

Mortality due to neoplasms in Brazil from 2014 to 2023

Abstract

Introduction: Neoplasms are a group of cells that share a single origin and whose accumulated alterations in their genetic material confer a competitive advantage for their survival and disordered multiplication. They represent the second leading documented cause of death worldwide.

Objective: To study the epidemiological profile of mortality from neoplasms in Brazil from 2014 to 2023.

Methodology: An exploratory, observational, descriptive, cross-sectional, epidemiological study was carried out with secondary data extracted from the Mortality Information System (SIM), through TABNET/DATASUS - Brazilian Ministry of Health, on mortality from neoplasms in Brazil in one decade, from the time series (2014 to 2023). The data were tabulated in Excel and analyzed in Bioestat 5.3. The results are presented in frequencies, mean, standard deviation and coefficient of variation.

Results: There were $n = 2,276,158$ deaths from neoplasms in Brazil in this decade. The year 2023 had the highest number of deaths ($n=255,037$). The most affected region was the Southeast (47%), followed by the Northeast (22%). Males were more frequently affected. The most affected age group was 60-69 years. Married status predominated. The lowest number of deaths was 12 years or more of education, with $n=203,051$. Malignant neoplasms accounted for 98% of deaths. The most frequent location of occurrence was the hospital (79%), followed by home (16%).

Final considerations: Malignant neoplasms require epidemiological monitoring and improved public health actions to be expanded within the Brazilian Unified Health System, as they are the cause of many deaths. The epidemiological profile mentioned as most frequent requires the implementation of monitoring, prevention, and control measures, which should be expanded to other population groups, to reduce deaths and improve public health in our country.

Keywords: neoplasms, epidemiology, mortality, public health

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Introduction

Neoplasms are a group of cells of common origin whose accumulated alterations in their genetic material confer a competitive advantage for their survival and disordered multiplication. When growth occurs, it interferes with the surrounding environment, the stroma, and in some cases, can invade nearby tissues and spread to other parts of the body, a characteristic that confers malignancy.¹

They are listed in the International Classification of Diseases (ICD-10) in its second chapter and comprise codes C00-D48: C00-C97 include malignant neoplasms, D00-D09 include neoplasms in situ, D10-D36 benign neoplasms, and D37-D48 neoplasms of uncertain or unknown behavior.²

The second leading documented cause of death worldwide is cancer. There were more than 9.7 million deaths due to complications from neoplasms in 2022. The forms with the highest number of deaths are lung, colorectal, liver, and breast cancers.³ Although their initial sites or histological presentations may vary, many of them share common risk factors such as genetic predisposition, age, smoking, a sedentary lifestyle, obesity, and alcoholism.¹ These factors are mostly modifiable or indicate the need for early monitoring to ensure a better prognosis.^{4,5}

During the same period, 278,835 deaths were attributed to neoplasms in Brazil.³ Furthermore, it is estimated that the incidence

of cancer in the country will increase in the coming years, following a trend observed in developing countries due to improved quality of life due to the adoption of harmful lifestyle habits.⁶

Given this scenario, it was considered crucial to analyze the epidemiological profile of cancer mortality in Brazil over the last decade. This study aims to provide a detailed presentation of the cancer mortality rate in Brazil, serving as a theoretical foundation for formulating assertive prevention and appropriate screening strategies for this group of pathologies based on the epidemiological data presented.

Methodology

This article is an exploratory, observational, descriptive, cross-sectional, epidemiological, and ecological study of neoplasm mortality in Brazil over a decade, covering the period from 2014 to 2023.

The data used were secondary data from the SUS Information System via TABNET-DATASUS, the Mortality Information System (SIM), vital statistics, and overall mortality in Brazil by place of residence. Data on the following variables were extracted from the system: region, year, ICD-10-chapter II, age group, sex, race/ethnicity, education, marital status, place of occurrence, and ICD-10 group.

