Exploring factors and trends in place of death by cancer: a population-based study in Brazil

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Summary

Background The place of death profoundly affects end-of-life care quality, particularly in cancer. Assisting individuals at home enhances support, privacy, and control, reducing healthcare costs. This study seeks to elucidate factors associated and trends in place of death by cancer in Brazil.

Methods Using data obtained from the National Mortality Information System, this study extracted tumour topography, sociodemographic characteristics, and the place of death (outcome classified into hospital or home death) by cancer in Brazil from 2002 to 2021.

Findings The analysis included 3,677,415 cases, with 82.3% of deaths occurring in hospitals and 17.7% at home. Most participants were male (53.1%), had gastrointestinal tumours (32.2%), and resided in the Southeastern region (48.7%). Home deaths were more frequent in the Northeastern (30.2%) and Northern (24.8%) regions compared to the Southern (17.1%) and Southeastern (12.2%) regions. A strong inverse correlation was found between home deaths and the Human Development Index of the region. Over the years, there was a reduction in home deaths, followed by a recent increase. Individuals with no formal education, indigenous individuals, and patients from the North, Northeast, and Central-West regions had higher rates of home deaths, while patients with haematological malignancies had lower rates compared to those with gastrointestinal tumours.

Interpretation The minority of deaths by cancer in Brazil occur at home, with distinct trends over time. Home death was associated with regional, racial and educational level differences.

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Keywords: Cancer mortality; Place of death; Home death; Palliative care

Introduction

The place of death is a crucial indicator that incorporates the idea of end-of-life care quality, mainly in developed countries with healthcare systems capable of offering efficient support for palliative care at home.[1,2] Despite being relatively understudied, this outcome has piqued the interest of the scientific community, particularly in the context of cancer, which stands as one of the leading causes of morbidity and mortality globally.[3] When appropriate support is provided, the incidence of home death is often connected with expanded prospects of receiving physical and emotional assistance,

maintaining privacy, and exerting a greater sense of control over the surroundings. Moreover, it is also linked to lower healthcare costs and reduced risks of aggressive and futile treatments.[4–6]

However, within the framework of developing nations and resource-limited areas like Brazil, the absence of a robust system for home-based palliative care, combined with challenging clinical, socioeconomic, and environmental circumstances, may lead to the perception of home deaths as an unsettling sociodemographic indicator. Vulnerable housing structures of patients, limited access to specialised palliative care health teams,

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Research in context

Evidence before this study

The place of death is a critical factor influencing the quality of end-of-life care. Despite its relatively unexplored nature, this aspect has captured the scientific community's interest, especially in the context of cancer, a major contributor to global morbidity and mortality. The provision of appropriate assistance is often associated with an increased probability of home death, providing individuals with improved opportunities for physical and emotional support, privacy preservation, and greater control over their surroundings. Moreover, this connection is associated with reduced healthcare costs and a lower occurrence of aggressive and futile treatments. A comprehensive search in PubMed covering articles published over an extended period utilized keywords such as "end-of-life cancer care," "palliative care," "home death," and "cancer mortality." An in-depth analysis of US death records from 2003 to 2015 revealed that 49% of women with gynaecological cancer passed away at home or in hospices. Conversely, a study in São Paulo, Brazil, highlighted that 20% of cancer-related deaths took place at home. The lack of reliable nationwide data concerning the place of cancer-related death remains a substantial constraint.

Added value of this study

Within the vast and diverse landscape of Brazil, marked by significant social and health disparities across regions, there is

a critical need to uncover the realities of end-of-life care and regional inequities in cancer-related deaths. This study plays a crucial role in denouncing the poor conditions surrounding home deaths in Brazil, revealing the sociodemographic factors contributing to these outcomes and exposing the urgent need for improvement in end-of-life care practices. By highlighting regional disparities and shedding light on the negative implications of home deaths, this research acts as a powerful advocate for addressing inadequate public health conditions and enhancing care for patients with terminal cancer.

