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A reflective analysis on the inequities in cancer diagnosis and treatment in Latin America: a call to action for public health



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Abstract

Cancer continues to be a significant public health challenge in Latin America and the Caribbean (LAC), marked by rising incidence and mortality rates and a projection of increased burden by 2040. Despite the recognized importance of early diagnosis and treatment, the LAC region faces profound disparities in cancer care access due to socioeconomic, geographic, and educational barriers. These inequities are exacerbated by a lack of medical specialists, healthcare access limitations, and the distribution of resources, especially in rural areas. Social determinants of health (SDH) such as income level, educational attainment, and geographic location further contribute to delayed diagnoses and poor treatment outcomes. Addressing these barriers, recent initiatives emphasize strategies like telepathology networks, health education programs, and the establishment of cancer support networks to improve early diagnosis and quality of care. This review explores these SDH-based disparities in cancer care within LAC, examining innovative approaches aimed at reducing health inequities and improving outcomes for underserved populations. Through targeted interventions, the article highlights the critical need for policies promoting equitable access to cancer care as a fundamental public health objective in LAC.

Keywords Latin America and the Caribbean, Cancer, Diagnosis, Social determinants of health, Inequities

Background

According to the Global Cancer Observatory (GLO-BOCAN), Latin America and the Caribbean (LAC) had a population of 668,450,799 in 2022. The estimated annual cancer incidence for both genders was 1,551,060 new cases, with 782,217 cases in women and 768,843 cases in men. The one-year mortality rate was reported at 749,242 individuals, and the five-year prevalence was approximately 4,096,032 people [1]. This disease affects

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thousands of people in both the short and long term; however, not everyone affected has the same access to timely care.

Early cancer diagnosis is crucial in the battle against the disease, offering hope for better treatments and outcomes. It significantly enhances quality of life by allowing patients to access treatment options at earlier stages when they are most effective. However, early cancer diagnosis remains a global challenge [2].

Barriers such as lack of awareness, limited access to screening programs, deficit of clinical trials in the Latino population and social stigmas surrounding the disease hinder progress [3]. There is a global inequality gap in cancer care, with early diagnosis and comprehensive treatment available in over 90% of cases in high-income

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countries, compared to approximately 15% in low- and middle-income countries [4]. This disparity is particularly concerning given that nearly two-thirds of total cancer deaths occur in these regions. One example of this inequality is the five-year survival rate for breast cancer, which is below 65% in Brazil [5] and significantly lower in other Latin American countries. In Bolivia, for instance, breast cancer incidence reaches 34.2 per 100,000 women, with a mortality rate of 11.6 per 100,000 women [6]. These figures highlight the urgent need for improved cancer care access and treatment in the region.

In the Latin America and Caribbean (LAC) region, cancer caused 1.4 million deaths in 2020, with 47% of these occurring in people under 70 years old. The region also had an estimated 4 million cancer cases, projected to increase to 6 million by 2025 [7] Latin America faces a moderate shortage of pathologists, with approximately 17 pathologists per million population and an estimated total of 7,000 pathologists. Timely diagnosis and prompt initiation of treatment are crucial in combating cancer, particularly in regions with high cancer burdens and limited healthcare resources [8].

Pathologists play a pivotal role as a cornerstone of public health initiatives, ensuring accurate diagnoses and guiding effective treatment strategies. However, there are a variety of factors that influence patients' access to early diagnosis and opportune treatment, such as socioeconomic status, education level, geographic location, and access to healthcare facilities [9]. These conditions which people are born with and the environments in which they live that influence their overall health are known as social determinants of health (SDH) and can significantly impact a patient's ability to receive timely cancer care [10].

In 1980, efforts in the United Kingdom to promote the report of the Working Group on Inequalities in Health initiated important discussions about social determinants of health (SDH). While the report did not lead to immediate policy changes, it challenged the belief that health factors are unmodifiable. Instead, it highlighted the need for social policy reforms focused on equity in education, housing, and working conditions, and emphasized that many health issues can be addressed through changes in healthcare services. Although conservative policymakers did not adopt the proposal at that time, the conversation it sparked helped pave the way for future progress in health equity [11].