After data extraction from SIM, the data were exported to Excel for tabulation and graphing and later exported to the Bioestat 5.3

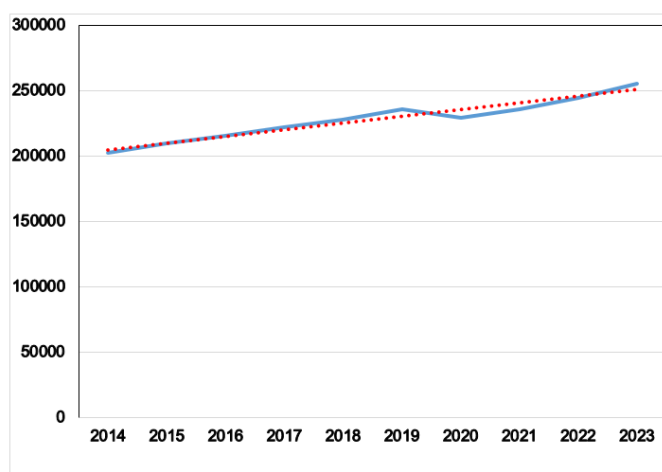
statistical program, where descriptive statistics were performed. The results are expressed in absolute numbers and frequencies, means, standard deviations, and coefficients of variation (CV) and presented in graphs and tables.

This study, being an epidemiological study using secondary data from an official, public database, presents limitations inherent to this type of data, such as the possibility of underreporting and data limitations regarding exclusive access to the variables exposed in the database, which prevents us from tracing causal networks. On the other hand, this same study design has significant advantages, as it allows access to data from the entire population, provides results that allow us to generate hypotheses, and can support the foundation of robust public policies targeting the most affected population. The possibility of underreporting is a subtle limitation, given the sample size is based on a large population, thus significantly diluting any potential bias related to sample size.

Regarding ethical aspects, it is important to highlight that this study does not require submission to/approval of a Research Ethics Committee, as it uses secondary data available in open access in the official health database of the Brazilian Ministry of Health, with population data that does not allow individual identification. This guarantees the privacy required by research ethics and is therefore in accordance with the legal and regulatory standards for health research, as per Law 14.874/24, which regulates research involving human beings in Brazil (Brazil, 2024),⁷ the Nuremberg Code.⁸

Results

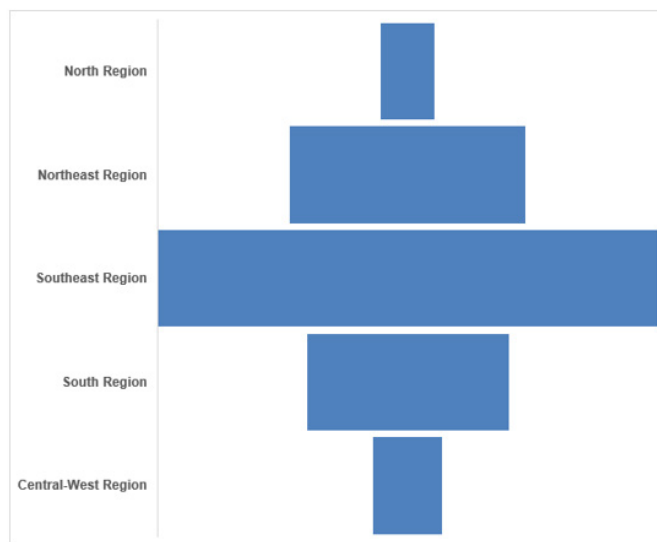
In the last decade, in Brazil, there were $n=2276158$ deaths from neoplasms. The distribution of these deaths by year (Graph 1) showed a continuous increasing trend (except in 2020), with some points of oscillation, the years 2014 and 2023 were above the trend line and the period from 2020 to 2021 below the trend line, with the highest peak in 2023. Following the distribution by year, the following numbers of deaths were observed: 2014 ($n = 201968$), 2015 ($n = 209780$), 2016 ($n = 215217$), 2017 ($n = 221821$), 2018 ($n = 227920$), 2019 ($n = 235301$), 2020 ($n = 229300$), 2021 ($n = 235805$), 2022 ($n = 244009$), 2023 ($n = 255037$). The average number of deaths in the period was $m = 227615.8 (\pm 16031.04)$ and Coefficient of Variation (CV) = 7.04%.



