

Epidemiological profile and temporal trend of hospitalizations for malignant skin neoplasms in Brazil between 2015 and 2025

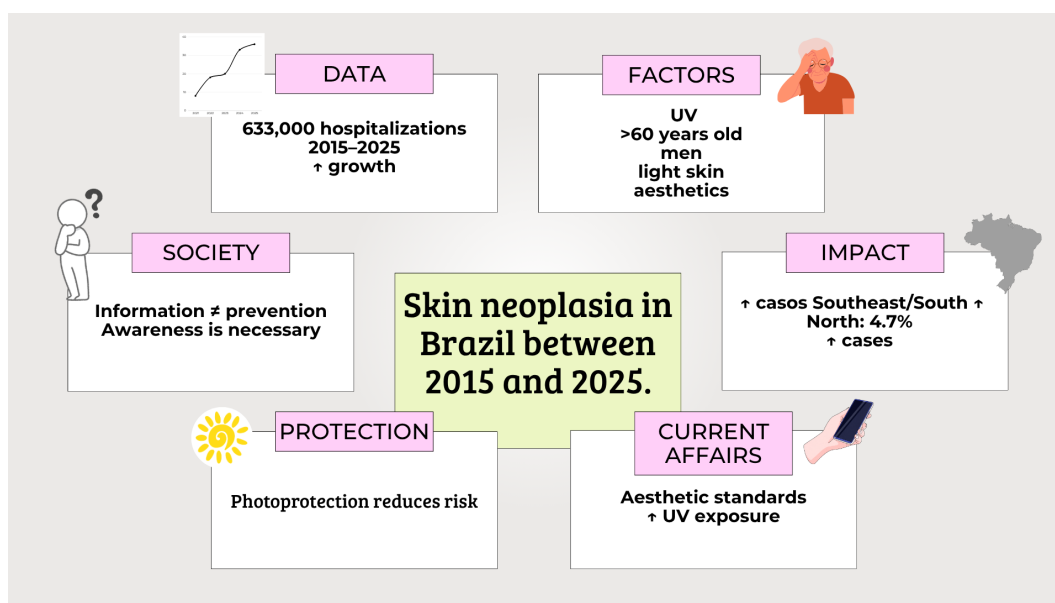
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Graphical Abstract

Highlights

- Rise in hospitalizations for skin cancer in Brazil between 2015 and 2025.
- Predominance of cases in the South and Southeast associated with light-colored phenotypes.
- The North region records the highest in-hospital mortality rate.
- Aesthetic standards and social media may influence risk sun exposure behavior.



Created by the author using the Canva platform (illustrative image). Accessed in May 2026.

Abstract

This study analyzed the epidemiological profile and temporal trend of hospitalizations for malignant skin neoplasms in Brazil between 2015 and 2025, based on secondary data from the Hospital Information System of the Unified Health System (SIH/SUS). A total of 633,457 hospitalizations were recorded during the period, with a predominance of male sex (51.9%), self-declared White individuals (65.8%), and the age group of 60 years or older (72.3%). The Southeast and South regions concentrated the highest number of hospitalizations, while the North region presented the highest mortality rate (4.70%). A general upward trend was observed throughout the historical series, with a reduction in 2020 and a progressive recovery in subsequent years. The findings indicate a higher occurrence of hospitalizations in groups more vulnerable to cumulative ultraviolet radiation exposure and evidence regional inequalities in access to diagnosis and treatment, reinforcing the need for prevention strategies, early diagnosis, and strengthening of public health policies.

Keywords: Skin Neoplasms. Epidemiology. Public Health. Ultraviolet Rays.

Associate Editor: Edison Barbieri
Mundo Saúde. 2026;50:e19952026
O Mundo da Saúde, São Paulo, SP, Brasil.
<https://revistamundodasaude.emnuvens.com.br>

Received: 20 march 2026.

Accepted: 22 july 2026.

Published: 17 august 2026.

INTRODUCTION

Skin cancer represents the most incident neoplasm worldwide and constitutes an important public health problem due to the high frequency of cases and the impact on health systems¹. Malignant skin neoplasms are classified into melanoma and non-melanoma skin cancer, a group that mainly includes basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). Although melanoma presents lower incidence, it stands out for its high metastatic potential and greater lethality. In contrast, non-melanoma carcinomas account for the majority of diagnoses and are responsible for significant demand for surgical procedures and hospital admissions².