Implications of all the available evidence

The study highlights the importance of addressing inequalities in end-of-life care for vulnerable populations, encompassing individuals with limited education, indigenous groups, and residents in underdeveloped regions. It seeks to prompt governmental action in formulating policies that prioritize resource allocation for end-of-life care, particularly for the most vulnerable individuals, ultimately leading to a more equitable and compassionate healthcare system. Therefore, home deaths can indicate adequate healthcare in high-income nations but suggest healthcare insufficiency in middle-income countries like Brazil.

and diminished physical and emotional capabilities of families to provide necessary end-of-life care, all seem to contribute to heightening the concern in this situation.[7–9]

Confirming the notable differences in the frequency of home deaths across various countries and regions, a comprehensive analysis of United States death records from 2003 to 2015 revealed that 49% of women with gynaecological cancer died at home or in hospices.[10] In Brazil, according to a study conducted in São Paulo, 80% of deaths by cancer occurred in hospitals, with only 20% occurring in a home setting. Additionally, the domicile was not the preferred location for the majority of patients to die, particularly those with poorly managed symptoms.[7]

Considering the extensive Brazilian national territory and the social and health disparities among different regions of Brazil, as elucidated by Barbosa et al.,[11] and recognising that researching on end-of-life care for cancer patients can significantly contribute to the formulation of nationwide public policies, there is an outstanding need for a detailed understanding the place of death by cancer of occurrence nationwide. In this context, the study assumes particular importance as it aims to elucidate factors associated with the place of death by cancer and current trends in Brazil.

Methods

Data sources and ethical statements

This cross-sectional epidemiological investigation followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)[12] and utilised data obtained from the Mortality Information System (SIM after its initials in Portuguese)[13] in Brazil, encompassing a time series dataset spanning two decades (2002–2021). Extensive research has shown that the SIM has significantly improved the accuracy and completeness of death reporting, especially in the registration of unclear causes of death.[14–16] The data extraction took place on May 26, 2023. The death certificate in Brazil serves as a valuable repository of sociodemographic data. Since the study exclusively relied on de-identified information obtained from publicly accessible governmental sources, it was determined that obtaining ethical review board approval and informed consent from individuals was unnecessary.

Eligibility

The process of data curation was conducted utilising place and year of death as the primary factors. Only patients with deaths recorded as specific ICD-O-3 codes (processes used to identify and exclude misclassifications and misdiagnoses) as listed later in the manuscript were enrolled. Exclusion criteria were

deaths by cancer in patients under 20 years old and deaths by cancer in unknown location.

Data collection

The place of death was categorised as hospital death (when occurred in a hospital or other healthcare establishment) and home death (when occurred at home, in a public place or others). The explanatory variables assessed included: age group [<60 (adults) versus ≥60 (elderly) years], sex (male versus female), self-reported race/ethnicity (classified based on the Brazilian Institute of Geography and Statistics' categorisation of white versus black and mixed race versus yellow versus indigenous), educational level [no formal education versus 1–8 (basic to intermediate education levels) versus ≥8 (higher education levels) years], marital status (with partner, when married or in a stable union, versus without partner, when widowed, divorced, single or missing information). The Human Development Index (HDI) in 2010 by geographic region was also analysed; according to the United Nations Development Program classification, the HDI in 2010 for the North (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, and Tocantins) was 0.667, for the Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe) was 0.663, for the Central-West (Goiás, Mato Grosso, Mato Grosso do Sul, and Distrito Federal) was 0.757, for the South (Paraná, Rio Grande do Sul, and Santa Catarina) was 0.757, and for the Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo) was 0.766.[17] Geographical region of the state of residence was categorised according to the HDI in North, Northeast and Central-West versus South and Southeast (refer to map in Fig. 1).

Moreover, the tumour primary site was classified according to the 10th Revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10), and its evaluation involved extracting and grouping data from the SIM as per the guidelines provided by DATASUS.[13,18] This entailed classification into various categories, including lip, oral cavity, and pharynx (C0–C14); digestive organs (C15–C16); respiratory system and intrathoracic organs (C30–C34 and C37–C39); melanoma and skin (C43–C44); mesothelial tissue and soft tissues (C45–C49); breast (C50); female genitals (C51–C58); male genitals (C60–C63); urinary tract (C64–C68); lymphatic, hematopoietic tissue and related (C81–C85, C88, and C90–C96); eyes, brain, and other parts of the Central Nervous System (C69–C72); Undefined, secondary and unspecified sites (C76–C80); and other sites (D37–D48).

