Mapping the Landscape of Oncology Networks: A Systematic Literature Review

Le reti oncologiche nel sistema sanitario contemporaneo: una mappatura sistematica della letteratura

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Progettate per colmare le discontinuità generate da una presa in carico frammentata, le reti rappresentano un'infrastruttura strategica nei sistemi sanitari contemporanei, promuovendo la collaborazione tra una pluralità di attori e istituzioni. In particolare, le reti oncologiche si configurano oggi come strumenti cruciali per affrontare la crescente complessità dell'assistenza ai pazienti oncologici, grazie alla loro capacità di offrire soluzioni integrate e coordinate.
Nonostante la loro rilevanza, la comprensione dei fattori determinanti che incidono sulla funzionalità, sull'efficacia e sulla sostenibilità di tali reti rimane una sfida aperta e in continua evoluzione. Questo contributo intende colmare tale lacuna, analizzando i principali driver che influenzano il ciclo di vita delle reti oncologiche, con particolare attenzione ai fattori che ne supportano l'istituzione, il consolidamento e la durata nel tempo.
Attraverso una revisione sistematica della letteratura, l'articolo individua le leve principali che sostengono la performance delle reti oncologiche e approfondisce il modo in cui tali leve ne modellano le traiettorie evolutive. I risultati contribuiscono ad arricchire la comprensione teorica delle reti come sistemi dinamici e adattivi, proponendo un framework concettuale utile all'analisi e alla progettazione di interventi.
L'articolo offre, infine, spunti operativi per i decisori pubblici, orientati a promuovere approcci più integrati, efficaci e centrati sul paziente, e individua possibili direzioni di sviluppo per future linee di ricerca.

Designed to bridge the gaps created by fragmented care, networks represent the backbone of the healthcare system by promoting collaboration across multiple healthcare providers and institutions. Oncology networks have become a vital component of modern healthcare systems by offering integrated solutions to the growing complexity of cancer care.
However, understanding the key drivers able to influence the functionality, effectiveness and sustainability of oncology networks remains a complex and evolving challenge. Therefore, this

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article aims to fill this gap by analyzing the core drivers that shape the lifecycle of oncology networks with a specific focus on identifying the factors that support their establishment, success, and long-term effectiveness. Through a systematic literature review (SLR), this article identifies the main drivers supporting oncology networks and it explores how these drivers influence their performance. The results of SLR contribute to the theoretical understanding of oncology networks as dynamic and adaptive systems, by offering a theoretical framework. More specifically, the article lays the groundwork for a more integrated, effective, and patient-centered approach to cancer care, and it offers practical insights for policymakers to better address the complexities of cancer treatment. Ultimately, the article outlines prospective avenues for future research.

Conçus pour combler les lacunes engendrées par une prise en charge fragmentée, les réseaux représentent l'ossature du système de santé, en favorisant la collaboration entre différents prestataires et institutions. Les réseaux oncologiques sont devenus un pilier essentiel des systèmes de santé contemporains, en apportant des solutions intégrées face à la complexité croissante des soins contre le cancer.

Cependant, comprendre les principaux leviers qui influencent le fonctionnement, l'efficacité et la durabilité de ces réseaux demeure un défi complexe et en constante évolution. Cet article vise à combler cette lacune en analysant les facteurs déterminants qui façonnent le cycle de vie des réseaux oncologiques, avec une attention particulière portée à ceux qui favorisent leur création, leur succès et leur pérennité.

À travers une revue systématique de la littérature, l'article identifie les principaux leviers qui soutiennent les réseaux oncologiques et examine leur impact sur la performance de ces derniers. Les résultats de la RSL contribuent à enrichir la compréhension théorique des réseaux oncologiques en tant que systèmes dynamiques et adaptatifs, en proposant un cadre conceptuel structuré.

Plus précisément, l'article jette les bases d'une approche plus intégrée, efficace et centrée sur le patient en matière de prise en charge du cancer, tout en offrant des pistes concrètes aux décideurs publics pour mieux faire face aux défis liés aux traitements oncologiques. Enfin, il ouvre des perspectives prometteuses pour les recherches futures.

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1. Introduction

In recent years, oncology networks have increasingly emerged as an organizational response to the growing complexity of cancer care and the evolving needs of patients (Ferlie et al., 2013). The increasing complexity of cancer care and the persistent rise in oncological incidence and prevalence have contributed to the growing adoption of oncology networks as organizational models. In 2022, an estimated 436,000 new cancer cases were reported in Italy alone (OECD, 2023; IARC, 2023). At the global level, approximately 20 million new cases and 9.7 million cancer-related deaths were registered (Sung et al., 2024; IARC, 2023[1]). Projections indicate that the global cancer burden may exceed 35 million new

1 International Agency for Research on Cancer (IARC). (2023). *GLOBOCAN 2022 – Italy Fact Sheet*. World Health Organization. Retrieved from: https://gco.iarc.who.int/media/globocan/factsheets/populations/380-italy-fact-sheet.pdf

cases per year by 2050, driven by demographic shifts and increased exposure to modifiable risk factors (WHO, 2024). In this context, networks have been promoted to enhance coordination among healthcare providers, improve continuity of care (Haines et al., 2012; Nair et al., 2018), and ensure more equitable access to specialized services, thereby contributing to the overall effectiveness and efficiency of healthcare systems (Tremblay et al., 2016).

Despite the widespread adoption of oncology networks, the literature lacks a widely accepted definition of what constitutes an oncology network—particularly regarding the drivers that should be leveraged to improve performance or overcome organizational challenges. Existing contributions tend to focus on different aspects, such as administrative and managerial structures (Tremblay et al., 2016; Fuso et al., 2011); clinical dimensions, including the organization of care pathways and service integration (Partridge et al., 2005; Semprini, 2024), and relational and behavioral dynamics within networks, such as trust and inter-organizational collaboration (Evans et al., 2024; Crespel et al., 2008).

The literature on oncology networks is rich but fragmented, and it lacks a unified analytical perspective, especially addressing the topic of their performance. This gap makes it difficult to capture how different variables – relating to structure, management, context or relationships – of the networks interact to influence their functioning and outcomes. Addressing this limitation, the present study adopts the Dynamic Multidimensional Model of Network Performance (Cepiku, 2014) as a guiding framework to systematically map and interpret the literature and the drivers that contribute to oncology networks' performance. To achieve this, the study addresses the following research questions: i) How has the literature on oncology networks developed over time, and what are its defining features? ii) What are the main determinants that influence the performance of oncology networks?

