Institute of Health to support and oversee regional cancer screening programmes through working groups, benchmarking and voluntary audits to promote continuous improvement (relevant Italian policy and technical documents concerning national guidelines, screening recommendations and regional implementation arrangements are reported in Supplementary Table S1).

3.1.3. Interpersonal integration

Interpersonal integration encompasses relationships among stakeholders and between healthcare providers, patients and their families. This approach to integration is applied, for instance, in health literacy interventions involving a wide range of stakeholders to raise awareness and spread information about cancer. In Denmark, the government-established Danish Health Literacy Network embraces health professionals, researchers and policymakers working in all health literacy areas. In the Netherlands, health literacy initiatives are led and coordinated by non-governmental stakeholders [31]. The Health Literacy Alliance exemplifies the professional integration across health and social sectors, where collaboration aims to raise awareness of the country's limited health literacy. The Alliance provides a platform for stakeholders to exchange knowledge, experience and tools for mutual learning while incorporating patients' perspectives in cancer care. The institutionalisation of the interpersonal integration of healthcare professionals, patients and their families differ in Denmark and the Netherlands, and it appears to be only partially institutionalised in Italy; Denmark emphasises informed patients and tailored care meetings, whereas the Netherlands focuses on shared decision-making to enhance patient engagement and compliance. At the service level, multidisciplinary teams are widely utilised in all three countries, yet challenges remain in connecting primary and secondary care.

3.1.4. Process integration

Process integration is most apparent in managing cancer patient pathways. Denmark has introduced three distinct cancer patient pathways for early detection, diagnosis and eventually early treatment in hospitals: one for organ-specific screening programmes, another for diagnoses made by General Practitioners involving serious non-specific symptoms and a third for unspecific symptoms [32]. These pathways, supported by care navigators, streamline access to diagnostic centres and treatment at regional hospitals.

In the Netherlands, the Oncology Task Force has promoted the formation of Comprehensive Care Networks through bottom-up initiatives since 2014 [33]. The organisation of cancer care in networks takes two forms: tumour-specific ones and regional oncology networks (RONs). RONs provide an organisational framework that enables integrated care, addressing the complexity and high costs associated with cancer care. These networks connect primary, secondary and tertiary care providers via network agreements that follow standards issued by the Oncology Task Force and the Stichting Oncologische Samenwerking (SONCOS;the Oncological Cooperation Foundation), and cover multidisciplinary observations, shared care pathways and protocols, research, and the generation and exchange of quality data. The process is organised at the managerial, professional and facility levels by establishing a board, coordinator(s) and tumour-specific working groups, respectively.

In Italy, the Ministry of Health and the regions have collaborated to establish RONs, leaving to regions the identification of context-specific arrangements. Some regions (e.g. Piedmont, Emilia-Romagna, Tuscany and Campania) have already fully implemented their own RONs following a hub-and-spoke arrangement or comprehensive cancer care networks under national monitoring. (relevant Italian policy and technical documents supporting this reform are reported in Supplementary Table S1).

3.2. Integration strategies across early cancer care phases

Tables 1, 2 and 3 map the integration strategies implemented for governing and managing ECC phases in each country according to the integration dimensions (structural, functional, interpersonal, process).

Finally, the perspective of each country's experience provides valuable insights into how specific contexts shape the integration strategies and tools implemented. These examples highlight the importance of ensuring integration early in the cancer care pathway through the consistent, extensive application of the aforementioned dimensions of integration. Denmark exemplifies the power of an ongoing commitment to the development and revision of cancer-related policies based on a quality-assurance system [22]. This approach is rooted in the extensive use of stakeholder engagement under the governance of the Danish Health Authority and entails the comprehensive use of a range of integration strategies (Table 1). The Netherlands balances a fragmented healthcare system through structural integration for population-based interventions (e.g. screening) and by leveraging clinicians' demands for process integration with top-down coordination of stakeholders (Table 2). Italy, characterised by a highly decentralised healthcare system at the regional level, relies on regional governance capacities that vary across its Regional Healthcare Services. Consequently, although mandated regional oncology networks represent a significant outcome of the long-standing interplay between bottom-up initiatives and top-down decision-making, their implementation remains uneven across Italian regions. In this context, integration strategies frequently concentrate on interpersonal integration (Table 3).