Statistical analysis

Time trend analyses were performed employing the Joinpoint Regression Program version 4.9 .1 .0 (National Cancer Institute of USA, 2022), entailing the fitting of straight lines to the observed percentage of deaths, incorporating selected joinpoints, and subsequently assessing their statistical significance via permutation methodology. This approach facilitated the identification of trend changes (joinpoints) and the calculation of the annual percent change (APC), 95% confidence interval (CI) and p-value through multiple pairwise comparison tests, indicating the potential rejection of the null hypothesis concerning APC = 0 (implying no trend changes in percentage of deaths). The statistically significant APC, when positive, indicates an increasing trend and, when negative, a decreasing trend.[19]

The correlation between the percentage of deaths at home and the HDI of the corresponding region where the death occurred was done at regional level and assessed using Pearson correlation analysis (assuming linear relationships) in the SPSS Statistics version 24.0 .0 .0 (IBM, São Paulo, Brazil). The Pearson's Correlation Coefficient was classified as perfect (1.0), very strong (0.90–0.99), strong (0.70–0.89), moderate (0.40–0.69), weak (0.20–0.39), very weak (0.01–0.19) or negligible (0.0).[20]

Univariate logistic regressions were used to obtain the values of odds ratios (OR) with a 95% CI, which were computed as a measure of effect size about factors associated with home deaths using the MedCalc software version 22.014. The p-value was considered statistically significant if lower than 0.05 and an OR was considered clinically relevant if lower than 0.50 or higher than 2.00.[21]

Role of funding source

Results

Among the 3,677,415 included cases, 3,025,072 (82.3%) were deaths that occurred in hospitals, and 652,343 (17.7%) were deaths that occurred at home (Fig. 2). Most participants were male (1,952,682, 53.1%), had tumours of the gastrointestinal site (1,185,663, 32.2%), and resided in the southeastern region (1,791,173, 48.7%) (Supplementary Table S1).

The frequency of home deaths was higher in the Northeastern (231,442, 30.2%) and Northern (41,876, 24.8%) regions in comparison to the Southern (123,022, 17.1%) and Southeastern (217,971, 12.2%) regions (Supplementary Table S1 and Fig. 1). There was a strong inverse correlation (Pearson's Correlation Coefficient = −0.95; p-value = 0.010) between the occurrence of home deaths and the HDI of the region where the death occurred.