In the late 1990s, Sir Michael Marmot conducted the Whitehall Studies, which provided clear evidence of how social gradients affect health [12]. These studies tracked British civil employees and found that individuals in lower-ranking positions experienced worse health outcomes than those in higher positions. This research demonstrated how addressable social inequalities contribute to health disparities and emphasized the need for policy action to address modifiable SDH inequalities, particularly in Western Europe [11].

Health disparities refer to differences in health outcomes among various groups and can be classified as either inequalities or inequities. Inequalities are unchangeable factors, such as genetic traits, gender, which lead to unavoidable health outcomes. In contrast, inequities arise from differences in health status or access to resources due to social conditions. These conditions include education, employment, healthcare services, housing, income, the physical environment, public safety, and transportation. Inequities are considered unfair and can be addressed and modified through effective government policies [13].

SDH significantly influence health inequities and have far-reaching implications for health outcomes. These factors, support, shape individuals' ability to maintain good health. As a result, those in disadvantaged social conditions often experience poorer health outcomes, including higher rates of illness, delayed diagnosis, and limited access to treatment. Addressing SDH is therefore crucial in reducing these inequities and improving overall public health [14].

This article summarizes the SDH that affect timely cancer diagnosis and treatment in LAC, and highlights new strategies, such as telepathology, health education and other initiatives aimed at improving the quality of life and prognosis for oncology patients while reducing health inequities. By addressing barriers like access to healthcare, geographic location, socioeconomic status, and availability of specialized care, these strategies seek to ensure that all patients, regardless of their social or economic background, receive earlier diagnoses and more effective treatments, ultimately improving outcomes and closing the gap in health disparities.

Geographic barriers and access pathways in remote locations

Adequate facilities are crucial for providing specialized care, particularly for cancer patients. Currently, more than half of the world's population lives in urban areas, and projections indicate that this figure will increase to nearly 70% by 2050. In LAC, 80% of the region is already urbanized. For example, in Colombia, 91% of the population resides in urban areas, while only 9% lives in rural regions [15].

In the rural region, population often resides in areas where oncologists and experts in cancer care are not available and local health centers cannot provide specialized cancer prevention, screening services, treatment, or survivor care [16]. This is due to the concentration of cancer specialists in large urban centers, where advanced treatments are available, leaving rural patients to travel long distances even for basic care. This geographical disparity leads to extended waiting times for treatment, with reports from Mexico and Brazil showing delays of seven months or more from diagnosis to the start of treatment [17].

In isolated areas, communities often face significant barriers to accessing healthcare due to limited infrastructure and transportation options. For example, some remote regions rely on boat travel as the primary means of transport, which can delay or complicate the delivery of essential medical services [18]. Also, in LAC public transit has been influenced by socio-spatial inequality, this disparity manifests in urban areas where impoverished communities often inhabit precarious and hazardous environments. These settlements, located in steep hillsides or flood-prone zones, frequently lack essential infrastructure and utilities. To illustrate, in cities like Rio de Janeiro and Caracas, informal settlements known as "favelas" or "barrios" are constrained into unsuitable areas due to the terrain, flooding susceptibility, or their designation as protected ecological zones. This condition complicates efforts to provide equitable services and infrastructure to all residents, reinforcing the cycle of disadvantage faced by marginalized populations [16].

In many LAC countries, particularly where long distances make it hard to reach advanced care centers and specialists are mainly in large cities, cancer detection and treatment can be delayed. This delay lets the disease progress, which harms patient outcomes and raises healthcare costs. Early detection is considered the top public health strategy for controlling and improving cancer survival, and it allows cancer to be identified at stages when effective treatments are readily available [19]. To address these issues, several initiatives have been implemented. Telemedicine networks in Peru, Ecuador, and Colombia have been introduced to improve access to diagnostic services and reduce the number of lost health cases.