4. Discussion

The existing literature on cancer care primarily examines coordination either among professionals [34], or across institutions [35], with most studies focusing on contiguous phases, such as treatment and palliative care [36], rather than on integration across the entire cancer care continuum [8]. Recent cancer-specific frameworks have advanced our understanding of early diagnosis programmes and integrated supportive care [6;7]. In parallel, the development of clinical pathways [37, 38] and comprehensive cancer care networks with multidisciplinary teams [39] reflects a growing recognition of the need to move beyond stand-alone coordination to address the fragmentation experienced by cancer patients who 'fall through the gaps' [40,41]. However, the organisational and inter-organisational mechanisms through which the different phases of ECC are connected across health systems remain underexplored.

This study employed a multilevel conceptual model to analyse the

Table 1
Mapping of integration initiatives in Denmark across strategies, by different integration dimensions, and phases of the early cancer care pathway.

Strategies by integration dimension		Early cancer care phases				
		Education/ health literacy	***Early detection***		***Early diagnosis***	***Early treatment***
			Screening	Symptoms		
	Structural	No initiatives tracked for this phase/ dimension.	No initiatives tracked for this phase/ dimension.	No initiatives tracked for this phase/dimension.	Centralisation of oncology diagnostic services and Regions' Clinical Quality Development Programme.	
	Functional	No initiatives tracked for this phase/ dimension.	National Steering Groups for Cancer Screenings managing the national screening programmes	Danish Multidisciplinary Cancer Groups (DMCGs) coordinate collaboration among medical specialties and other professionals in cancer care, develop national clinical guidelines GLs and improve cancer care quality through data analysis and feedback.		
			Danish Comprehensive Cancer Centre (DCCC) is a binding collaboration established by the government, public hospital owners, clinical cancer departments, universities and the Danish Cancer Society to improve and standardise the quality of cancer treatments.			
	Interpersonal	Danish Health Literacy Network established by the Danish Health Authority to promote cross-sector networking	Agreements and consultancy between municipalities' social services and hospitals managing cancer screening programmes	Dedicated interdisciplinary diagnostic centres	Informed patient whose personal needs are addressed by healthcare professionals	
	Process	No initiatives tracked for this phase/ dimension.	No initiatives tracked for this phase/ dimension.	Patient and clinical pathways		

Table 2
Mapping of integration initiatives in The Netherlands across strategies, by different integration dimensions, and phases of the early cancer care pathway.

Strategies by integration dimension		Early cancer care phases				
		Education/ health literacy	***Early detection***		***Early diagnosis***	***Early treatment***
			Screening	*Symptoms*		
	Structural	No initiatives tracked for this phase/dimension	Cancer screening process integrated vertically and horizontally in a structural way		No initiatives tracked for this phase/ dimension	No initiatives tracked for this phase/ dimension
	Functional	No initiatives tracked for this phase/dimension	A policy framework formally establishing legal and governance conditions for national population screening programmes			No initiatives tracked for this phase/ dimension
	Interpersonal	Self-governed Health Literacy Alliance with over 150 members exemplifies professional integration across health and social sectors	No initiatives tracked for this phase/ dimension	Shared decision-making process between patient and clinician		
	Process	No initiatives tracked for this phase/dimension.	No initiatives tracked for this phase/ dimension.	Comprehensive cancer care networks: bottom-up and top-down support of oncology network creation following Oncology Task Force and SONCOS standards		

Table 3
Mapping of integration initiatives in Italy across strategies, different integration dimensions, and phases of the early cancer care pathway.