Temporal trend analysis from 2002 to 2018 showed a significant overall reduction in the proportion of home deaths, ranging from 20.5% (2002) to 15.9% (2018) (APC = −1.9%; 95% CI = −2.5 to −1.4; p-value < 0.001). Conversely, the period from 2018 to 2021 showed
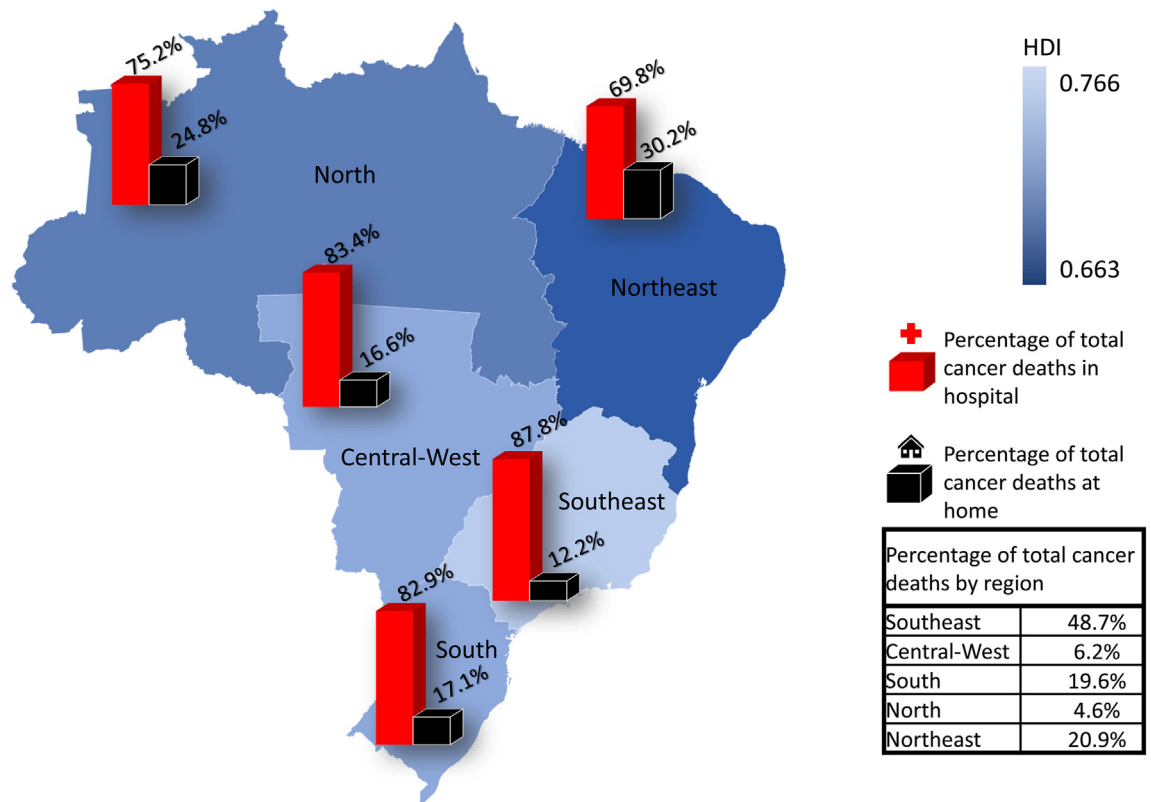
Fig. 1: Regional distribution of deaths by cancer according to location in Brazil (2002–2021). HDI, Human Development Index.
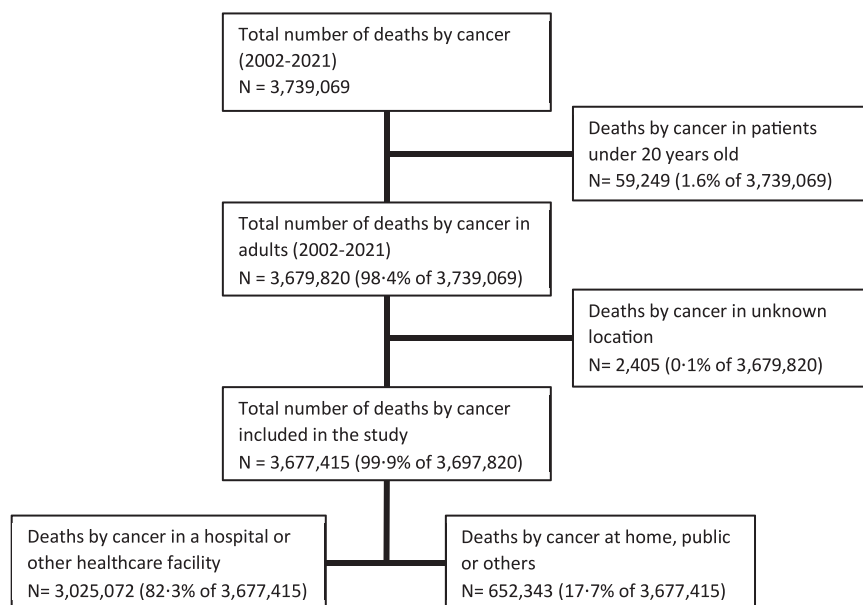

Fig. 2: Flow chart of study population.

a dramatic rise in the rate of home deaths, ranging from 15.9% (2018) to 20.3% (2021), (APC = +10.7%; 95% CI = +3.9 to +18.0; p-value < 0.001) (Fig. 3, Supplementary Table S2).

According to the findings presented in Table 1, individuals with no formal education had substantially higher rates of home deaths when compared to subgroups with ≥7 years of schooling (OR = 3.38; 95% CI = 3.35–3.41). Similarly, indigenous individuals had significantly higher rates of home deaths compared to other ethnic groups (OR = 2.19; 95% CI = 2.06–2.32). Furthermore, patients from the North, Northeast, and Central-West regions demonstrated significantly higher rates of home deaths when compared to patients from the South and Southeast regions (OR = 2.32; 95% CI = 2.31–2.33). Conversely, patients with haematological malignancies had significantly lower rates of home deaths in comparison to patients with gastrointestinal tumours (OR = 0.41; 95% CI = 0.40–0.41).