In recent decades, national and international studies have demonstrated a progressive increase in the occurrence of these neoplasms, especially in aging populations and in regions with high solar radiation intensity³. This scenario results from the interaction of biological, environmental, and demographic factors, including advanced age, phenotypic characteristics, genetic predisposition, and cumulative exposure to ultraviolet (UV) radiation, recognized as the main environmental factor associated with the development of skin cancer⁴.

In addition to sun exposure arising from daily and occupational activities, the literature describes that artificial sources of UV radiation – such as tanning chambers – are also associated with an increased risk of melanoma and other cutaneous neoplasms, particularly when used at early ages⁵. Likewise, de-

vices employed in aesthetic procedures that use ultraviolet radiation have been investigated for their potential to promote cumulative cellular damage, although the evidence regarding their long-term effects remains limited⁶.

In parallel, different studies have discussed the influence of sociocultural factors on sun exposure habits. The valorization of tanning as an aesthetic standard, frequently reinforced by media outlets and digital platforms, may favor behaviors related to inadequate sun exposure. However, these associations derive from evidence described in the literature and do not allow the establishment of an isolated causal relationship with the occurrence of cutaneous neoplasms⁷.

In the Brazilian context, monitoring hospital admissions for malignant skin neoplasms constitutes an important tool for understanding the distribution of the disease and supporting health planning actions. Information made available by national systems enables the identification of temporal trends and regional differences, contributing to the targeting of prevention strategies, early diagnosis, and care organization.

Considering the high epidemiological burden of skin cancer in the country, the present study aimed to analyze the epidemiological profile and temporal trend of hospitalizations for malignant skin neoplasms in Brazil between 2015 and 2025, discussing the findings in light of the evidence available in the scientific literature.

METHODOLOGY

Study design

This is an ecological, descriptive, retrospective study with a quantitative approach, conducted through the analysis of secondary data from the Hospital Information System of the Unified Health System (SIH/SUS), made available by the Department of Informatics of the SUS (DATASUS), covering the period from 2015 to 2025⁸.

To support the discussion of results, a bibliographic search was conducted in March 2026, using scientific articles related to the epidemiology, risk factors, and prevention of malignant skin neoplasms.

Information selection

Records of hospitalizations classified according to codes C43.0 to C43.9 (malignant melanoma of the skin) and C44.0 to C44.9 (other malignant neoplasms of the skin) of the International Classification of Diseases, 10th revision (ICD-10)⁹ were included.

The variables analyzed comprised sex, age group, race/color, region of hospitalization, number of deaths, mortality rate, mean length of hospital stay, and hospital service costs.

For the death outcome, hospital mortality records were considered, occurring during hospital-

izations in which the primary diagnosis was coded as malignant skin neoplasm (C43.0 to C43.9 and C44.0 to C44.9). The system does not allow distinguishing whether the underlying cause of death was directly the neoplasm or other associated conditions, which is why mortality data must be interpreted with caution.

Data extraction

Data were extracted from DATASUS and orga-

nized in Microsoft Excel electronic spreadsheets. Subsequently, descriptive analysis was performed using absolute and relative frequencies and temporal distribution of hospitalizations, with results presented in tables and graphs.

The findings were interpreted based on the available scientific literature, without performing analyses aimed at establishing causal relationships between the described factors and the occurrence of hospitalizations.

Table 1 - Variables and categories used in data collection on hospitalizations for malignant skin neoplasm in Brazil, 2015–2025.

Variable	Categories	Description
Sex	Female; Male	Sex as declared by the individual.
Race/color	White; Black; Brown (mixed race); Yellow (East Asian); Indigenous; No information	Self-declaration according to the categories used in the information system.
Region	North; Northeast; Southeast; South; Center-West	Region of patient hospitalization.
Year of notification	2015 to 2025	Year of hospitalization record.
Age group	<20 years; 20–39 years; 40–59 years; 60–79 years; 80 years and over	Distribution of individuals into age groups.
Hospital service costs	Free text	Sum of the costs of hospital care and procedures.
Mean length of hospital stay	Free text	Mean time, in days, of hospital stay.
Number of deaths	Free text	Number of deaths recorded in the analyzed period or location.
Mortality rate	Free text	Ratio between the number of deaths and the total number of hospitalizations in the period.

Source: Developed by the authors based on variables extracted from SIH/SUS-DATASUS.

Use of artificial intelligence

Artificial intelligence tools were used exclusively to support grammatical review, textual organization, and the preparation of tables and graphs. All methodological decisions, analysis of results, interpretation of data, and formulation of conclusions were carried out entirely by the authors.