Graph 1 Distribution of deaths from neoplasms in Brazil, by year, from 2014 to 2023.

Source: Prepared by the authors, with data from MS/SVS/CGIAE - Mortality Information System – SIM, TABNET/DATASUS, 2025.

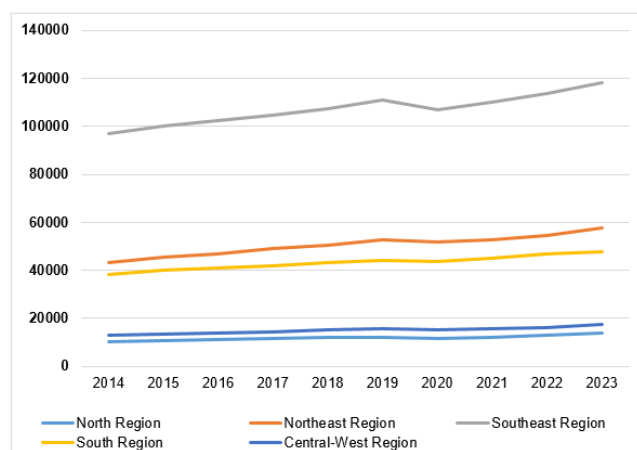
The distribution of the results of deaths due to neoplasia in Brazil by region (Graph 2) shows that the Southeast region had the majority of deaths with $n=1071006$ deaths equivalent to 47% of deaths in the Brazilian national territory in the decade under study; followed by the Northeast region with $n=505291$, equivalent to 22%; the South region with $n=431910$, with 19%; the Central-West region with $n=150214$ with 7% and the North region with 5%.



Graph 2 Distribution of deaths from neoplasms in Brazil, by region, from 2014 to 2023.

Source: Prepared by the authors, with data from MS/SVS/CGIAE - Mortality Information System – SIM, TABNET/DATASUS, 2025.

Regarding the distribution of deaths from neoplasms by region/year (Graph 3), it was observed that there was a certain stability in the distribution of deaths from neoplasms in the Brazilian regions. In the decade studied, in the Southeast region average= $107100.60 (\pm 6435.52)$ and $CV=6.01\%$; Northeast region average= $50529.10 (\pm 4346.50)$ and $CV=8.60\%$; South region average= $43191.00 (\pm 2926.00)$ and $CV=6.77\%$; Central-West region average= $15021.40 (\pm 1284.57)$ and $CV=8.55\%$ and North region average= $11773.70 (\pm 1093.53)$ and $CV=9.29\%$.



Graph 3 Distribution of deaths from neoplasms in Brazil, by region/year, from 2014 to 2023.

Source: Prepared by the authors, with data from MS/SVS/CGIAE - Mortality Information System – SIM, TABNET/DATASUS, 2025.

Table 1 shows the results by sex, age group, race/ethnicity, marital status, and education of deaths from neoplasms distributed by region and total number for Brazil. Regarding sex, deaths predominated among males in all regions of Brazil. The most affected age group in Brazil was 60-69 years old. However, an increase in these deaths was observed from the ages of 30-39, but with an exponential increase from the ages of 40-49. There was variation in the most predominant age group in the Northeast and South regions, where the age group above 70-79 years predominated.

Regarding race, deaths were more frequent in Brazil among white people, but in the North and Northeast regions, the most affected race was brown. The most affected marital status was married, in Brazil and in all regions and the education level of 1 to 3 years of study predominated in Brazil, but, in the South and Central-West regions, the education level in which deaths from neoplasms predominated was 4 to 7 years of study, highlighting that the education level of 12 years and more was the one that had the least deaths from neoplasms in Brazil (Table 1).