Discussion

This study addresses a critical gap in research by examining data on the place of death by cancer in Brazil, a country often overlooked in existing literature dominated by European and North American focus. Consequently, the trends and factors influencing the place of death by cancer in Brazil are not comprehensively understood. The main findings indicate that hospitals are the primary setting for place of death by cancer in Brazil, with fewer deaths occurring at home, displaying varying patterns over time. Herein, contributing factors to home deaths include low literacy rates, indigenous ethnicity, and residency in underdeveloped regions, highlighting considerable socio-demographic disparities. Given the absence of a well-coordinated national program to ensure dignified end-of-life care for patients with cancer in Brazil, these results objectively highlight home-based deaths in cancer care as a negative indicator of the country's public health system.

On the contrary, in developed nations with adequate healthcare support, dying at home may indicate better end-of-life care. In this context, a favourable passing encompasses various dimensions and is centred around providing a comforting transition that aligns with the preferences of the dying individual, thereby honouring the principle of self-determination.[1,22,23] The dying process is complex and subjective, influenced by factors such as social stigma, cultural norms, and personal experiences.[22] Extensive research has elucidated individuals' preferences regarding end-of-life care, showing that a significant proportion, ranging from 49% to 100% of surveyed participants, express a desire to receive care and pass away in their own homes.[4,8,24–27]

All: 1 Joinpoint

Legend:
- ■ Observed
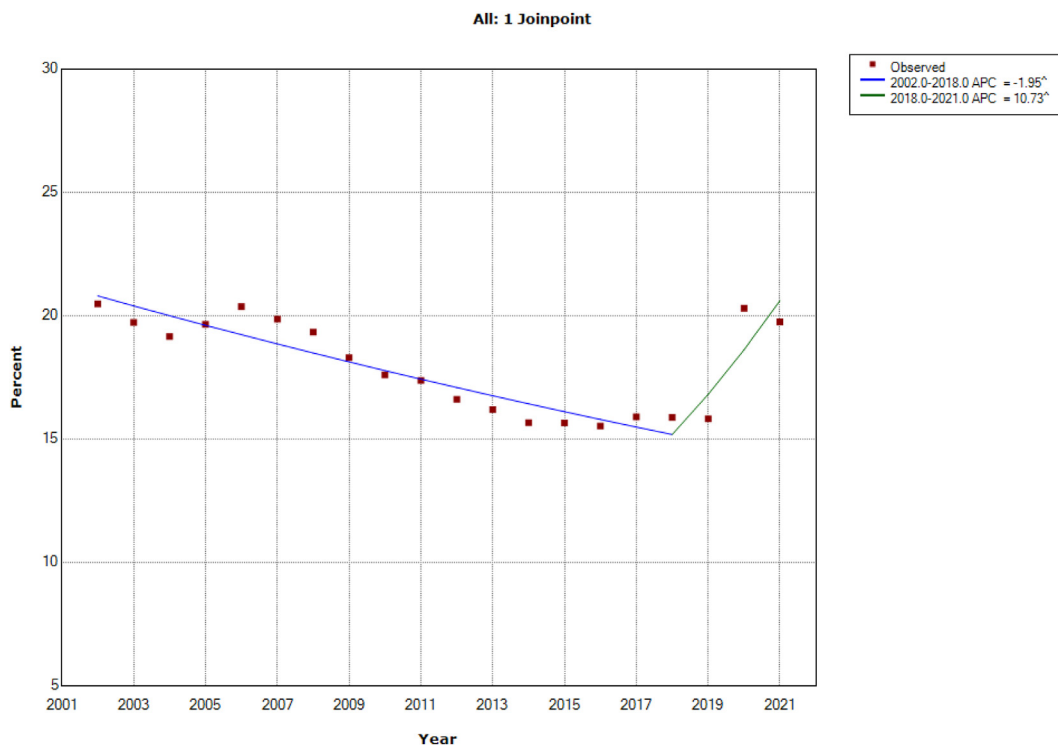- — 2002.0–2018.0 APC = −1.95^
- — 2018.0–2021.0 APC = 10.73^

Fig. 3: Temporal trends of home deaths by cancer in Brazil (2002–2021). APC = annual percent change. *Indicates that the APC is statistically significant with an alpha error of 0.05.