Ethical and legal aspects

Since it uses exclusively secondary, publicly available data with no individual identification of participants, the present study is exempt from review by a Research Ethics Committee, in accordance with Resolution No. 510 of April 7, 2016, of the National Health Council.

RESULTS

In the period from 2015 to 2025, a total of 633,457 hospital admissions for malignant skin neoplasm were recorded in Brazil. The distribution of these cases, presented in Table 2, evidences a predominance of male sex, individuals aged over 60 years, and self-declared White individuals, in addition to a significant concentration of hospitalizations in the Southeast and South regions. These findings point to an epidemiological profile marked by a higher occurrence of the disease in older populations and in regional contexts with greater registered care burden.

As also shown in Table 2, the 60–79 age group concentrated the highest proportion of hospitalizations, followed by the 80 years and over group, reinforcing the relationship between aging and higher frequency of hospital admissions for malignant skin neoplasms. The distribution by race/color also demonstrated a predominance of White individuals, with relevant participation of mixed-race individuals and the presence of records with no information, suggesting limitations in the completion of this variable in information systems.

Table 2 - Epidemiological profile of hospitalizations for malignant skin neoplasm in Brazil, 2015–2025.

Variable	n	%
Sex		
Male	329,129	51.9
Female	304,328	48.1
Age group		
<20 years	5,502	0.9
20–39 years	25,939	4.1
40–59 years	143,747	22.7
60–79 years	329,710	52.0
80 years and over	128,559	20.3
Race/color		
White	416,701	65.8
Black	8,580	1.4
Brown (mixed race)	164,910	26.0
Yellow (East Asian)	4,252	0.7
Indigenous	124	0.02
No information	38,890	6.1
Total	633,457	100.0

Source: Developed by the authors based on data from SIH/SUS-DATASUS.

Temporal analysis showed a general upward trend in hospitalizations throughout the historical series, interrupted only during 2020, with a progressive recovery in subsequent years, culminating in the highest values at the end of the analyzed period. This pattern suggests the influence of the pandemic context on access to health services and subsequent reorganization of care, with an expansion in case detection in the following years.

Data presented in Table 3 indicate that, although the Southeast and South regions concentrated the highest absolute numbers of deaths, the North region presented the highest mortality rate. This finding suggests that, despite a lower absolute volume of hospitalizations, the severity of outcomes may have been more pronounced in this region, possibly reflecting inequalities in access to early diagnosis and timely treatment.

Table 3 - Regional distribution of hospitalizations, deaths, and mortality rate for malignant skin neoplasm in Brazil, 2015–2025.

Region	Hospitalizations (n)	Deaths (n)	Mortality rate (%)
North	14,123	664	4.70
Northeast	115,189	2,077	1.80
Southeast	253,104	5,668	2.24
South	207,908	3,196	1.54
Center-West	43,133	689	1.60
Brazil	633,457	12,294	1.94

Source: Developed by the authors based on data from SIH/SUS-DATASUS.

Regarding deaths, the available data do not allow distinguishing whether the records resulted directly from the malignant skin neoplasm or from other causes associated during hospitalization. Therefore, the interpretation of these results must

consider the limitations inherent to the information system used, especially because mortality from basal cell carcinoma and squamous cell carcinoma is generally low, while melanoma presents a more aggressive clinical behavior and greater lethality

potential.

Furthermore, the mean length of hospital stay was short, suggesting that a significant proportion

of hospitalizations was associated with short-duration procedures, which is consistent with the expected care profile for this type of neoplasm.

DISCUSSION

The present study evidenced an upward trend in hospitalizations for malignant skin neoplasms in Brazil between 2015 and 2025, with a predominance of cases in male individuals, older adults, self-declared White individuals, and residents of the Southeast and South regions. These findings are consistent with the epidemiological profile described in the national and international literature, which demonstrates a progressive increase in the burden of these neoplasms in recent decades, especially in aging populations and in regions with higher ultraviolet radiation incidence¹⁰.

It is important to highlight that the analyzed data encompass hospitalizations related both to melanoma (ICD C43) and to other malignant skin neoplasms (ICD C44), including primarily basal cell and squamous cell carcinomas. These subtypes present distinct clinical characteristics regarding incidence, biological behavior, prognosis, and treatment¹¹. Since the database used does not allow the stratification of hospitalizations according to histological type, the results must be interpreted jointly, reflecting the overall epidemiological behavior of malignant skin neoplasms.