2. Theoretical background

Collaborative governance has emerged as a key paradigm in public administration to address complex and cross-sectoral challenges that cannot be solved by single actors operating in isolation (Ansell & Gash, 2008; Emerson et al., 2012). This approach emphasizes the coordination of multiple stakeholders, public, private and civic, through formal and informal mechanisms of negotiation, trust-building, and shared decision-making. It is particularly relevant within service systems characterized by fragmentation, interdependence, and uncertainty, where traditional hierarchical models have shown their limits (Keast et al., 2014; Agranoff & McGuire, 2003). Within this broader perspective, network governance is one of the most institutionalized and analytically mature expressions of collaborative governance (Rhodes, 1996; Kickert et al., 1997; Provan & Kenis, 2008; Krogh, 2022). Networks bring together autonomous but

interdependent actors, who coordinate through reciprocity, negotiation and shared objectives rather than centralized authority (Agranoff & McGuire, 2003; Kooiman, 2004). The network model is particularly suited for addressing *wicked problems*-policy challenges that transcend organizational and sectoral boundaries and require integrated, adaptive responses (Rittel & Webber, 1973). From a public management perspective, network governance has been used to interpret the transformation of the public sector in the face of rising interdependence, policy complexity and the reconfiguration of boundaries between the state, the market and civil society (Cepiku, 2017). In this view, networks are not simply coordination tools but constitute a distinct governance mode based on distributed authority, negotiated order and shared accountability (Kooiman, 2004).

Overall, networks have been widely applied in the healthcare sector, because of the fragmentation of services, rising complexity of care and territorial disparities (Provan & Milward, 2001; Ferlie et al., 2013). Networks have been promoted as instruments to improve service integration, enhance care continuity, and facilitate collaboration among hospitals, primary care providers, health agencies and patients (Goodwin et al., 2004). Within the healthcare sector where networks have been applied, oncology networks stand out as a paradigmatic case. They have emerged not only as an organizational response to the complexity of cancer care but also as a strategic answer to the growing epidemiological burden of cancer. According to the WHO, cancer was responsible for nearly 10 million deaths worldwide in 2020, accounting for one in six deaths globally. The number of new cancer cases is projected to rise from 19.3 million in 2020 to over 28 million by 2040, due to ageing populations and changes in risk factors (WHO, 2021; IARC[2], 2021). This dramatic increase has intensified the need for systems capable of coordinating care across institutions, levels, and territories.

In several countries, oncology networks have been established as strategic policy instruments aimed at reorganizing cancer care across fragmented systems, with the goal of enhancing continuity, promoting equity and fostering innovation in service delivery (Calman & Hine, 1995; Taplin et al., 2010; Meda et al., 2023; Braveman et al., 2003). These networks bring together clinical, managerial and institutional actors to reduce unwarranted variations in treatment, promote integrated pathways and align service delivery with population health needs (Tremblay et al., 2016; Romiti et al., 2020). Although widely implemented, the literature reveals heterogeneity in how oncology networks are defined and evaluated. Some contributions focus on structural characteristics – such as governance maturity, institutional arrangements, and network configuration (Tremblay et al., 2016); others emphasize behavioral dimensions such

2 The International Agency for Research on Cancer is a specialized agency of the World Health Organization (WHO), established in 1965 to conduct and coordinate research into the causes of cancer and develop scientific strategies for cancer control.

as interprofessional trust, mutual learning, and shared norms (Ferlie et al., 2010). The literature lacks a comprehensive representation of oncology networks, especially concerning the drivers of their performances.

Several network performance models have been developed in the literature to identify different performance levels and the factors able to influence them. Among these different models, the Multidimensional Model of Network Performance (MMNP) (Cepiku 2013) is one of the most used and comprehensive frameworks for assessing network performance,

as it emphasizes the dynamic and systemic nature of public networks, viewing their performance as the outcome of ongoing interactions among multiple, interdependent dimensions. However, the model goes beyond the common division into exogenous and endogenous network performance drivers such as institutional context, policy environment, leadership, and resource availability. MMNP, in fact, distinguishes factors that can and cannot be either directly or indirectly influenced by the management of the network. As such, some factors are entirely outside managerial control, but others, referred to as internal and external resources, can be partially shaped by management actions, though often only after the network begins to generate results. Furthermore, according to the model, the institutional design of a network is not inherently an exogenous factor; it is only considered exogenous when externally imposed, such as in legally mandated networks.

Overall, despite its application in the healthcare sector (the Tigray anti-malaria network), the MMNP lacks a specific application to oncological networks which are characterized by unique features and challenges. Therefore, building on the MMNP framework, this article aims to fill this gap by conducting a systematic literature review to identify the main performance drivers of oncological networks. These drivers can subsequently serve as a theoretical basis for empirical testing and model validation in future research.

3. Methodological approach

A systematic literature review (SLR) was conducted to explore oncology networks, with a specific focus on their characteristics and the key factors that drive and influence their performance.

The review process followed the PRISMA guidelines (Page et al., 2021), ensuring transparency and reproducibility across all stages of study identification, screening, eligibility assessment and inclusion (Figure 1).

A comprehensive literature search was conducted in the Web of Science Core Collection database. The search strategy employed a Boolean query designed to capture relevant studies at the intersection of oncology networks and performance-related constructs. The search string follows:

TS=(("oncolog network*" OR "cancer network*" OR "healthcare network*") AND (outcome* OR performanc* OR result* OR determinant*)).*

The selected keywords were looked for in the title, abstract and keywords.

"*Performance*", "*outcome*", and "*result*", while differing in terminology, all refer to what a network is able to produce, more specifically, results, effects and impacts.

"Performance" represents a more systemic and structured dimension, which becomes tangible through *outcomes* and *results* as empirical and observable manifestations. The inclusion of "*determinant*" was intended to capture studies focusing on factors influencing these results. The combination of these terms does not indicate conceptual heterogeneity; rather, it reflects a coherent semantic structure consistent with the adopted analytical framework, the Dynamic Multidimensional Network Performance Model (Cepiku, 2013), and with the objective of examining both performance and its determinants from a multidimensional perspective.

To refine the scope of the search, specific Web of Science (WoS) Categories were applied: Health Policy & Services, Public Administration, Management, Public, Environmental & Occupational Health. The *Business* category was excluded because the focus of the study is on oncology networks as instruments of public governance within healthcare systems.