Variables	Place of death				OR (95% CI)	p-value
	Home[a] N (%)		Hospital[b] N (%)			
Period						
2012–2021	358,451	(16.8)	1,778,712	(83.2)	Ref.	..
2002–2011	293,892	(19.1)	1,246,360	(80.9)	1.17 (1.16–1.18)	<0.001
Sex						
Female	284,573	(16.5)	1,439,930	(83.5)	Ref.	..
Male	367,740	(18.8)	1,584,942	(81.2)	1.17 (1.17–1.18)	<0.001
Schooling (years)						
≥8	99,024	(12.3)	707,027	(87.7)	Ref.	..
1–7	277,714	(17.7)	1,289,088	(82.3)	1.54 (1.53–1.55)	<0.001
No formal education	146,723	(32.1)	310,210	(67.9)	3.38 (3.35–3.41)	<0.001
Age group (years)						
<60	150,391	(13.0)	1,003,504	(87.0)	Ref.	..
≥60	501,952	(19.9)	2,021,568	(80.1)	1.66 (1.65–1.67)	<0.001
Race/ethnicity						
White	352,465	(16.1)	1,833,210	(83.9)	Ref.	..
Yellow	4261	(17.0)	20,877	(83.0)	1.06 (1.03–1.10)	<0.001
Black and mixed race	265,712	(20.6)	1,022,755	(79.4)	1.35 (1.34–1.36)	<0.001
Indigenous	1543	(29.6)	3664	(70.4)	2.19 (2.06–2.32)	<0.001
Marital status[c]						
With partner	291,010	(17.2)	1,397,351	(82.8)	Ref.	..
Without partner	328,956	(18.4)	1,454,012	(81.6)	1.09 (1.08–1.09)	<0.001
Geographic region						
Southeast and South	340,993	(13.6)	2,170,965	(86.4)	Ref.	..
North, Northeast and Central-West	311,350	(26.7)	854,107	(73.3)	2.32 (2.31–2.33)	<0.001
Tumour primary site[d]						
Digestive organs	202,403	(17.1)	983,260	(82.9)	Ref.	..
Respiratory and intrathoracic organs	97,004	(17.3)	462,163	(82.7)	1.02 (1.01–1.03)	<0.001
Breast	42,175	(15.3)	232,771	(84.7)	0.88 (0.87–0.89)	<0.001
Female genital organs	42,977	(17.2)	206,975	(82.8)	1.01 (1.00–1.02)	0.14
Male genital organs	76,719	(28.1)	196,452	(71.9)	1.90 (1.88–1.92)	<0.001
Lymphoid, hematopoietic and related tissue	18,588	(7.7)	221,691	(92.3)	0.41 (0.40–0.41)	<0.001
Eye, brain, and other parts of central nervous system	23,263	(15.8)	123,830	(84.2)	0.91 (0.90–0.93)	<0.001
Lip, oral cavity and pharynx	33,361	(24.3)	104,005	(75.7)	1.56 (1.54–1.58)	<0.001
Urinary tract	18,419	(14.7)	106,666	(85.3)	0.84 (0.83–0.85)	<0.001
Undefined, secondary and unspecified sites	52,669	(20.4)	205,001	(79.6)	1.25 (1.23–1.26)	<0.001
Melanoma and other malignant neoplasms of skin	17,161	(26.4)	47,949	(73.6)	1.74 (1.71–1.77)	<0.001
Mesothelial and soft tissue	5448	(12.5)	38,242	(87.5)	0.69 (0.67–0.71)	<0.001
Others	22,156	(18.7)	96,067	(81.3)	1.12 (1.10–1.14)	<0.001
Total	652,343	(17.7)	3,025,072	(82.3)	–	–

CI, confidence interval; OR, odds ratio. [a]Home = occurred at home, in a public place or others. [b]Hospital = occurred in a hospital or other healthcare establishment. [c]With partner = married or in a stable union. Without partner = widowed, divorced, or single, or missing information. [d]Digestive organs were chosen as a reference because it was the most frequent tumour site.

Table 1: Factors associated with home death by cancer in Brazil (2002–2021).