Strategies by integration dimension		Early cancer care phases				
		Education/ health literacy	***Early detection***		***Early diagnosis***	***Early treatment***
			Screening	*Symptoms*		
	Structural	No initiatives tracked for this phase/ dimension.	Breast Cancer Units implementing European Society of Breast Cancer Specialists (EUSOMA) standards			
	Functional	No initiatives tracked for this phase/ dimension	National Screening Observatory (Ministry of Health, ISS, regional deputed bodies, clinicians' groups)	No initiatives tracked for this phase/dimension	The Ministry of Health issues evidence-based standards and guidelines to be implemented by the Regional Healthcare Services.	
	Interpersonal	Patchy and localised collaborations among stakeholders (NGOs and regional and/or local prevention units)	Patchy and localised collaborations among stakeholders	No initiatives tracked for this phase/dimension	Pilots of local oncological networks	
	Process	No initiatives tracked for this phase/ dimension	No initiatives tracked for this phase/ dimension	Regional Oncological Networks (RON)		

policies and strategies adopted for ECC in three countries and its integration into a single pathway. This framing emphasises that integration is a dynamic, long-term, multifaceted process unfolding through interconnected phases rather than a one-time effort culminating in a static state. In this view, we clarify for instance: (i) hard (structural and functional) and soft (normative and interpersonal) dimensions of integration, emphasising their interdependence; and (ii) positioning coordination process (e.g., shared information, protocols, and procedures) as an important outcome that may nevertheless represent only an initial step toward deeper integration across actors, shaping not only what is done, but also how interventions are implemented. Overall, the framework enhances scholars' and policymakers' analytical capacity by providing an approach and a comprehensive set of concepts—widely tested in chronic disease pathways—that can be readily transferred to the complex context of early cancer care.

The analysis allows us to highlight how the different dimensions of integration are relevant to differing extents in the various steps of ECC and to identify the relationships among them.

Our findings first reveal how structural integration centralises key infrastructures, such as information systems and registries, and enables

spanning multiple steps of ECC, in this way supporting integrated ECC pathways. Interpersonal integration creates a strong foundation for effective education initiatives regarding cancer. Denmark, for instance, excels in promoting a health literacy environment through the Danish Health Literacy Network, whereas the Netherlands has advanced shared decision-making practices via ministerial leadership and collaboration between professionals and patient associations [42]. Moreover, interpersonal integration favours the governance and management of steps in ECC featured by highly diverse actors (e.g. NGOs, municipalities and healthcare providers).

Second, our findings suggest that integration dimensions can complement one another. For instance, interpersonal relationships can facilitate functional or process integration. A case in point is Italy's nearly 200 Breast Units, which emerged from interpersonal collaboration and functional coordination and successfully addressed long-standing issues of fragmentation in service delivery, initiating a structural process of concentration. Likewise, process integration can foster functional integration. The Dutch approach to ensure accessible and affordable oncological care via networks has evolved into a standardised framework under the 2022 Integraal ZorgAkkoord (IZA; Integrated Care Agreement).

However, our study did not capture sufficient evidence of normative integration. As Singer et al. [10NEW] note, this dimension of integration is grounded on the shared experiences and culture of groups of individuals. Because our analysis was based mainly on policy documents, institutional reports and key informant interviews, it was better suited to identifying formal organisational arrangements, governance mechanisms, stakeholder relationships and care processes than assessing shared values, culture or collective identity among professionals and organisations. We therefore did not retain normative integration as a separate empirical category in the final ECC mapping. Future research using staff surveys, ethnographic methods or organisational culture instruments could examine whether, and how, normative integration supports or constrains ECC integration.

Such insights are important because an analysis focused predominantly on formal arrangements may overlook how shared professional norms, trust and common understandings among actors and across the ECC pathway can support, or hinder, the development of functional and process integration. For example, shared professional norms between diagnostic and treatment teams may facilitate the formalisation of referral protocols, multidisciplinary meetings or shared care pathways.

Third, the experience of the three countries indicates that there is no one-size-fits-all strategy for implementing integrated healthcare. The effects and the relative weight of different enabling levers and contextual constraints are strongly country-specific, and their interplay can generate a wide range of pathways toward successful integration. Accordingly, we argue that policymakers and managers should be provided with a portfolio of tools and strategies that can be adapted and tailored to local conditions. At the same time, these experiences suggest that overarching goals for ECC integration include improving timeliness, ensuring continuity of care, and involving key actors comprehensively. In Box 1, we provide key recommendations on potential tools and strategies - grounded in the integration dimensions identified in the three country cases - that may support policymakers in strengthening ECC integration through context-specific adaptation. Each recommendation is derived from practices observed in one or more of the three country cases and is tagged accordingly. Their feasibility is therefore context-dependent: we expect their relative priority as well as specific tools used to vary according to each country's governance arrangements, available resources and starting level of integration.