In Colombia, we have created a telepathology network known as the GLORIA network [20]. Due to the country's geographic challenges, accessing specialized pathologists in remote areas can be difficult, which delays timely diagnoses and treatment for cancer patients. The main goal of this proposal is to establish a telepathology program that supports oncological diagnostics and fosters research in artificial intelligence related to malignant tumors. Other strategic decentralization efforts, such as the opening of a chemotherapy center in Lamas, San Martín, Peru, aim to bring specialized services closer to rural populations. Training local healthcare workers in remote areas to perform specific cancer-related tasks such as performing RNA sequencing to study gene expression profiles in tumor tissues and Identifying biomarkersIdentifying biomarkers has also been a strategy to enhance early detection and treatment capabilities [9].

Efforts to enhance cancer care in rural areas focus on integrating health services into local infrastructure and training primary care providers. Programs such as Brazil's Primary Care Professional Valorization Program and Chile's Rural Practitioner Program provide incentives to attract doctors to underserved regions; however, challenges persist in retaining these physicians. Additionally, initiatives like Pro Mujer combine health and microfinance services to improve access and affordability for women in urban and periurban areas. Further research is needed to evaluate the long-term impact and effectiveness of these interventions on cancer care accessibility in Latin America [9].

Recognizing vulnerability in terms of health access: social gradient and cancer outcomes

The social gradient defines a breach within access to healthcare. Low socioeconomic levels, minority populations, and individuals with low educational levels might not have the same opportunities to be timely treated as their counterparts in higher socioeconomic strata [21]. This is why individuals in vulnerable and less favorable social conditions face more barriers to access adequate health care compared to those in more favorable circumstances [22]. To illustrate this situation Molina Berrio et al., conducted ay on cervical cancer an found that the leading causes of mortality in women between 43 and 65 years of age were related to barriers to accessing healthcare services. They also found women with subsidized health insurance and those without medical insurance have higher documented cases of worse healthcare assistance. Reports indicate that in this population, feelings of shame related to financial difficulties, living in rural areas, or appearing "dirty" or "unkempt" were usual. As a result, these women often received treatment at more advanced stages of the disease [23] [24].

One significant challenge in LAC involves people living in dispersed rural areas far from capitals and urban centers, where most residents tend to have lower educational levels, informal jobs, and lower incomes than those in cities. In these contexts, patients often face the burden of covering travel expenses that national health services should cover. However, approvals for such coverage are not always granted in a timely manner. As a result, patients must assume costs for transportation, diagnostic tests, medical consultations, medications, treatments, and copayments. Additionally, there have been documented cases of patients who had to leave their jobs to spend time obtaining these authorizations, leading to further economic hardship [24].

In 2022 the association between fragmentation of health care and 3-year overall survival in patients with colorectal cancer and breast cancer in Colombia was studied. A retrospectve cohort study reported that fragmentation of health care is associated with lower survival in this type of cancer patients in Colombia [25]. Also, in Colombia, exposure to more highly fragmented healthcare networks decreases overall 4-year survival for patients with colorectal cancer [26]. Another challenge is the difficulty in accessing chemotherapy treatment due to the long distances to cancer centers, hospitals, radiotherapy and chemotherapy facilities, and palliative care centers [27]. In a descriptive study, García and Quintero highlight that, beyond covering transportation expenses, patients often struggle with accommodation and food during their treatment. Many also lack access to supportive lodging that would help them navigate and move around the city, leading some to discontinue essential treatments and follow-up care [28]. Additionally, it's important to note that financial challenges affect not only patients but also healthcare institutions, which face persistent difficulties in providing timely and adequate diagnoses and treatments. This financial strain often results in the interruption of patient care [29].

The number of available cancer treatments has been linked to 1-year and 5-year survival rates for cancer patients. However, these medications are quite expensive, leading to an estimated increase of 15% per year in cancer drug costs in Latin America. Within the public health systems of the region, access to costly medications and technologies is limited, with many expensive therapies available only to patients with private insurance [16].