An important assessment, based on insights from 181 experts representing 81 countries, equivalent to over 80% of the global population, highlighted Brazil's ranking at 79th place in palliative care quality. This designation emphasizes Brazil as one of the least favourable locations for end-of-life care, only surpassing nations facing significant developmental challenges or strong socio-political crises like Lebanon (80th) and Paraguay (81st) on a global scale. In contrast, the top three countries were the United Kingdom (1st), Ireland (2nd), and Taiwan (3rd), all falling into the high-income nation classification.[28]

The identified rate of 17.7% of deaths occurring in residential settings within the current study is in line with previously reported findings.[7,29] It is important to note that the distribution of home deaths varies

significantly across countries, influenced by factors such as disparities in resources, varying stages of palliative care development, and nation-specific regulations concerning end-of-life care.[30] Reflecting the national reality of insufficiently integrated end-of-life care programs, the high frequency of home deaths reported in underdeveloped countries is concerning. For instance, Seitz et al.[31] studied 12 Latin American countries and found varying rates of cancer-related deaths at home, with Guatemala reaching an alarming 80.3% for home deaths. In another analysis of death certificates from 14 countries, Mexico recorded 57% of deaths occurring at home.[30] Similarly, a study in Africa reported that the majority of cancer-related deaths (42.9%) took place in residential settings.[32]

Brant and Silbermann[33] underscored the vulnerabilities stemming from economic disparities that significantly affect the quality of end-of-life care for cancer patients in low- and middle-income countries (LMICs), aligning with Soto-Perez-de-Celis et al.[34] on challenges in end-of-life care in Latin America and insights from Murray et al.[35] on cancer patient care in Kenya. The documented resource constraints, inadequate healthcare infrastructure, and underfunded programs pose obstacles to comprehensive palliative services, impacting place of death, pain management and psychosocial support. The economic gap not only widens care access discrepancies but also jeopardizes standards, potentially compromising pain control and psychosocial assistance. As studies suggest the viability of cost-effective palliative care models, they collectively emphasise the urgency for enhanced legislative frameworks, better infrastructure, and culturally sensitive practices to navigate the intricate challenges faced by patients in LMICs like Kenya and Latin American nations.

The study reveals a consistent annual decrease of 1.9% in the rate of cancer deaths at home from 2002 to 2018, corresponding with the findings from the research conducted in the state of Paraná which showcased a decline in home deaths between 1996 and 2010.[29] In their study, Leite et al.[36] noted a significant reduction in the proportion of elderly individuals with cancer who passed away at home in the state of São Paulo–the percentage decreased from 10.3% in 2006 to 8.1% in 2012, indicating a notable shift. These collective results point towards a positive trend away from home deaths for cancer patients, suggesting potential improvements in end-of-life care practices within these regions, supposedly taking place in hospital settings.

Nevertheless, there was a significant surge of 10.7% in the rate of home deaths in Brazil between 2018 and 2021. The COVID-19 pandemic, declared by the World Health Organization on March 11, 2020, associated with the collapse of medical services, may have strongly contributed to this change. Furthermore, the implementation of social isolation measures combined with the reorganization of healthcare services to prioritize

patients suspected or confirmed with COVID-19 may have created barriers to hospital access for cancer patients nearing the end of life.[37] Results of a recent study conducted by Teasdale et al.[38] in the USA demonstrated that, at the onset of the COVID-19 pandemic, there was an 11% increase in the general hospital death (relative risk—RR = 1.11; 95% CI = 1.05–1.17), with non–COVID-19 in-hospital death decreasing by 13% (RR = 0.87; 95% CI = 0.82–0.93), and a 19% increase in non–COVID-19 home deaths (RR = 1.19; 95% CI = 1.13–1.26).

In the current study, a robust association was identified between deaths occurring at home and specific sociodemographic characteristics, namely no formal education (OR = 3.38, p-value < 0.001), indigenous ethnicity (OR = 2.19, p-value < 0.001), and residence in the North, Northeast, and Central-West regions of the country (OR = 2.32, p-value < 0.001). These results are consistent with the comprehensive analysis conducted by Seitz et al.,[31] where the likelihood of home deaths, regardless of the underlying cause (beyond cancer-specific cases), consistently increased with advancing age, rural residency, and lower educational attainment. Moreover, an observed moderate negative correlation surfaced between the regional proportion of home deaths and the availability of hospital beds. Altogether, this suggests that individuals with greater financial means and social support in Latin American contexts tend to have enhanced access to hospital-based care.[31]

