

# TEMPORAL TREND OF MORTALITY FROM CUTANEOUS MELANOMA FROM 2000 TO 2019 IN NORTHEAST BRAZIL

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**Abstract:** **Introduction:** Melanoma skin cancer (CPM) is a malignant tumor originating from melanocytes (cells that produce melanin, a substance that determines skin color) and is more frequent in white adults. Among skin carcinogens, ultraviolet radiation (UV) plays the main role. Early detection is the key to improved survival. Diagnosis is based on clinical suspicion, followed by histological confirmation. When metastases occur, whether regional or distant, the prognosis can be excellent or very poor, depending on the stage at which it was diagnosed; whether early or late. Most of the epidemiological reference on melanoma comes from studies carried out in countries with different sociodemographic and geographic characteristics, evidencing the scarcity of information in the northeast region of Brazil, in addition to the underreporting that the INCA itself recognizes. Based on the above, this study aims to analyze the temporal trend of melanoma skin cancer mortality in Northeast Brazil since 2000. **Methodology:** This is a descriptive epidemiological study, whose data were obtained by consulting the INCA online mortality atlas, which was accessed from January to March 2022. The study population consisted of all diagnosed melanoma cases and registered in the period from 2000 to 2019, in both genders, in the Brazilian Northeast. **Results:** There were 3,467 deaths from melanoma that were heterogeneously distributed between sex and age group. Of these, women accounted for 1,504 deaths, while men stood out with 1,963. Higher age groups represented a higher incidence of mortality. As for the temporal trend of mortality, there is an increase in cases with poor prognosis, with few periods of reduction, but with a gross rate higher than the adjusted rate for the world and lower than the adjusted rate for Brazil. **Conclusions:** there is a temporal trend towards an increase

in mortality from cutaneous melanoma in the Brazilian northeast region, especially in the elderly and male population. Despite this, the Northeast still maintains rates lower than those of Brazil, but higher than those of the world.

**Keywords:** Mortality, Melanoma, North East, Brazil.

## INTRODUCTION

Melanoma skin cancer (CPM) is a malignant tumor originating from melanocytes (cells that produce melanin, a substance that determines skin color) and is more frequent in white adults. In black individuals, it is more common in light areas such as the soles of the feet and palms. The primary cutaneous location is the most frequent, but they can appear in other areas of the body, such as the meninges and eyes.

These tumors are characterized by the possibility of causing metastases and high lethality. Among the risk factors for the emergence of melanoma, there are environmental and genetic ones. It is related to ultraviolet radiation, being the most important factor among Caucasians. In addition, the number of nevi, mainly atypical, mutations in the CDKN2A gene and influences of the immune system, mainly through nevogenesis and modification of the biological behavior of malignant lesions, are determining factors for their appearance.

Among skin carcinogens, ultraviolet radiation (UV) has the main role, contributing to immunosuppression by depleting Langerhans cells from the epidermis and stimulating the appearance of suppressor lymphocyte clones, thus, tumor growth is facilitated. UVR are type A (320 to 400 nm), B (290 to 320 nm) and C (200 to 290 nm), but only the first two cross the ionosphere and can produce harmful effects. The determination of the intensity of the sun's rays is related to the geographic location, latitude, exposure of areas of the body to the sun and occupation.

Most of the Brazilian territory lies between the equator and the Tropic of Capricorn, a fact that makes it the largest country in proximity to the Sun. Furthermore, because of the Earth's tilt of 23 degrees, most of it receives solar radiation at an angle close to 90 degrees to the horizon during the summer, making it a tropical country. In these, there is greater solar radiation and their population is more predisposed to the emergence of skin cancer. People with light skin and eyes are more likely to develop skin cancer and, with European colonization in Brazil, this population has a significant amount in the country.

According to Fitzpatrick (1976), the skin can be divided into six degrees, classified based on the ability of each type to tan, as well as sensitivity and redness when exposed to the sun, as shown in the table 1.

Melanoma can present changes in

Fototypes	Skin color	Tan	Burn	Sun sensitivity
I	White	It never gets tan	It always burns	Very sensitive
II	White	It gets tan very little	It always burns	Sensitive
III	Light brunette	It gets tan moderately	It burns moderately	Normal
IV	Moderate brunette	It always gets tan	It burns a little	Normal
V	Dark brunette	It always gets tan	It seldom burns	Low
VI	Black	Fully pigmented	It never burns	Absent

Table 1. Classification of Fitzpatrick.

pigmentation and asymmetrical growth of the lesion, sensation of itching, inflammation, ulceration and bleeding. It can arise from pre-existing injuries or from new injuries, "again". These usually arise from a slowly growing hyperchromic spot, sometimes only on the surface, but sometimes in depth, initially giving rise to a papule and later to a nodule. Typically, melanoma is divided into four clinical forms: lentigo maligna, superficial spreading, nodular and acral melanoma.