Table 1 Distribution of deaths from neoplasms in Brazil, by region, sex, age group, color/race, marital status and education level, from 2014 to 2023

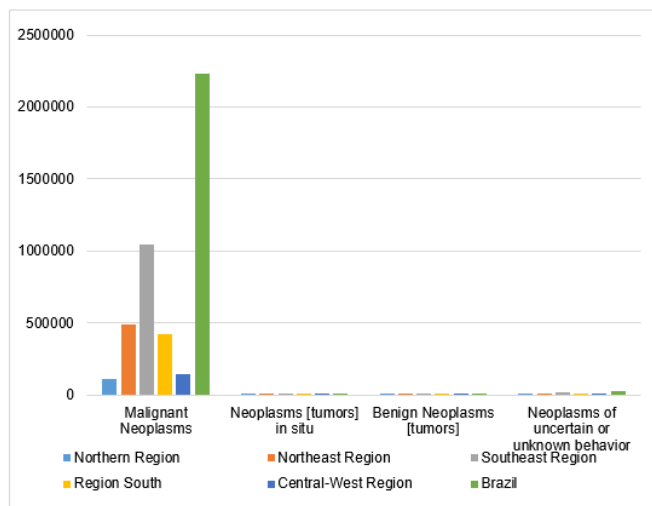
Region	North	Northeast	Southeast	South	Central-West	Brazil
Sex						
Male	61759	256189	557075	235252	80266	1190541
Female	55969	249080	513844	196637	69926	1085456
Ign	9	22	87	21	22	161
Age range						
Under 1 year	181	411	418	153	102	1265
1 to 4 years	659	1585	1890	660	446	5240
5 to 9 years	736	1741	1947	784	464	5672
10 to 14 years	663	1785	2162	765	471	5846
15 to 19 years	931	2428	3119	1100	645	8223
20 to 29 years	2584	7313	10873	4218	2076	27064
30 to 39 years	5985	18472	29180	10750	5460	69847
40 to 49 years	12152	42358	73443	27744	12843	168540
50 to 59 years	20259	82997	176844	70730	26437	377267
60 to 69 years	27846	116790	278482	113125	37056	573299
70 to 79 years	26257	121929	265319	113440	36196	563141
80 years and older	19466	107427	227163	88431	28003	470490
Age unknown	18	55	166	10	15	264
Color/Race						
White	27127	142608	677843	368647	69817	1286042
Black	6666	41908	93693	17719	10474	170460
Yellow	453	1603	10267	1802	962	15087
Mixed-race	80099	299635	259015	33579	65213	737541
Indigenous	1384	1065	595	408	586	4038
Ignored	2008	18472	29593	9755	3162	62990
Marital Status						
Single	33028	128220	207904	68626	31898	469676
Married	43971	200950	459693	195110	60147	959871
Widowed	17526	89257	221283	91377	27096	446539
Legally Separated	5739	24558	102814	36799	14818	184728
Other	10306	22289	25238	13721	6428	77982
Unknown	7167	40017	54074	26277	9827	137362
Education						
None	22863	114157	82836	32887	21268	274011
1 to 3 years	26092	115014	241450	92894	29139	504589
4 to 7 years	24870	81171	230777	121063	34120	492001
8 to 11 years	23929	74713	222534	85221	29697	436094
12 years and older	8361	31697	115305	33172	14516	203051
Unknown	11622	88539	178104	66673	21474	366412

Source: Prepared by the authors, with data from MS/SVS/CGIAE - Mortality Information System – SIM, TABNET/DATASUS, 2025.

Deaths from neoplasms in Brazil, according to the ICD-10 Group (Graph 4), demonstrate a predominance of malignant neoplasms, with n=2,232,299, representing 98% of deaths. Second, deaths occurred in the ICD-10 group of neoplasms of uncertain or unknown behavior,

with n=32,401, representing 2%. Next came benign neoplasms (tumors), with n=8,053, representing approximately 0%, and in situ neoplasms (tumors) with n=3,405, representing 0%.