While the Business category may contain relevant managerial insights, it predominantly covers private-sector settings, which are less aligned with our research questions and theoretical framing in the public and non-profit domains.

Inclusion and exclusion criteria

Studies were eligible if they examined oncology networks or organized cancer care systems from a systemic, organizational, managerial or governance perspective, with explicit attention to the determinants of their performance. Both conceptual and empirical contributions were considered. On the other hand, studies were excluded if they: mentioned networks only incidentally, without treating them as the main object of analysis; focused exclusively on clinical, biomedical or biomolecular aspects (e.g., therapeutic protocols, disease progression, pharmacological trials); omitted any analysis of performance determinants or of the structure and functioning of the network. The same criteria were applied consistently during both the abstract screening and the full-text review.

Screening process

The initial search yielded a total of 316 records, which formed the dataset for the screening phase. Titles and abstracts were reviewed independently by two researchers to minimize bias, applying the eligibility criteria described above. Articles that met these criteria at the abstract stage proceeded to full-text assessment. After this step, 66 articles fulfilled all inclusion criteria and were retained for the final synthesis and in-depth analysis.

Analytical approach

The analysis was conducted in two phases, combining quantitative and qualitative elements. First, descriptive statistical analysis was performed to map the geographical focus, publication timeline, and methodological design of the studies. Second, a qualitative thematic analysis identified the main analytical contents and arguments. Studies were coded systematically and grouped into recurring themes, guided by the Dynamic Multidimensional Network Performance Model (Cepiku, 2013).

Although originally developed for assessing performance in public sector networks, the model is well-suited to the oncology context as it captures both structural and relational dimensions of inter-organizational collaboration, key features in the governance of complex, multi-actor care systems. Its multidimensional design enables the integration of diverse factors, from external constraints to internal dynamics, that collectively influence how networks operate and deliver value.

A qualitative content analysis was performed to identify the main drivers that the reviewed studies associate with the performance of oncology networks. We adopted the Dynamic Multidimensional Network Performance Model (Cepiku, 2013) as the main analytical lens, using its dimensions as a starting point for coding the literature. While the model guided the coding, the approach remained open to emerging insights beyond its original dimensions, allowing for the identification of interrelated domains influencing network performance and outcomes. Although originally developed to assess performance in public sector networks more broadly, this model is well-suited to the oncology context due to its capacity to account for both structural and relational dimensions of inter-organizational collaboration, which are essential to the governance of complex, multi-actor care systems. The model's multidimensional approach allows for the integration of diverse factors—ranging from external constraints to internal dynamics—that collectively influence how networks operate and deliver value.

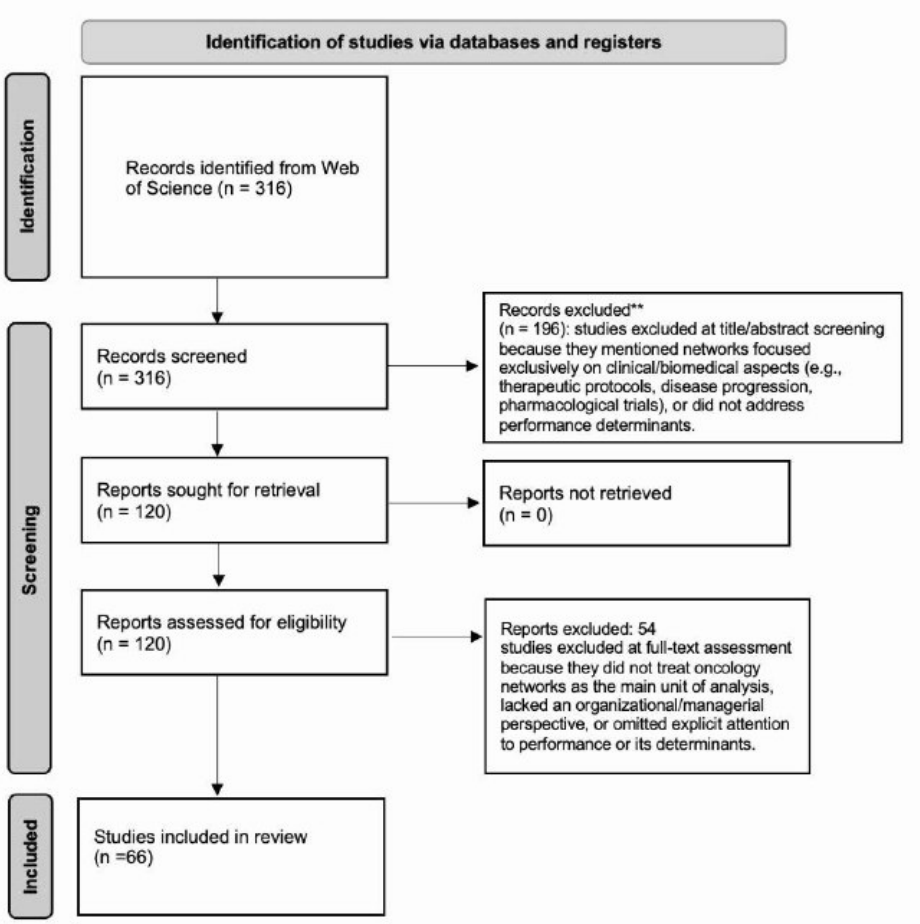
The coding process was open and iterative, allowing for the emergence of drivers of the oncology network. When new drivers appeared consistently across multiple studies, they were integrated into the framework, thereby enriching the original dimensions with additional, evidence-based elements.

This approach enabled us to preserve the multidimensional and systemic perspective of the Dynamic Multidimensional Network Performance Model, while extending its explanatory power to better reflect the specificities of oncology networks. The result is an adapted and expanded version of the model that incorporates both theoretically grounded categories and empirically derived drivers, offering a more comprehensive understanding of what shapes network performance in this context.

As part of the descriptive analysis, we also examined the journals in which the included studies were published.

The most frequent journals were *Journal of Health Organization and Management*, *BMC Health Services Research*, *Value in Health*, and *Mecosan*, which together accounted for a significant share of the final sample.