The higher concentration of hospitalizations in the Southeast and South regions may be attributed to different factors. In addition to concentrating a significant portion of the Brazilian population, these regions present a higher proportion of individuals with light skin phototypes, a characteristic recognized as a risk factor for the development of cutaneous neoplasms¹². Studies conducted in Brazil demonstrate that individuals with fair skin, light eyes, the presence of multiple nevi, and a history of sunburns present greater susceptibility to the development of these neoplasms¹³.

However, it is important to consider that regional differences may also reflect inequalities in the organization of the care network, in the availability of specialized services, and in diagnostic capacity. Therefore, the higher number of hospitalizations observed in the South and Southeast regions should not be interpreted exclusively as a higher occurrence of the disease, but also as a possible consequence of greater access to diagnosis and hospital treatment.

The predominance of hospitalizations among male individuals is also consistent with previous studies conducted in Brazil and other countries¹⁰.

Among the factors described in the literature, the greater male participation in occupational activities conducted outdoors stands out, with consequent cumulative exposure to ultraviolet radiation, in addition to lower adherence to photoprotection measures and to the use of preventive health services compared to women. It is noted, however, that these characteristics were not directly evaluated in the present study and constitute interpretations grounded in previously published evidence.

Regarding age group, a higher frequency of hospitalizations was observed among individuals aged 60 years or older. This result may be explained by the cumulative effect of ultraviolet radiation exposure throughout life, recognized as one of the main mechanisms involved in cutaneous carcinogenesis¹⁴. Aging also favors the accumulation of cellular alterations and the reduction of DNA repair capacity, factors that contribute to the development of these neoplasms.

The predominance of hospitalizations among self-declared White individuals – corresponding to 65.8% of records – is consistent with current knowledge regarding the biological susceptibility associated with lighter skin phototypes. The lower amount of melanin reduces natural protection against the effects of ultraviolet radiation, increasing the risk of DNA damage and, consequently, of skin cancer development¹⁵. However, it must be considered that differences in the demographic composition of Brazilian regions may also influence this distribution.

Temporal analysis revealed progressive growth in hospitalizations throughout the historical series, interrupted only during the most critical period of the COVID-19 pandemic. The reduction observed in 2020 probably does not represent a decrease in disease occurrence, but rather reflects the limitations imposed on access to health services, the temporary suspension of elective procedures, and the reduction of screening and diagnostic activities during the health emergency³. In subsequent years, a resumption of growth in hospitalizations was observed, accompanying the reorganization of hospital care and the recovery of diagnostic capacity.

Another relevant aspect concerns the regional distribution of mortality. Although the Southeast

and South regions concentrated a higher absolute number of deaths, the highest mortality rate was recorded in the North region. This finding may reflect inequalities in access to early diagnosis, specialized care, and timely treatment – factors frequently identified as determinants of regional differences in oncological outcomes. However, the design of this study does not allow the identification of the factors responsible for this difference, and specific studies are necessary to better understand this scenario.

Ultraviolet radiation exposure remains the main environmental factor associated with the development of malignant skin neoplasms, being widely documented in the scientific literature¹⁶. Both the intensity and cumulative nature of lifetime exposure contribute to molecular alterations capable of promoting cutaneous carcinogenesis. Therefore, photoprotection measures, early diagnosis, and health education remain fundamental strategies for reducing the burden of the disease.

In addition to natural sun exposure, studies demonstrate an association between the use of artificial tanning chambers and an increased risk of melanoma, especially when exposure occurs at younger ages¹⁷. The radiation emitted by these devices may reach levels higher than solar radiation under certain conditions of use, which is why various public health entities recommend their restriction or prohibition.

Other artificial sources of ultraviolet radiation – such as equipment used in aesthetic procedures – have also attracted interest from the scientific community. Although experimental studies suggest that repeated exposures may cause cumulative cellular damage, the evidence is still insufficient to establish their direct contribution to the occurrence of cutaneous neoplasms at the population level¹⁸. Therefore, further studies are needed to clarify the magnitude of this potential risk.

Another aspect frequently discussed in the literature concerns the influence of sociocultural factors on sun exposure habits. The valorization of tanning as an aesthetic standard, frequently reinforced by media outlets and digital platforms, may favor behaviors related to sun exposure without adequate protection¹³. However, the present study did not evaluate individual habits, social media use, or behaviors related to sun exposure. Therefore, such aspects are presented solely as elements described in the literature that may contribute to understanding the observed epidemiological context.