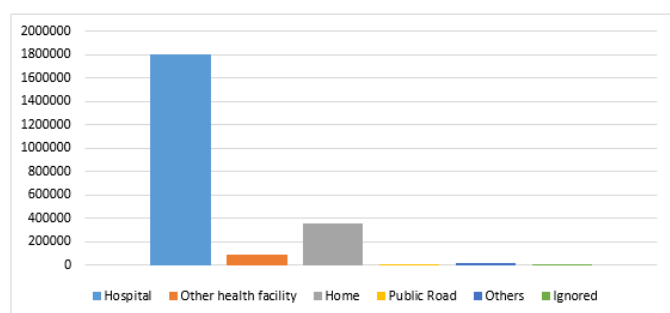
The distribution of neoplasms by region and ICD-10 group was as follows: malignant neoplasms: North (n=114,675); Northeast (n=494,475); Southeast (1049,218); South (n=426,225); and Midwest (n=147,706). Neoplasms (tumors) in situ: North (444); Northeast (n=1358); Southeast (n=1185); South (n=292) and Midwest (n=126). Benign neoplasms (tumors): North (n=530); Northeast (n=2170); Southeast (n=3799); South (n=946); Midwest (n=608). Neoplasms of uncertain or unknown behavior: North (n=2088); Northeast (n=7288); Southeast (n=16804); South (n=4447); Midwest (n=1774) (Graph 4).



Graph 4 Distribution of deaths from neoplasms in Brazil, by region/year, from 2014 to 2023.

Source: Prepared by the authors, with data from MS/SVS/CGIAE - Mortality Information System – SIM, TABNET/DATASUS, 2025.

Regarding the place of occurrence (Graph 5), the majority of deaths from neoplasms occurred in hospital (n=1803936), equivalent to 79%; followed by home (n=359806), equivalent to 16%; other health establishment (n=90925), equivalent to 4%; others (n=18005), equivalent to approximately 0.8%; public road (n=2991), equivalent to 0.13% and unknown (n=495), also equivalent to approximately 0.02%.



Graph 5 Distribution of deaths from neoplasms in Brazil, by Place of Occurrence, from 2014 to 2023.

Source: Prepared by the authors, with data from MS/SVS/CGIAE - Mortality Information System – SIM, TABNET/DATASUS, 2025.

Discussion

The survey presented reveals an uninterrupted upward trend in deaths from neoplasms in Brazil between 2014 and 2023, peaking in 2023 and briefly fluctuating in 2020. During this period, n=2.276.158 deaths were recorded, with an annual average of 22.761,58. This trend

parallels the rising incidence of the disease in developing countries—a direct consequence of the epidemiological transition, improved living conditions, and the adoption of unhealthy habits.^{9,10,11}

The reduction in the number of notifications in 2020 can be explained by the adoption of health policies in Brazil that prioritized diagnostic tests for COVID-19 over non-urgent tests, such as screening tests.¹² Furthermore, there was a reduction in the number of hospitalizations due to chronic diseases during the same period, and the adoption of telemedicine as an alternative to in-person consultations.^{13,14} However, telemedicine has limitations regarding the performance of physical examinations, which makes the diagnosis of some cancers difficult. This scenario contributed to underreporting of cases, which likely led to a worsening of patient prognosis due to delayed diagnosis and treatment.^{15,16}

The National Cancer Institute (INCA) forecast confirms this trend: an estimated 704.000 new cancer cases are expected in the 2023-2025 triennium. Among older Brazilians, the pattern is clear: cancer mortality increased in all states between 2011 and 2020, an expected result given the increase in longevity and the interaction with socioeconomic determinants.^{9,17} Although some parts of the country maintain stable rates, other regions are expected to experience growth by 2030 due to population aging and demographic expansion, especially in less-privileged areas.¹⁸