In 2022, there was a notable 22.5% rise in the overall count of palliative care services in Brazil when compared to the figures from 2018. Nonetheless, with only 234 services currently operational, it is evident that this number remains inadequate for the country's population (equating to approximately 2 services per 100,000 inhabitants).[39] Furthermore, these services are geographically disparate, with approximately 60% concentrated in the South and Southeast regions. Additionally, only 83 of these services (35.4%) offer home care facilities.[40] The impending implementation of the National Palliative Care Policy within the Brazilian Public Health System, which has received approval in various forums and is currently undergoing final review in the technical departments of the Ministry of Health for imminent publication, holds promise for effectively addressing this situation.

Limitations and strengths

Some limitations need to be addressed. Firstly, the extent of death registration coverage in the country and the completeness of the investigation of the cases of the records used in this study, as SIM is a secondary database, should be taken into consideration. Despite ongoing efforts by the Ministry of Health to enhance data completeness and SIM coverage,[41] under-registration persists in certain regions, particularly in the North and Northeast.[14,42] Additionally, the outcome

examined in this study cannot be easily translated into the quality of death. A more comprehensive assessment of death quality would ideally involve evaluating various factors such as physical and psychological symptoms, personal care, spirituality, relationships, preparation for death circumstances, and the choice of end-of-life care and location of death.[1,9,22,43] Investigating the association between the availability of palliative care services at home and the probability of home deaths in Brazil would be an intriguing area for study. However, the lack of a national database with accurate regional data on services of palliative care at home made such analyses unfeasible.

When analysing extensive datasets such as the one in this study, there is an increased likelihood of identifying statistically significant results that may not correspond to clinically meaningful associations.[44,45] In this context, evaluating effect size should be used to determine the clinical importance of the results. As such, the data analysis was conducted by taking into account effect size, which, unlike the p-value, is not influenced by sample size.[46] Notably, owing to the cross-sectional design employed, the identified associations between variables might have exhibited variations across different time periods. Ultimately, the data format used did not support an adjusted analysis because disaggregated data, which was unavailable on the on-line data collected, is essential for this type of multivariate analysis.

It is crucial to highlight that this study represents one of the most comprehensive investigations concerning the place of death in Latin America, utilizing a robust and credible dataset. The research draws upon data from a reputable source of sociodemographic information, offering a detailed time series dataset for thorough analysis. To guarantee data accuracy and relevance, the study implemented stringent inclusion and exclusion criteria. Furthermore, various advanced statistical analysis techniques were applied to the data, enriching the reliability and validity of the study's outcomes.

Future perspectives

This research aims to unveil the intricate dynamics at play and advocates for educational institutions and researchers to delve deeper into this crucial area using diverse methodological approaches, thereby enriching the comprehension of end-of-life care quality. The study is anticipated to prompt governmental bodies into action, facilitating the formation of strategic solutions and public policies for the efficient allocation of resources towards end-of-life care. Special attention must be directed towards supporting marginalized groups, including Black and Indigenous communities, individuals with limited educational backgrounds, and residents in underserved regions. Alongside upholding investments in continuous medical education initiatives

to ensure meticulous death certificate completion, targeted research focusing on disadvantaged populations is deemed imperative. Embracing this evidence-driven strategy to tackle prevailing challenges has the potential to cultivate a more equitable and compassionate healthcare system.

Conclusion

The study underscores the concerning rate of cancer deaths occurring at home in Brazil, shedding light on the absence of a well-organized national end-of-life care program for home settings, as well as structured palliative care teams in more underdeveloped regions. This deficiency potentially compromises the quality of care and support for individuals in their terminal stages. To address this issue, there is a pressing need for a coordinated national program that prioritizes dignified end-of-life care at home for cancer patients. Implementing targeted strategies focused on enhancing home-based care services, facilitating improved access to medical resources, and providing support to vulnerable populations can significantly bolster the quality of end-of-life care. Such a program has the potential to foster a more compassionate and efficient healthcare system, especially for individuals grappling with end-of-life challenges in Brazil.

solely reflect those of the authors and should not be interpreted as official positions endorsed by government entities.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.lana.2024.100764.

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