Although extensive information on skin cancer prevention is currently available, the continued

upward trend in hospitalizations demonstrates that the dissemination of knowledge alone may not be sufficient to promote sustainable changes in risk behaviors⁷. This scenario highlights the need for preventive strategies integrating health education, expanded access to photoprotection measures, strengthening of primary care, and campaigns directed at the most vulnerable population groups.

Another factor that may have contributed to the increase observed in the historical series concerns the improvement of health information systems and the expansion of access to diagnostic services¹⁶. The improvement in record quality and case identification capacity may influence the number of hospitalizations notified over the years, and this aspect must be considered in the interpretation of results.

Taken together, the findings reinforce the importance of continuous monitoring of malignant skin neoplasms through national information systems. The use of these data enables the identification of epidemiological trends, recognition of regional inequalities, and support for the planning of public policies aimed at early diagnosis, prevention, and organization of cancer care in Brazil.

Study limitations

The present study presents limitations inherent to the ecological design and to the use of secondary data from the SUS Hospital Information System (SIH/SUS). Initially, it is noted that the database encompasses only hospital admissions and does not allow estimating the total incidence of malignant skin neoplasms in the Brazilian population.

Another limitation concerns the impossibility of stratifying cases according to histological subtype. Although codes referring to both melanoma and other malignant skin neoplasms were included, it was not possible to separately analyze hospitalizations for basal cell carcinoma, squamous cell carcinoma, and melanoma – whose clinical, prognostic, and therapeutic behaviors are distinct.

Additionally, the database does not provide information on clinical variables such as tumor staging, disease extent, treatments performed, recurrence, or clinical evolution of patients. Nor does it encompass individual risk factors related to skin cancer development, such as occupational activity, sun exposure habits, use of photoprotection measures, family history, skin phototype, or use of artificial sources of ultraviolet radiation.

For this reason, discussions regarding environmental, occupational, behavioral, and sociocultural

al factors were grounded exclusively on evidence available in the scientific literature and used to contextualize the findings; it was not possible to establish causal relationships from the analyzed data.

Despite these limitations, the use of a nation-

ally comprehensive public database allowed characterization of the epidemiological profile of hospitalizations for malignant skin neoplasms over an eleven-year historical series, providing relevant information for planning surveillance, prevention, and cancer care organization strategies in Brazil.

CONCLUSION

The present study demonstrated an upward trend in hospitalizations for malignant skin neoplasms in Brazil between 2015 and 2025, evidencing higher frequency among male individuals, older adults, self-declared White individuals, and residents of the Southeast and South regions. Furthermore, it was observed that the North region presented the highest mortality rate, indicating possible inequalities in access to timely diagnosis and treatment.

The findings reinforce the importance of continuous epidemiological monitoring through national health information systems, as these data support the planning of public policies aimed at prevention, early diagnosis, and organization of cancer care. Considering population aging and the upward trend in hospital-

izations, it is necessary to strengthen health education actions, promote photoprotection, and expand access to specialized services, especially in regions with higher mortality indicators.

It is emphasized that the results of this study must be interpreted considering the limitations inherent to the use of secondary data and to the impossibility of stratification of different subtypes of malignant skin neoplasms. Therefore, future studies that allow separate analysis of melanoma, basal cell carcinoma, and squamous cell carcinoma, as well as the incorporation of clinical information and individual risk factors, may broaden the understanding of the epidemiological behavior of these diseases and contribute to the development of more targeted prevention and care strategies.

CRediT author statement

Conceptualization: Pinto, GOM. Methodology: Araújo, GC. Validation: Rodrigues, TA; Mariano, MPM. Statistical Analysis: Pinto, MOM; Silva, ACM. Formal Analysis: Pinto, MOM; Silva, ACM. Investigation: Pinto, GOM; Rodrigues, TA. Resources: Mariano, MPM. Writing – Original Draft: Pinto, GOM; Rodrigues, TA. Writing – Review & Editing: Silva, ACM; Araújo, GC. Visualization: Pinto, GOM; Pinto, MOM; Silva, ACM. Supervision: Araújo, GC. Project Administration: Pinto, GOM. Data Curation: Pinto, MOM; Mariano, MPM.

All authors have read and agreed to the published version of the manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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How to cite this article: Pinto, G.O.M., Pinto, M.O.M., Rodrigues, T.A., Mariano, M.P.M., Silva, A.C.M., Araújo, G.C. (2026). Epidemiological profile and temporal trend of hospitalizations for malignant skin neoplasms in Brazil between 2015 and 2025. *O Mundo Da Saúde*, 50. <https://doi.org/10.15343/0104-7809.202650e19952026>. *Mundo Saúde*. 2026,50:e19952026.