This scenario is strongly anchored in the Westernization of lifestyles and sociodemographic transformations. Smoking persists, obesity is on the rise, sedentary lifestyles are becoming widespread, and alcohol remains a prominent risk factor—all modifiable and directly related to the cancer burden.^{19,20} Reversing this dynamic requires targeted actions: reducing risk factors, expanding vaccination coverage, timely screening and rapid access to diagnosis.²¹

According to data collected by PAHO,²² it is possible to compare the mortality rate per 100.000 inhabitants of all Latin American countries in 2021. In comparison, Brazil has a rate of 101.6, above the Latin American average of 95.4. However, it is below other Southern Cone countries such as Argentina (105.45) and Uruguay (158.8), despite having lower HDI and GINI indexes.²³ Statistics that divide the number of cancer deaths by the population alone cannot serve as a comparison between countries, since the age structure differs between each one. Therefore, countries with older populations tend to have more relative deaths, even though they have better accessibility to health services and a general quality of life due to their chronic aspect.²⁴⁻²⁶

Regional disparities are evident. The Southeast accounted for 47% of deaths from neoplasms in the last decade (1.071.006), followed by the Northeast (22% - 505.291), South (19% - 431.910), Central-West (7% - 150.214), and North (5%). The distribution has remained relatively constant over time but reveals profound structural inequalities. In the South and Southeast, where the HDI is higher, neoplasms associated with the urban-industrialized lifestyle, such as colorectal cancers, are prevalent. The North and Northeast, on the other hand, face accelerated growth and a higher incidence of cancers linked to poverty or infections, such as stomach and cervical cancers.^{20,27,28}

The Southeast region has the highest number of cancer deaths in Brazil, due to both unequal access to health services and educational attainment, as well as early diagnosis, which allows for greater identification of cases. The pattern in the Southeast region is similar to the cancer mortality profile in other countries and also reflects local needs and challenges inherent to the region. Cancerous mortality in

the Southeast region of Brazil reflects similar patterns observed in other parts of the world, but also points to specific local challenges. The death profile in older adults, over 60, also reflects a global trend, which indicates that population aging is a major factor in the global burden of cancer. Furthermore, the state of São Paulo has the highest number of deaths, which is possibly related to population density and environmental risk factors.²⁹

Disparities in access to healthcare exacerbate the problem. In the South and Southeast regions, the availability of consultations and oncology facilities is superior. Conversely, peripheral populations travel long distances for care, face long waits, and often arrive late for treatment. Racial and economic equity remains fragile. Black and low-income individuals have greater difficulty accessing services, experience delays in diagnosis, and face higher mortality rates.^{30–32} Furthermore, potential flaws in the quality of mortality data, including underreporting in less developed regions, compromise the true scale of the problem.³³

The sociodemographic profile of cancer deaths reinforces consistent trends. Men died more frequently in all regions. The 60–69 age group led the death toll, with a sharp increase after age 40. In the South and Northeast regions, however, deaths in the 70–79 age group predominated. Age, once again, emerges as a key variable: the older the age, the greater the likelihood of death from cancer—a direct reflection of accumulated exposure and the biological aging process.^{34,35} Cancers such as breast cancer, for example, are more common in women over 50, a result of hormonal changes and prolonged exposure to risk factors.¹⁰

The distribution by race/ethnicity shows a predominance of the White population nationwide, but in the North and Northeast regions, the majority of deaths were among people of mixed race. Racial inequality continues to profoundly affect oncology outcomes, even after adjusting for income and education.^{36,37} Black populations have more limited access to treatment, resulting in late diagnosis and a higher proportion of advanced-stage cases.³⁸

Regarding marital status, deaths were more frequent among married individuals. This higher incidence contrasts, as the presence of a spouse is associated with a higher incidence of death in a hospital setting, although there may be greater social support.^{39,40} Studies indicate that social isolation among single individuals can negatively impact treatment adherence. Emotional and family support remains a silent but influential variable in clinical outcomes.^{26,41}

