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Cancer Care Inequalities in Low- and Middle-Income Countries: Oncology, Palliative Care, and Public Health Perspectives

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Abstract

Cancer care inequalities remain a major global public health challenge, particularly in low- and middle-income countries (LMICs), where increasing cancer incidence and mortality intersect with limited healthcare resources, delayed diagnosis, workforce shortages, restricted access to treatment, and insufficient palliative care services. Despite advances in oncology, substantial disparities persist in cancer prevention, screening, diagnostics, treatment availability, and survivorship outcomes between high-income and resource-limited settings. Public health systems in LMICs often face challenges related to financing, infrastructure, geographic inequities, and shortages of trained oncology and palliative care professionals. Furthermore, sociocultural, gender-related, and economic barriers contribute to delayed care-seeking and poor outcomes. This narrative review examines major inequalities in global cancer care, with a particular focus on oncology and palliative care delivery in LMICs. The review discusses disparities in cancer epidemiology, access to diagnostics and treatment, workforce capacity, financial toxicity, palliative care integration, and health policy challenges. Potential strategies for reducing inequalities, including multidisciplinary care models, universal health coverage, early palliative care integration, workforce development, and international collaboration, are also explored. Addressing cancer care inequalities requires coordinated public health, clinical, and policy interventions aimed at improving equitable access to comprehensive cancer care worldwide.

Keywords: cancer care inequalities, oncology, palliative care, public health, LMICs, global oncology, health disparities

Introduction

Cancer represents one of the leading causes of morbidity and mortality worldwide and is increasingly recognized as a major global public health challenge. According to the International Agency for Research on Cancer (IARC), approximately 20 million new cancer cases and 9.7 million cancer-related deaths occurred globally in 2022 (Bray et al., 2024). Although advances in cancer prevention, diagnostics, targeted therapies, immunotherapy, and supportive care have improved survival in many high-income countries, substantial disparities remain between countries with differing socioeconomic resources.

Low- and middle-income countries (LMICs) carry a disproportionate burden of cancer mortality despite often having lower incidence rates compared with high-income countries (Sung et al., 2021). Limited healthcare infrastructure, insufficient access to early detection programs, delayed diagnosis, inadequate treatment availability, financial barriers, and shortages of trained healthcare professionals contribute to poor outcomes in resource-limited settings (Knaul et al., 2018). In many LMICs, patients present with advanced-stage disease due to restricted access to screening and diagnostic services, resulting in lower survival rates and increased symptom burden.

In addition to inequalities in oncology treatment access, palliative care disparities remain a critical public health issue. The World Health Organization (WHO) estimates that millions of patients worldwide experience serious health-related suffering without access to adequate palliative care services or opioid analgesics (Connor & Sepulveda Bermedo, 2014). Palliative care services in many LMICs remain underdeveloped due to limited funding, insufficient workforce capacity, regulatory barriers, and a lack of integration into national cancer control strategies.

Cancer care inequalities are influenced not only by economic limitations but also by geographic, gender-related, sociocultural, and political factors. Rural populations frequently experience poorer access to oncology services compared with urban populations, while women and socially vulnerable groups may face additional barriers to timely diagnosis and treatment (Ginsburg et al., 2023). Public health approaches aimed at strengthening health systems, expanding universal health coverage, improving workforce training, and integrating multidisciplinary cancer care are increasingly recognized as essential components of equitable oncology care.

This narrative review explores major inequalities in oncology and palliative care in LMICs from clinical and public health perspectives. The review discusses disparities in cancer epidemiology, diagnostics, treatment access, workforce capacity, palliative care integration, financial toxicity, and policy challenges, and highlights potential strategies to improve global cancer care equity.

Global Cancer Burden and Epidemiological Disparities

The global cancer burden continues to rise due to population aging, urbanization, lifestyle changes, tobacco use, obesity, environmental exposures, and infectious risk factors (Bray et al.,

2024). While high-income countries often report higher cancer incidence rates due to longer life expectancy and broader screening coverage, mortality rates remain disproportionately high in LMICs because of delayed diagnosis and limited treatment access.