Figure 1 – Flowchart of the PRISMA model



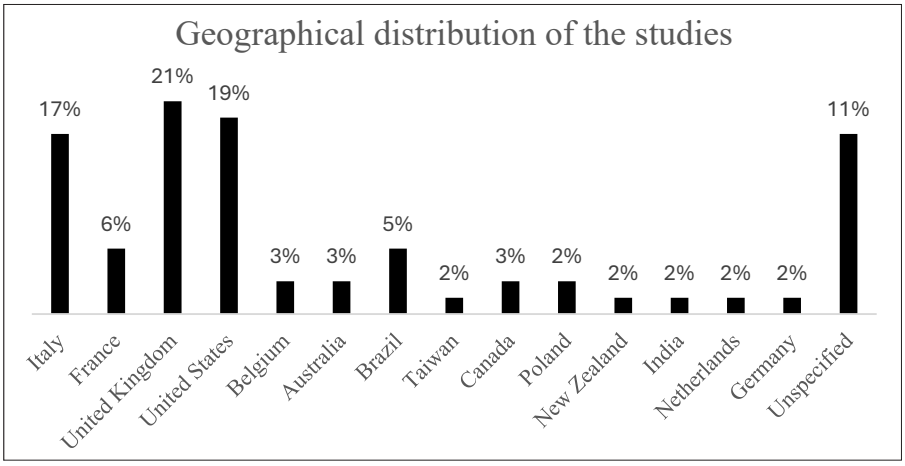
4. Results

From the final dataset of 66 articles, the geographical distribution of studies has been analyzed based on the contexts investigated in the empirical articles. The analysis revealed that the most recurrent theoretical lenses applied in the selected literature are those of *collaborative governance* (Rhodes, 1996; Kickert et al., 1997; Provan & Kenis, 2008, Provan & Milward, 1995) and *network governance* (Ansell & Gash, 2008; Keast, 2022; Sørensen, 2002).

The reviewed studies show a heterogeneous geographical pattern. A considerable number of contributions originate from European countries, particularly Italy and France, where oncology networks have been formal-

ly integrated into regional health systems and are often linked to national-level planning efforts (Nair et al., 2018). In the United Kingdom, several studies analyse networks operating within regionally organized models of cancer care, often framed as Managed Clinical Networks (MCNs). Other European contexts, including those involved in accreditation processes such as the Organization of European Cancer Institutes (OECI[3]), are also represented. Outside Europe, the United States accounts for a substantial share of publications, with research frequently addressing inequalities in cancer outcomes in specific populations and territories (Partridge et al., 2005; Thienprayoon et al., 2022; Taplin et al., 2010; Addicott et al., 2007). Publications from other geographical areas, including Canada, Australia, and selected countries in Asia and South America, are less frequent.

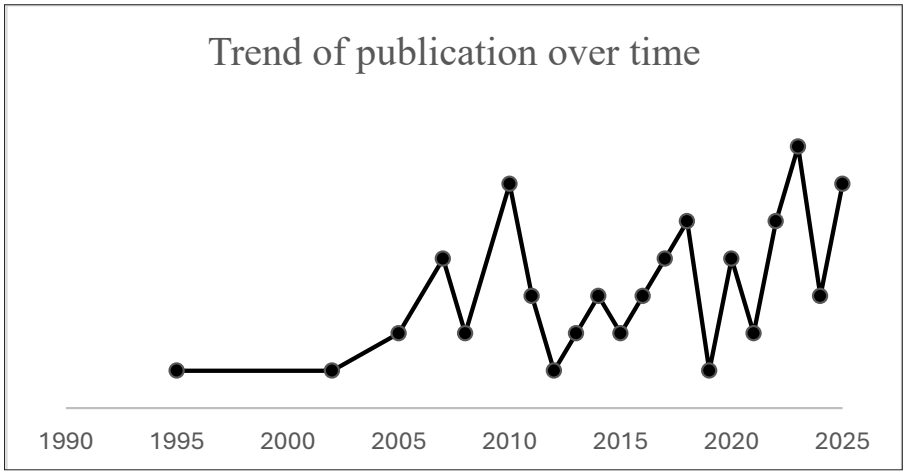
Figure 2 – Geographical distribution of analyzed oncology networks



As for the distribution of studies over time, scholarly interest in oncology networks has intensified in distinct historical phases, often in response to health system reforms or broader policy shifts, as shown in Figure 3.

3 The Organization of European Cancer Institutes (OECI) is a non-governmental, non-profit organization established in Vienna in 1979 and restructured in 2005 as a European Economic Interest Grouping (EEIG). Headquartered in Brussels, OECI brings together over 170 cancer centers across Europe and beyond, fostering a collaborative network dedicated to improving cancer training, research and care (Source: OECI Official Website).