In Latin America, civil society has demonstrated the ability to contribute to improving opportunities for cancer patients through various areas and services, including psychosocial, medical, and educational support, as well as infrastructure and shelter [11]. A notable example is the creation of foundations, as seen in Honduras, where the Honduran Foundation for Children with Cancer provides free treatment to patients aged 0 to 18. Additionally, it offers both emotional and financial support, covering transportation, meals, and shelter, thereby involving both the patients and their families, ensuring that treatment is not interrupted [13].

Improving health education: access to information for early diagnosis and timely cancer treatment

Health education is a discipline focused on guiding and organizing educational processes to positively influence individuals and communities by improving their knowledge, practices, and prevention efforts related to health. This concept applies not only to healthcare professionals but also to the general population, as they too engage in learning and training about their health conditions, including cancer. Education actions must occur at multiple levels, including governmental, non-governmental, national, international, multilateral, regional, municipal, professional, and societal organizations [30]. There is a growing movement advocating for the creation of educational programs through workshops, online seminars, training programs, and centers for both patients and their families. Educational communication within health services is also crucial, as it plays a key role in primary care, diagnosis, treatment, and rehabilitation. According to the World Health Organization (WHO) and the Pan American Health Organization (PAHO), the Ottawa Charter defines health promotion as a global political and social process focused on enhancing the skills and capacities of populations and communities, while modifying social, environmental, and economic conditions to improve health outcomes [31].

In 2010, Wiesner et al. proposed creating a patient and family education center for cancer patients at the National Cancer Institute in Colombia. This initiative included an educational program designed to encourage dialogue, learning, and critical thinking, with three main components. First, they created booklets called the "Life Hope Series," which explain different types of cancer, their symptoms, diagnosis, and treatment options. Second, they developed brochures titled "The Path of the Cancer Patient," which help patients understand the stages of their process and provide guidance on diagnostic instructions from labs and imaging. Lastly, they included audiovisual materials, such as videos that inform patients about care and the side effects of chemotherapy and radiotherapy. It's important to note that these materials are implemented by healthcare personnel to guide patients and their families [32].

In a systematic review, Intriago Ganchozo JE and Callejas de Valero D. examined a study focused on school-aged adolescents aged 12 to 25 years. They found a significant lack of knowledge about HPV at the primary, secondary, and university levels, although awareness was higher among university students. They concluded that major intervention is necessary for younger generations, where the incidence of HPV is high and can lead to cervical cancer, however it is important to keep in mind that this is one of the might complications but it can lead to cervical cancer, anal cancer, oropharyngeal cancer, vulvar and vaginal cancer and penile cancer [33]. This highlights the importance of improving adolescents' understanding of this issue, as many have gaps in knowledge and interpretation, along with insufficient information. Additionally, interventions should address social and cultural taboos, raising public awareness about the importance of sexual health prevention and care. Educational institutions should also engage parents, as they play a key role in safeguarding their children's health, ensuring they receive accurate information and guidance to lower incidence and mortality rates [34].

Comprehensive support from clinical entities, along with the encouragement of family, friends, and close networks, is essential during critical situations such as cancer diagnosis, management, and treatment. This multidimensional support not only enhances the patient's emotional well-being but also improves therapeutic outcomes by creating a nurturing environment that is vital at every stage of the cancer's journey.

In a study by Cacante and Arias focusing on families with children diagnosed with cancer in Colombia, they highlighted the importance of social support. This concept, based in sociology and psychology, involves complex interpersonal relationships and is inherently multidimensional, incorporating various forms and levels of interaction. The sources of social support are diverse, including formal institutional networks and family systems, both of which are crucial for providing essential resources and emotional support [35].

Implementing cancer support groups is a vital aspect of psychosocial oncology care. These groups provide a structured environment where participants can share experiences, receive emotional support, and access information. While many patients benefit from the support of friends and family, these groups offer a unique opportunity to connect with peers who have similar experiences, fostering a sense of community and reducing feelings of isolation [36].