Box 1
Key recommendations on how integration in ECC could be achieved.

1st Recommendation: Interpersonal integration dimension (Source: Denmark)
- Invest in and coordinate key actors' involvement by adopting a comprehensive approach to ECC.
- Establish physical and/or virtual spaces, and formal and/or informal mechanisms where key actors can connect through. Examples include cross-sectoral coordinating bodies with liaison roles, underpinned by cancer control plans, common action plans, and shared decision-making processes. Ensure that actors recognise their specific and unique role within a unified process from health literacy and education to early treatment.

2nd Recommendation: Interpersonal integration dimension (source: Denmark and the Netherlands)
- Identify effective ways to involve and support citizens, patients and their families by, for instance, investing in tailor-made health literacy interventions, or in developing provider-patient shared decision-making processes.

3rd Recommendation: Structural, functional and interpersonal integration dimensions (Source: Denmark and the Netherlands; contrasted with Italy)
- Ensure continuity of care by identifying the right balance between decentralisation/centralisation and integration approach in line with institutional arrangements, geographical features and existing service capacity.
- Comprehensive Cancer Care Networks (CCCNs) can represent a key instrument to achieve this goal when they combine pathways, care navigators, centralisation of cross-cutting services, multiprofessional and multidisciplinary teams and virtual platforms for sharing guidelines, standards, procedures, and evidence-based service models.
- Prepare for and address challenges in the implementation of an integrated ECC pathway, including poor coordination between secondary and primary care, limited capacity to manage change and the need to foster a multidisciplinary or multiprofessional culture.

4th Recommendation: Interpersonal and functional integration dimensions (Source: Denmark)
- Boost timeliness in early detection by involving the entire healthcare system. Possible solutions include training and updating healthcare professionals on cancer symptoms and possible suspicion establishing referral procedures between primary and secondary care and developing a single-access point to the diagnostic and treatment pathway. Address key challenges such as the optimisation of stakeholder connections and the creation of systematic touchpoints and communication channels.

5th Recommendation: Functional and structural integration dimensions (Source: Denmark)
- Plan and implement change management processes and tools, including the use of information system and KPIs to support a quality assurance system.
- Address implementation challenges such as training for civil servants, healthcare managers, and clinicians to populate and use quality and monitoring systems.

4.1. Study limitations and future research directions

The study is not free of limitations. First, our assessment of integration was qualitative, in line with the exploratory nature of the study. Other methodological approaches based on surveys, including Patient Reported Experience Measures (PREMs), could be valuable for assessing integration from the perspective of both professionals and cancer patients. Second, our study assessed integration but not its outcomes in the three country cases. Despite encouraging attempts coming from oncology networks, the measurement of the outcomes of integrated cancer care is still not well established. More work must be done to connect integration strategies to outcomes in terms of quality of care, health outcomes, equity and efficiency. Third, our analysis covered a relatively short span of time compared to the complex and lengthy process of ECC integration. Longitudinal studies will be essential to capture the ongoing evolution in integrating ECC phases and the likely outcomes of those integration processes. Finally, our analysis covers a limited set of countries that implemented integration-based strategies for ECC, characterised by different types of healthcare systems and contextual macro-barriers to integration. Nevertheless, such approach can be extended to other countries where similar interventions have been introduced, and data and information are available and accessible to allow for an in-depth analysis.

Despite these limitations, the paper provides insights on how the increasing complexity of ECC can be reasonably governed. The growing number of stakeholders, care settings and professionals involved in ECC has prompted policymakers and managers to adopt various integration strategies as witnessed by the cases of Denmark, the Netherlands and Italy. However, a cross-stakeholder shared vision of integration remains a critical gap. Addressing this could drive further improvements in ECC delivery.

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CRediT authorship contribution statement

Amelia Compagni: Writing – review & editing, Formal analysis, Conceptualization. **Natalia Oprea:** Writing – original draft, Investigation, Formal analysis, Conceptualization. **CAVAZZA MARIANNA:** Writing – original draft, Investigation, Formal analysis, Conceptualization.

Declaration of Competing Interest

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Appendix A. Supporting information

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