Figure 3 – Temporal distribution over time

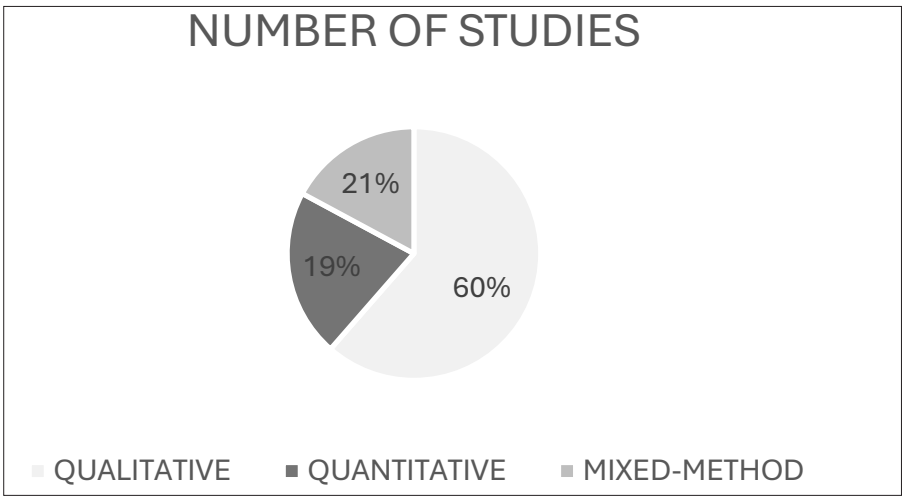


As shown in Figure 3, publication activity starts in the mid-1990s, increases from the mid-2000s, reaches a first peak around 2010, and then fluctuates with further waves of interest. A renewed upswing is visible from 2018 onwards, with a local peak around 2023. This growth corresponds to the progressive institutionalization of regional cancer networks and the formal adoption of cancer control strategies at both national and international levels. In the United Kingdom, a key antecedent to this trend was the Calman-Hine Report (1995), which laid the groundwork for regionally organized models of cancer care. Although it preceded the publication surge, its emphasis on multidisciplinary collaboration and equitable access provided a conceptual and policy framework that paved the way for the implementation of Managed Clinical Networks (MCNs). At the European level, the launch of the European Partnership for Action Against Cancer (EPAAC) in 2009 represented a turning point. Between 2008 and 2015, this momentum was reflected in multiple studies focusing on regionalization, OECI accreditation, and equity issues (Ancarani et al., 2015; Cecilio et al., 2012; Morton et al., 2011; Fuso et al., 2011). Meanwhile, the impact of the 2008 global financial crisis shaped both the rationale for and the study of oncology networks. From the mid-2010s onwards, the European Union played an increasingly central role in shaping both policy and research agendas on oncology networks. The recent peak in publications observed in 2023 appears closely linked to the post-COVID-19 restructuring of healthcare systems. The pandemic revealed structural vulnerabilities in oncology services—particularly in terms of continuity, coordination and territorial equity – highlighting the role of oncology networks in enhancing system resilience (Schiavone et al., 2024; Thienprayoon et al., 2022; Thebaud et al., 2021).

The reviewed studies reflect the multidimensional nature of oncology networks, adopting diverse methodological approaches. As shown in Fig-

ure 4, qualitative methods are the most common, while mixed and quantitative designs appear less frequently in comparison.

Figure 4 – Methodological approach



The prevalence of qualitative research aligns with the early developmental stage of many oncology networks and the need to explore contextual, institutional and relational dynamics that are not easily quantifiable. Case studies, interviews, and document analysis have proven particularly effective in capturing processes such as network formation, stakeholder engagement, and governance evolution (McInnes et al., 2015; Ferlie et al., 2010; Cerisoli et al., 2022; Cecilio et al., 2012; Schiavone et al., 2024). Mixed-methods designs are more common in mature systems, where networks have been formalized or integrated into national policies. These studies combine performance indicators with qualitative insights to assess both outcomes and underlying governance mechanisms (Wilkinson et al., 2007; Brown et al., 2016; Semprini et al., 2024; Ancarani et al., 2015). Quantitative studies remain scarce, largely due to challenges in isolating the effects of network structures within complex health systems and the absence of standardized datasets. When present, they typically focus on outcome metrics, benchmarking, or the impact of governance reforms on access and equity (Yan et al., 2024; Fuso et al., 2011).

5. Drivers of Oncology Networks: determinants of their outcome and performance

The identification of the drivers was the result of an inductive process. We conducted an open analysis of the selected articles, extracting recurrent themes and determinants that were explicitly or implicitly linked to the functioning and outcomes of oncology networks. Through iterative clustering and comparison across cases, these elements were progressively

grouped into nine broad dimensions that capture the main factors shaping network performance.

The dynamic multidimensional model was employed as an interpretative framework, allowing us to systematize the findings and to underline how contextual, institutional, organizational and relational factors interact in influencing network outcomes. The nine drivers are presented in detail below.

1. Territorial and Relational Context

The territorial and relational structure of healthcare systems plays a key role in shaping the development and performance of oncology networks. The prevailing nature of inter-organizational relations - whether cooperative or competitive - influences the feasibility of coordinated models. Even in competitive settings, collaboration can emerge when mutual interdependence and complementary strengths are present (Peng, 2009), enabling practices like shared staffing or service integration to mitigate the downsides of competition (van den Broek et al., 2018). Territorial governance, through decentralisation and regional planning, also matters. Institutional frameworks that foster interdependence and meso-level coordination are crucial to reducing fragmentation and promoting integrated service delivery (Simonet, 2010).

2. Multistakeholder Engagement

Effective oncology networks rely on the active participation of a wide array of actors, including clinicians, managers, policy-makers, patients and civil society organizations. Studies emphasize that stakeholder inclusion in design and decision- making fosters legitimacy, responsiveness and shared accountability. Engagement mechanisms include advisory boards, participatory planning and co-produced care pathways (Morton et al.,2011; Cerisoli et al.,2022; Ancarani et al.,2015; Cecilio et al.,2012; Trevatt et al.,2013).

3. Clear Regulatory and Policy Frameworks

A stable legal and policy framework is widely recognised as a key enabler for formalising network structures and clarifying roles, responsibilities, and performance expectations (Simonet et al., 2010; Trembecki et al., 2022; Notz et al., 2016; Doolin et al., 2014; Wind et al., 2021; Young et al., 2020; Trevatt et al., 2013). Conversely, the absence of clear mandates, consistent legal bases, and coherent performance systems can significantly hinder the institutionalisation and functioning of oncology networks - even in contexts where strategic priorities are formally defined (Aalikhani et al., 2025). Reforms aimed at improving efficiency, universal access and care quality have often provided favourable conditions for oncology networks, particularly in high-complexity sectors. When aligned with such reforms and backed by institutional commitment, net-

works tend to display greater resilience, strategic focus, and improved outcomes (Thebaud et al., 2021; Patricio et al., 2020; Simonet et al., 2010; Addicott et al., 2007).

4. Institutional Incentives, Financial Support and Health System Reforms

The performance of oncology networks is strongly influenced by the presence of institutional incentives, adequate funding and alignment with broader health system reforms. Targeted financial support—such as dedicated funding streams or performance-based contracts—enables networks to implement complex interventions, sustain operations, and adapt to emerging needs (Coppola et al., 2025; Cecilio et al., 2012; Schiavone et al., 2024; Morton et al., 2011; Santos et al., 2017; Ueno et al., 2010; Trevatt et al., 2013).

5. Data sharing

Several contributions highlight the importance of tumor registries, integrated information systems and real-time analytics as tools to guide planning, monitor outcomes and enable evidence-based improvements (Thienprayoon et al.,2022; Yan et al.,2024; Santos et al.,2017; Nekhlyudov et al.,2013; Wilkinson et al.,2007; Trembecki et al.,2022; Semprini et al.,2024). The availability of reliable, centralized data helps address local disparities and align network operations with broader quality goals. Also, technological infrastructure—including shared digital records, telemedicine platforms, and interoperable IT systems—supports both clinical and administrative integration (Patricio et al.,2010; Rajamani et al.,2023; de Vasconcelos Silva et al.,2022). Digitalization facilitates continuity of care, data sharing and coordination across dispersed actors (Tremblay et al., 2025).