According to GLOBOCAN 2022 estimates, breast, lung, colorectal, prostate, and stomach cancers remain among the most common malignancies globally (Bray et al., 2024). However, substantial geographic differences exist in both incidence and mortality patterns. For example, cervical cancer remains highly prevalent in many LMICs due to inadequate human papillomavirus (HPV) vaccination and screening programs, while tobacco-related cancers continue to pose significant challenges in Eastern Europe and parts of Asia.

Late-stage presentation is one of the most important contributors to poor cancer outcomes in LMICs. Delayed diagnosis frequently results from limited awareness, sociocultural stigma, lack of screening infrastructure, insufficient pathology services, and restricted access to imaging technologies (Knaul et al., 2018). Consequently, many patients are diagnosed at advanced stages when curative treatment is no longer feasible.

Furthermore, mortality surveillance systems may underestimate the true cancer burden in resource-limited settings. Incomplete death registration systems, diagnostic uncertainty, and inaccurate death certification contribute to underreporting of cancer mortality and increased classification of deaths under ill-defined or unknown causes (Brooks & Reed, 2017). These challenges complicate public health planning and resource allocation.

Barriers to Cancer Diagnosis and Treatment

Delayed Diagnosis and Screening Inequalities

Early detection plays a critical role in improving cancer outcomes. However, many LMICs lack organized national screening programs for common cancers such as breast, cervical, and colorectal cancer. Even where screening programs exist, participation rates may remain low because of financial barriers, geographic inequalities, low health literacy, and limited public awareness.

Patients living in rural and underserved areas often experience substantial delays in accessing diagnostic services. Pathology and imaging services may be centralized in urban centers, requiring patients to travel long distances for evaluation and treatment. Such delays can contribute to disease progression and poorer survival outcomes.

In addition, sociocultural stigma and fear associated with cancer diagnoses may discourage individuals from seeking timely medical care. Women in some regions may face additional barriers stemming from gender inequality, caregiving responsibilities, or limited decision-making autonomy (Ginsburg et al., 2023).

Treatment Access and Resource Limitations

Cancer treatment inequalities are particularly evident in access to surgery, radiotherapy, systemic therapy, and targeted therapies. Many LMICs face shortages of oncology centers, radiotherapy facilities, chemotherapy agents, and trained oncology professionals (Sullivan et al., 2015).

Radiotherapy availability remains especially limited in many low-resource settings. The Lancet Oncology Commission reported substantial deficits in radiotherapy infrastructure across LMICs, with some countries lacking even a single radiotherapy machine (Atun et al., 2015). Consequently, many patients are unable to receive potentially curative or symptom-relieving treatment.

Access to modern systemic therapies, including targeted therapies and immunotherapy, is often restricted by high costs and reimbursement limitations. Even essential chemotherapy drugs may be intermittently unavailable due to supply chain disruptions and financial constraints.

Workforce Shortages and Health System Challenges

Human resource limitations are among the most significant barriers to equitable cancer care in LMICs. Many countries experience severe shortages of medical oncologists, radiation oncologists, oncology nurses, palliative care specialists, pathologists, and psycho-oncology professionals.

Healthcare workforce shortages contribute to increased workload, delays in treatment initiation, reduced continuity of care, and burnout among healthcare providers. In many settings, oncology care is concentrated in major urban centers, further exacerbating geographic disparities.

Multidisciplinary care models are increasingly recognized as essential for improving cancer outcomes and patient-centered care. Multidisciplinary teams typically include oncologists, surgeons, radiation oncologists, palliative care physicians, psychologists, nurses, social workers, and rehabilitation specialists. However, implementation of multidisciplinary oncology care remains inconsistent in many LMICs due to workforce limitations and insufficient institutional support.

Health system fragmentation also contributes to inequalities in cancer care delivery. Poor coordination among primary care, oncology services, and palliative care providers can lead to delayed referrals, inadequate symptom management, and fragmented patient experiences.