Education defines a vulnerability profile. People with 1 to 3 years of schooling were the most affected, especially in the North, Northeast, and Southeast regions. In the South and Central-West regions, the group with 4 to 7 years of schooling prevailed. The lowest number of deaths was identified among those with 12 or more years of schooling. The association between low education and higher cancer mortality is robust, demonstrating that knowledge, access to information, and autonomy in health care play a decisive protective role.^{42–44}

Of all recorded deaths, 98% were due to malignant neoplasms. Benign neoplasms, in situ, or of uncertain behavior, together accounted for only 2%. The mortality rate is concentrated in invasive tumors—biologically aggressive, metastatic, and difficult to control in late stages.⁴⁵ Carcinomas in situ, on the other hand, are confined to the original tissue layer and have a high cure potential if treated early. Benign neoplasms are self-contained, grow slowly, and rarely pose a life-threatening threat.⁴⁶ The difference between the types reinforces the importance of strategies that prioritize early diagnosis and rapid access to treatment.⁴⁷

Regarding the place of death, 79% occurred in hospitals, 16% at home, 4% in other healthcare facilities, and the remainder in various or unspecified locations. The prevalence of hospital deaths reflects the current model of seeking intensive care in the advanced stages of the disease.⁴⁸ However, the significant proportion of home deaths reveals another side of the problem. Most of the people dying at home are men, people aged 70 or older, people of mixed race or Indigenous descent, those with low levels of education, and those without a partner.⁴⁹ The lack of support networks and the geographic limitation of specialized services directly impact the likelihood of dying in a hospital setting.⁵⁰

Brazilian culture, historically hospital-centric, has not yet consolidated a comprehensive palliative care policy. This care, when offered, allows for pain control, psychosocial support, and preservation of the terminally ill patient's dignity.^{51,52} INCA has been working to disseminate this model, but the lack of infrastructure, especially in remote areas, forces many patients to face the end of their lives with avoidable suffering. Prolonged travel, bed shortages, and disorganization in the oncology network contribute to less-than-ideal outcomes—both for those who leave and those who remain.⁵³

Public policies should focus on proactive interventions and expanded prevention. The new 2023 legislation, which established the National Program for Navigation of People with a Cancer Diagnosis, represents a paradigm shift by focusing on the patient, actively seeking to identify and remove barriers that hinder access to treatment. This model has already demonstrated effectiveness in international studies in increasing screening rates and improving patients' quality of life.^{54–56}

Strengthening prevention policies is also vital, since approximately 40% of cancer cases are considered preventable by addressing risk factors.⁵⁷ Finally, the effectiveness of all interventions depends on robust governance and the continuous improvement of information systems. The persistence of bottlenecks such as delays in diagnosis and the judicialization of health is a symptom of the lack of systemic coordination, making the improvement of cancer records and epidemiological surveillance crucial to guide the allocation of resources and combat inequities strategically.^{58–62}

Final considerations

Neoplasms are a major cause of death in Brazil, with malignant neoplasms accounting for most deaths from neoplasms in our country. The continued growth trend highlights the need for more effective prevention, diagnosis, and treatment of neoplasms, especially malignant neoplasms. Even though this trend applies to almost the entire world, it is important to understand how to reduce these deaths, given that diagnostic methods are expanding worldwide, and new treatments are being developed, and this should result in lower deaths and improved prognoses. Undoubtedly, improvements in education and health are necessary to promote health, to the point of raising awareness among the population about the factors that increase the risk of developing neoplasms and focusing on distancing preventable predisposing factors. In addition, it is important that health services anticipate preventive measures and early diagnosis, to ensure treatment in the initial, treatable phase of the disease, and in more advanced stages that they implement palliative treatments capable of improving the quality of life in the more advanced stages.

It is therefore suggested that improvements be made in the adoption of public policies that guarantee health education and allow for the prevention of preventable cases, greater diagnostic effectiveness and the institution of treatments earlier, aiming to reduce deaths.

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Conflicts of interest

The authors declare there is no conflict of interest.

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