6. Standardization and Accreditation Mechanisms

Quality assurance systems such as OECI accreditation or the implementation of PDTA (diagnostic-therapeutic pathways) contribute to the internal coherence and external accountability of oncology networks (Ancarani et al.,2015; Prades et al.,2017; Frush et al.,2017; Morando & Tozzi, 2014; Thienprayoon et al.,2022; McCarthy et al.,2007; Cropper et al.,2002). Standardization is shown to facilitate transparency, comparability and process optimization (Gordon et al.,2018).

7. Internal Resources, Shared Values, and Relational Trust

The performance of oncology networks is strongly shaped by internal organizational capacity, shared professional values, and trust-based collaboration. Trust is widely seen as a key condition for sustaining inter-organizational cooperation - especially in decentralized or voluntary networks. It stems not only from prior collaboration and stable employment conditions (Vargas et al., 2016), but also from cultural align-

ment across institutions. Shared clinical culture and professional values foster mutual understanding, reinforce ethical standards, and support consistent decision-making (Brown et al., 2016; McInnes et al., 2015; Sheaff et al., 2010; Fuso et al., 2011). This cultural cohesion facilitates communication, supports the use of shared protocols, and promotes inter-organizational learning. In oncology networks, where collaboration across institutional and professional boundaries is essential, common values enhance trust and act as a unifying force (Brown et al., 2016; McInnes et al., 2015; Sheaff et al., 2010). Trust, in turn, enables coordination and allows networks to function effectively even without formal hierarchical control (Yan et al., 2024; Van den Broek et al., 2018; Ferlie et al., 2010).

Relational trust and shared values are further strengthened by institutional arrangements, leadership structures, and sufficient time for coordination, all of which enhance collective competence and resilience (Meda et al., 2023; Thienprayoon et al., 2022). Together, these internal and cultural resources underpin the robustness, sustainability, and overall performance of network-based cancer care systems.

8. Leadership and Governance Models

Effective leadership and governance are essential to translate shared values and professional cohesion into coordinated action. Clinically credible leaders play a key role in fostering trust, integrating practices and shaping inclusive cultures. Oncology networks often combine hierarchical, relational, and contractual mechanisms to balance coordination with accountability (Doolin et al., 2014; Rajamani et al., 2023; Broccatelli et al., 2025).

Operational coordination typically relies on hub-and-spoke models, clinical directorates, and multidisciplinary teams (MDTs), which require governance structures that are not only administrative but also clinically embedded. Leadership grounded in clinical legitimacy is especially important to gain professional buy-in and ensure effective implementation (Sheaff et al., 2010; Addicott et al., 2007; Morando & Tozzi, 2014; Coppola et al., 2025; Romiti et al., 2020; Jaramillo et al., 2023).

Research shows that governance aligned with clinical coordination is more effective than top-down control (Prades et al., 2017). Participatory governance enhances legitimacy and responsiveness (Attree et al., 2010). More recent studies highlight governance as a dynamic process shaped by interaction, trust, and inclusive engagement. Collaborative mechanisms - such as principled engagement, shared motivation, and joint capacity - are seen as key to effective cross-boundary functioning (Tremblay et al., 2025).

Overall, neither formal mandates nor clinically credible leadership alone are sufficient to support integration without deliberative processes that promote mutual understanding, distributed leadership, and the inclu-

sion of actors beyond the hospital, including primary care and community providers.

9. Knowledge Exchange and Capacity Building

Networks are also spaces of learning. Contributions emphasize the role of continuing education, best practice dissemination and joint training initiatives in enhancing the adaptive capacity of the network and promoting institutional learning (Schiavone et al., 2024; McInnes et al., 2015; Broccatelli et al., 2025; Prades et al., 2017; Brown et al., 2016). The dimension of knowledge sharing and organizational learning reinforces the entire system, creating a positive, open, and trust-based environment, where inclusive participation and dialogue among professionals become the glue that holds the network together and enables its effective functioning. In this perspective, adaptive learning environments that integrate project-based approaches and emphasize collaborative sensemaking have been shown to strengthen networks' capacity for innovation and service improvement (Gordon et al., 2018). These capabilities are particularly relevant in complex settings, where change processes benefit from ongoing dialogue and flexible coordination among diverse actors.

Together with the nine drivers, the notion of performance also emerges from the literature as a key analytical dimension, though with diverse meanings and methods, reflecting both quantitative measurement frameworks and more qualitative or interpretive conceptions.

On one hand, several contributions adopt structured indicator-based systems. For instance, performance is framed through the Donabedian triad of structure, process, and outcomes, operationalised via key performance indicators such as cost reduction, timeliness of care, and preventive capacity (Schiavone et al., 2023). National-level initiatives also emphasise measurable outcomes, with performance monitored through standardised indicators linked to cancer plans (Tremblay et al., 2024). Other studies focus on more specific metrics, such as cost performance—defined as total cost per patient annually (Yan et al., 2024)—or appropriateness of follow-up practices, assessed through retrospective analysis of clinical data (Fuso et al., 2011). Accreditation processes, such as those of the OECI, also frame performance as the ability to standardise services, monitor outcomes, and strengthen the integration of care and research (Ancarani et al., 2015). Broader frameworks, instead conceptualise performance as value creation across multiple domains, measured through survival, cost savings, scientific output, and policy impact (Cerisoli et al., 2022).

On the other hand, a strand of literature conceives performance in qualitative and institutional terms. In this view, performance is linked to the ability of networks to sustain coordination, stability, adequate resources and responsiveness to stakeholders' needs (Addicott et al., 2007). Studies

of inter-organisational dynamics also highlight the coexistence of competition and cooperation, suggesting that performance may be expressed in terms of continuity, integration, efficiency and legitimacy rather than formal indicators (Peng, 2009). In such contexts, performance is frequently equated with equity of access and reduction of disparities, even when no quantitative measurement is proposed (Partridge et al., 2005; Parra et al., 2020).

Taken together, these studies show that performance in oncology networks is not a univocal construct but rather a multidimensional and contested notion. It may be assessed through structured KPIs and accreditation tools, but it can also be understood as the ability of networks to sustain legitimacy, equity and coordination. This diversity reinforces our methodological choice to focus on the drivers that shape oncology networks and their outcomes, rather than privileging a single quantitative definition of performance.