Research shows that participating in such groups can enhance psychological well-being by providing a safe and understanding space for individuals to process their emotions. Additionally, these groups support not only patients but also their children and family members, addressing the broader psychosocial impact of cancer.

Support groups can be delivered through various modalities, including in-person meetings, online platforms, or telephone support systems, ensuring accessibility and flexibility for participants. This adaptability is crucial for meeting the diverse needs of individuals affected by cancer, thereby optimizing the overall effectiveness of psychosocial interventions [37].

In addition to support groups, cancer patient organizations play a crucial role in advancing cancer control initiatives. These organizations have been instrumental in spreading accurate information to underserved communities, developing support programs that connect cancer survivors with patients, and promoting early cancer detection. By involving key stakeholders—such as healthcare professionals, lawmakers, and community leaders—these organizations help position cancer control as a priority in national public health agendas [38]. However, family member participation is fundamental as they are the primary patient's support group. It is crucial to clarify that technical information is not the only type of information a patient expects, including topics such as family planning, erectile dysfunction, amenorrhea, pregnancy, and infertility [32]. Nonetheless, families experience significant lifestyle changes that can drastically impact their social, work, and personal lives. The fear of losing a loved one creates feelings of desperation, disrupting the family's overall harmony. This situation leads to emotional and behavioral challenges, resulting in shifts in routines and roles within the family system. Families can provide vital social support that enhances quality of life and helps members adapt to their new circumstances [39].

Finally, in low- and middle-income countries (LMICs), a scoping review assessing supportive care interventions in LMICs revealed that efforts to give supportive care to cancer patients in these counties have significant impacts [40]. For example, in regions like the WHO Eastern-Mediterranean and South-East Asia, supportive interventions such as psychosocial support, symptom management, and patient navigation were shown to improve mental and physical health and enhance the quality of life for cancer patients [40]. This highlights the importance of fostering support networks, even in resource-constrained settings, as they can serve as a lifeline for individuals facing the challenges of cancer diagnosis, treatment, and beyond [40].

Conclusion

Cancer care is significantly influenced by individuals' social and economic circumstances, rooted in the social determinants of health (SDH). Factors such as income, education, access to healthcare, and geographical location can greatly impact how a person is diagnosed and treated. Unfortunately, inequities often affect disadvantaged populations, particularly in poorer and marginalized communities such as most LAC countries, making them more vulnerable to cancer.

Nowadays there are strategies that although have been used in other countries in the past years, are newly implemented in the region, adapted in a more culturally appropriate way to address these disparities. Health education programs for patients aim to raise awareness about cancer diagnosis, treatment, and self-care. Additionally, the promotion of social support networks and the establishment of national and regional cancer patient groups improve the quality of life for both patients and their families. These groups also play a key role in shaping public policy, advocating for patients' rights and ensuring timely access to care.

Telepathology also rises as an efficient and costeffective alternative to reduce inequities among cancer patients in Latin America. Projects like GLORIA-Colombia [20] allow the integration of the most remote and vulnerable areas in countries like Colombia with high-tech centers in urban areas. Through cutting-edge technology, these initiatives break down access barriers and improve diagnostic timeliness, which is crucial for the quality of life and prognosis of these patients.

Finally, although inequities in cancer diagnosis and treatment persist among vulnerable populations in Latin America-largely due to fragmented healthcare systems and limited resources, there is optimism in the innovative strategies and initiatives aimed at closing these gaps. By tackling the social determinants of health (SDH) that drive these disparities and aligning efforts with public health policies that promote universal access to care, the region can make significant progress in reducing inequities in cancer care. These initiatives not only hold the potential to improve survival rates and quality of life for cancer patients but also reflect a broader movement toward more equitable healthcare systems across Latin America. Ultimately, this contributes to the core mission of public health: ensuring that every person, regardless of their socioeconomic status, can attain the highest standard of health.

Abbreviations

LAC	Latin America and the Caribbean
SDH	Social determinants of health
GLOBOCAN	Global Cancer Observatory
WHO	World Health Organization
PAHO	Pan American Health Organization

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Consent for publication

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