Palliative Care Inequalities

Palliative care is recognized by the WHO as an essential component of comprehensive cancer care. Nevertheless, major disparities persist in access to palliative care services globally, particularly in LMICs (Connor & Sepulveda Bermedo, 2014).

Patients with advanced cancer in resource-limited settings frequently experience untreated pain and psychological distress due to inadequate access to opioid analgesics and specialist palliative

care services. Regulatory restrictions, stigma surrounding opioid use, insufficient training, and limited government funding contribute to poor access to symptom management.

Integration of palliative care into oncology services has been associated with improved quality of life, better symptom control, enhanced communication, and reduced healthcare utilization (Temel et al., 2010). Early integration of palliative care is increasingly recommended by international oncology organizations, including the European Society for Medical Oncology (ESMO) and the American Society of Clinical Oncology (ASCO).

However, the implementation of integrated palliative oncology models remains challenging in many LMICs due to workforce shortages, limited infrastructure, and inadequate reimbursement systems. Public health approaches aimed at strengthening palliative care policies, opioid availability, and workforce training are essential for reducing cancer-related suffering.

Financial Toxicity and Socioeconomic Inequalities

Financial toxicity refers to the economic burden experienced by patients and families as a consequence of cancer treatment costs. Cancer-related financial hardship can significantly affect treatment adherence, quality of life, and psychological well-being.

In many LMICs, out-of-pocket healthcare expenditures remain high, and patients may experience catastrophic financial consequences related to diagnostics, treatment, transportation, and supportive care costs (Knaul et al., 2018). Financial barriers may force patients to delay or discontinue treatment.

Socioeconomic inequalities are closely linked to disparities in cancer outcomes. Lower-income populations often experience higher exposure to cancer risk factors, lower screening participation, delayed diagnosis, and reduced access to high-quality treatment.

Gender inequalities may further influence cancer outcomes. Women in resource-limited settings may experience reduced access to preventive services, delayed diagnosis, and limited healthcare decision-making power (Ginsburg et al., 2023).

Public Health and Policy Approaches to Reducing Inequalities

Reducing cancer care inequalities requires coordinated clinical, public health, and policy interventions. National cancer control programs play a central role in strengthening cancer prevention, early detection, treatment access, survivorship care, and palliative care integration.

Universal health coverage initiatives may improve equitable access to oncology services by reducing financial barriers and expanding reimbursement mechanisms. Investment in workforce development, oncology infrastructure, radiotherapy capacity, and pathology services is also essential.

Implementation of multidisciplinary care models may enhance coordination between oncology and palliative care services while improving patient-centered care delivery. Public health strategies aimed at improving health literacy, expanding cancer screening programs, and addressing geographic disparities are critical components of cancer control.

International collaboration and global oncology initiatives may help support capacity building in resource-limited settings through training programs, research partnerships, and knowledge exchange.

Future Directions

Future efforts to reduce global cancer care inequalities should focus on strengthening health systems, improving cancer surveillance, expanding access to early diagnosis, and integrating palliative care into routine oncology practice.

Telemedicine and digital health technologies may improve access to specialist oncology consultations in underserved regions. Artificial intelligence-based diagnostic tools and implementation science approaches may also contribute to more efficient cancer care delivery.

Further research is needed to better understand regional disparities in cancer outcomes, evaluate health system interventions, and identify sustainable strategies for improving equitable access to comprehensive cancer care.

Conclusion

Cancer care inequalities remain a major global public health challenge, particularly in LMICs, where healthcare systems frequently face substantial resource limitations. Disparities in cancer prevention, diagnosis, treatment access, workforce capacity, and palliative care contribute to poor patient outcomes and increased mortality.

Addressing these inequalities requires integrated oncology and public health approaches that strengthen healthcare systems, improve access to multidisciplinary care, expand palliative care services, and reduce financial and geographic barriers to treatment. International collaboration, evidence-based policy development, and investment in workforce and infrastructure are essential for achieving equitable global cancer care.

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