Overall, the nine drivers identified can be mapped across the three main phases of oncology networks development: establishment, consolidation, and long-term durability. Contextual factors such as the territorial and relational setting, along with clear regulatory frameworks and institutional incentives, are essential for the establishment of oncology networks. The consolidation phase is driven by effective stakeholder engagement, leadership and governance, data sharing, and standardization mechanisms, which support coordination, legitimacy, and operational coherence. Finally, relational trust, shared values, and ongoing knowledge exchange and capacity building are critical to ensuring the resilience and durability of the oncology networks over time.

Equity as Outcome and Reduction of Disparities

In oncology networks, equity is a core outcome that signals the system's ability to reduce unjust disparities in access, quality, and health outcomes. Achieving equitable access to high-quality cancer care, especially in rural or underserved areas, is a central goal embedded in many network configurations (Empereur et al., 2018; Adsul et al., 2023; Semprini et al., 2024; Doolin et al., 2014; Braveman et al., 2003). Networks are thus conceived as redistributive tools, extending specialised expertise and standardising care to mitigate territorial and demographic inequalities. However, evidence from low- and middle-income contexts shows that this redistributive effect depends on strong governance, institutional backing and locally embedded capacities (Sagan et al., 2022). Progress in equity can create positive feedback loops, strengthening the network model, building legitimacy and reinforcing professional and political engagement. Conversely, persistent disparities or inefficiencies may prompt corrective policies, resource reallocations, or governance reforms (Empereur et al., 2018; Thebaud et al., 2021). When these enabling conditions are in place, oncology networks can actively drive equity by strategically co-

ordinating resources, aligning institutional efforts and reducing territorial gaps through integrated care delivery (Parra et al., 2020).

Equity, however, is not a univocal construct. It can refer to reducing barriers in access, for example, the ability of patients in peripheral regions to reach specialized diagnostic and treatment facilities (Fuso et al., 2011; Parra et al., 2020), but also to narrowing inequalities in outcomes, such as survival or quality of life across social groups (Braveman et al., 2003; Adsul et al., 2023). Alongside equity, the literature identifies other widely recognized dimensions of performance, care management, quality, innovation and research (Schiavone et al., 2023; Tremblay et al., 2024; Ancarani et al., 2015). Care management is often conceived as a multidimensional construct, combining efficiency in the use of resources, economic sustainability, and the fluid coordination of patient trajectories. It reflects the ability of networks to align organisational efficiency with patient-centredness, ensuring that continuity of care does not come at the expense of inclusiveness (Tremblay et al., 2024; Cecilio et al., 2012). Quality, likewise, is not reducible to a single metric: it can be assessed through clinical outcomes, but also through patient-reported experiences or the overall usability of services, each perspective highlighting different priorities and sometimes leading to divergent policy choices (NCCN, 2009; Ancarani et al., 2015; Fuso et al., 2011). Finally, innovation and research represent a powerful lever for improving oncology networks, yet access to their benefits may vary across populations and territories. While advances in technology and scientific production can raise the overall standard of care, they may also exacerbate disparities if access remains concentrated in well-resourced institutions (Cerisoli et al., 2022; Schiavone et al., 2023).

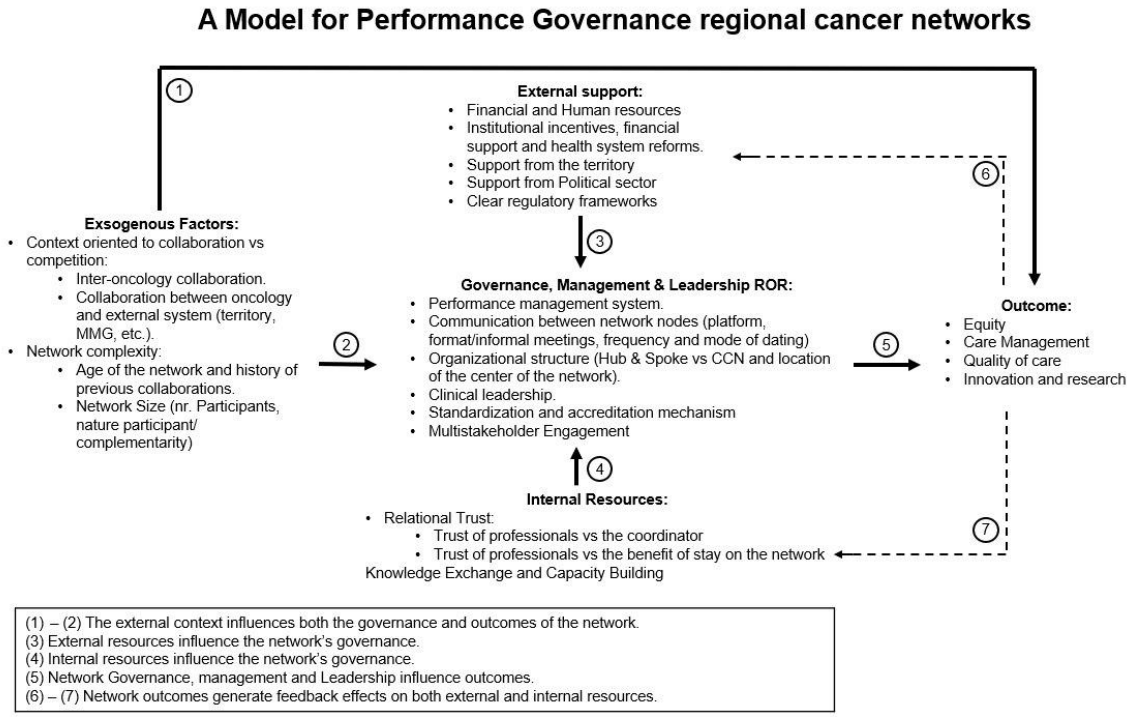
Overall, these dimensions suggest that oncology networks operate within a complex performance space, where objectives can reinforce each other, such as when innovation strengthens quality or when equity enhances legitimacy, but can also generate tensions. Recognizing these interdependencies is crucial to understanding how oncology networks can be governed and implemented to balance competing pressures while sustaining their transformative potential.

6. Discussion

The thematic categories identified in the literature do not represent siloed or static elements. On the contrary, studies consistently show that these factors interact dynamically, reinforcing or compensating one another, across different levels and phases of network development. Rather than functioning as isolated enablers, they constitute core determinants of network performance, shaping the capacity of oncology networks to respond to complexity and fulfil public health objectives. This interdependence underscores the need for a theoretical framework that can account not only for the presence of these drivers but also for their strategic coordination

and multidimensional interplay. To move beyond a purely descriptive taxonomy, we propose a framework that highlights the variables of oncology networks linked to their performance. Based on the results found through the SLR, the *Dynamic Multidimensional Network Performance Model* (Cepiku, 2013) has been adapted to oncology networks (Figure 5).

Figure 5 – Adaptation of the Dynamic Multidimensional Network Performance Model to oncology networks



The first macro-category focuses on *exogenous factors*, which include elements for which network managers or members have limited control. For example, a regional context characterized by a strong culture of collaboration can significantly enhance synergies among cancer units within the network's facilities. Similarly, effective collaboration between cancer services and other components of the healthcare system — such as community health services, general practitioners, and social services — is crucial for the success of the network. Additional exogenous factors beyond the network's control include its complexity, determined by the number of members, its maturity (measured in years of operation), and the nature and complementarity of the participating facilities. These factors directly influence the network's capacity to achieve outcomes, such as improved patient care, higher quality of services, equity in access, and support for innovation and research.

These outcomes, in turn, affect the availability of *internal resources* (the second macro-category). Internal resources are primarily defined by the

level of trust within the network-both the trust professionals place in the network coordinator and their confidence in the benefits of being part of the network. This trust is nurtured through clear and consistent communication, which enables continuous knowledge updates for members and promotes proactive responses to emerging challenges. In a complex context such as oncology, where numerous actors interact, trust facilitates the timely exchange of information and aids in the clear definition of objectives while minimizing conflicts. This contributes to improving the efficiency and quality of the services offered to patients (Ferlie et al., 2010; Simmons et al., 2015).

Another element that influences network outcomes is represented by *external resources* (the third macro-category), which include funding, essential for the development of technologies and IT infrastructure, healthcare personnel, and the recognition of time dedicated to collaboration. External resources also include the support provided by local communities and regional political institutions to the network.

The three macro-categories described (exogenous factors, internal resources, and external resources) influence the fourth macro-category of enabling factors, which consists of the *governance, management,* and *leadership* of the network. Network governance refers to the coordination of collective action by a central entity, aimed at optimizing the network's overall functioning. In the oncology field, network governance encompasses the set of rules, mechanisms, decision-making structures, and coordination practices necessary to effectively manage collaboration among the various stakeholders involved in delivering oncology care (Morando and Tozzi, 2014). Governance can be either centralized or distributed and may involve actors with different profiles and expertise. Based on the governance models examined in the network literature (Provan and Kenis, 2008), the structures adopted in the oncology field are the *CCCN* model and the *Hub & Spoke* model. The first model corresponds to a self-governed network that employs a centralized approach to oncology care through various healthcare facilities integrated within a single network, aiming to provide comprehensive patient care. The second governance model is associated with the *Lead Organization*. This model involves a hierarchical structure in which a central facility (Hub) delivers specialized treatments and coordinates several peripheral centers (Spokes) distributed across the regional territory, which handle basic diagnostic and therapeutic activities.

The fourth macro-variable also includes the types of monitoring and evaluation systems of the network, and the tools and communication methods adopted by the network's actors. Finally, the type and styles of leadership within the network are elements that affect the results. Leadership can be held by a figure with either clinical or administrative skills and plays the role of a facilitator. The leader guides the organizations involved toward a common mission, activating the necessary resources (Cunning-

ham et al., 2012), harmonizing the interests of the various actors, and reducing conflicts (Simmons et al., 2015; Dominello et al., 2018). Along with exogenous factors, the macro- category of governance, management, and leadership of the regional cancer network also significantly influences its outcomes.

7. Implications and conclusions

The framework allows us to infer several implications for both management and policy. Healthcare managers involved in oncology networks should invest in developing robust performance management systems to continuously monitor processes and use data to drive improvements in network outcomes. Leadership style is also crucial and should not be taken for granted—network leaders need to adapt their approach based on the characteristics of participants and the outcomes they aim to achieve. Moreover, stakeholder engagement mechanisms should be thoughtfully planned by both the leadership and the governance body to ensure all actors are aligned and perceive clear benefits from being part of the network. Effective communication – both formal and informal – between network nodes should be promoted and supported through appropriate digital platforms to enhance alignment, learning, and consistency across the network. Communication also plays a key role in building trust, a critical factor for successful oncology networks. Trust among professionals, including between coordinators and peripheral actors, is essential for knowledge exchange and commitment to the network's goals. Management should facilitate transparent processes and define shared objectives to foster this trust. Furthermore, it is essential to support professional development and establish structured mechanisms for knowledge sharing (e.g., communities of practice, shared learning platforms), to help disseminate innovation and best practices throughout the network.

Implications for policymakers are primarily linked to the exogenous and external factors highlighted in the framework. Policymakers should ensure the availability of adequate financial and human resources, as well as clear and supportive regulatory frameworks, to enable networks to achieve their intended outcomes. Regulatory frameworks (e.g., regional policies) should be designed to promote collaboration over competition, including mechanisms to incentivize inter-oncology and cross-sectoral collaboration. While standardization (e.g., accreditation criteria) is important, policies should also allow for local adaptations in governance structures, especially in heterogeneous regions. Given that strong information systems are essential to support network performance management and ensure transparency, policymakers should either fund or provide such systems to the networks. Finally, in order to promote network development on a national scale, learning from high-performing networks should be institutionalized at the policy level to facilitate the scaling of best practices.

Overall, this review has demonstrated that the performance of oncol-

ogy networks is shaped by interdependent drivers. Interpreting these dimensions through a multidimensional lens is essential to inform the design, implementation, and evaluation of oncology networks across health systems. As such, oncology networks represent not only a promising model for delivering integrated cancer care but also a transferable framework for collaborative governance in complex healthcare environments. While this study provides a comprehensive conceptual framework for understanding the role and functioning of oncology networks, limitations must be acknowledged. The analysis was based on a selection of academic databases, which, although highly reliable, may not cover the entirety of relevant publications available worldwide. As a result, some recent studies or works published in languages other than English may not have been included. Nevertheless, the sources consulted are considered authoritative and provide a solid foundation for the reflections and interpretations proposed.

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