In general, superficial extensive melanoma represents 70% of cases, affecting more the trunk in males and lower limbs in females. The lesion evolves slowly, is usually associated with a previous lesion (atypical nevi) and has a diameter greater than 6 mm. Nodular melanoma represents 15% of cases, more common in fair-skinned people, affects the trunk, head and neck, any age group, has rapid evolution and the nodule is usually 1-2 cm, raised and gray. Acral melanoma is more common in dark-skinned people, usually affects the palmoplantar regions, has a slow evolution and macular lesion of 2-3 cm and is blackened. Lentigo affects 5% of light-skinned individuals, presents a slow evolution, is located on the face and neck and tends to appear more in the elderly.

Early detection is the key to improved survival. Diagnosis is based on clinical suspicion, followed by histological confirmation. When metastases occur, whether regional or distant, the prognosis can be excellent or very poor, depending on the stage at which it was diagnosed; whether early or late. Therefore, the importance of epidemiological knowledge, risk factors, patient interview and detailed physical examination are essential to obtain an early diagnosis.

In Brazil, skin cancer is the most frequent type of neoplasm and corresponds to about 30% of all malignant tumors recorded

in the country. Melanoma accounts for approximately 3% of malignant neoplasms of this organ, on the other hand, its low incidence is the most serious type, given its high rate of metastasis. According to INCA, the estimate for 2020 in Brazil was 8450 new cases, of which 4200 were men and 4250 were women and, according to the 2019 cancer mortality atlas (SIM), the mortality rate was 1978, with 1159 men and 819 women.

Most of the epidemiological reference on melanoma comes from studies carried out in countries with different sociodemographic and geographic characteristics, evidencing the scarcity of information in the northeast region of Brazil, in addition to the underreporting that the INCA itself recognizes. (MÉLO et al., 2019).

Based on the above, this study aims to analyze the temporal trend of melanoma skin cancer mortality in the Northeast since 2000.

## METHODOLOGY

This is a descriptive epidemiological study, whose data were obtained by consulting the INCA online mortality atlas, which was accessed from January to March 2022. The study population consisted of all diagnosed melanoma cases and registered in the period from 2000 to 2019, in both genders, in the Northeast. To avoid notification delay errors, it was decided to analyze the data available until 2019, the last year in which complete data were available. Based on INCA data, tables were used. As it is a public domain database, it was not necessary to submit the project to the Research Ethics Committee.

## RESULTS

Between 2000 and 2019, 3,467 deaths from melanoma were recorded, which were heterogeneously distributed between sex and age group (Table 2). Of these, women accounted for 1,504 deaths, while men stood

Age (years)	Number of deaths
0-4	3
5-9	7
10-14	4
15-19	13
20-29	84
30-39	213
40-49	360
50-59	580
60-69	651
70-79	707
80 or over	844
Age ignored	1

Table 2. Mortality rates from SKIN MELANOMA in the Brazilian population, per 100,000 men and women, Northeast, between 2000 and 2019, according to age group.

Sources: MS/SVS/DASIS/CGIAE/Mortality Information System – YES. MP/Brazilian Institute of Geography and Statistics Foundation - IBGE. MS/INCA/Conprev/Surveillance Division.

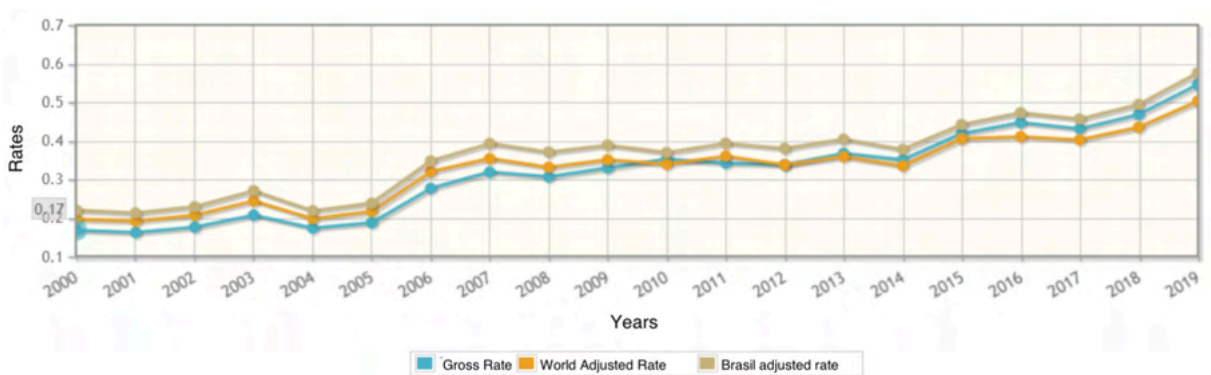


Table 3. Incidence of mortality from SKIN MELANOMA in the Brazilian population, per 100,000 men and women, Northeast, in each year from 2000 to 2019.

Sources: MS/SVS/DASIS/CGIAE/Mortality Information System - YES. MP/Brazilian Institute of Geography and Statistics Foundation - IBGE. MS/INCA/Conprev/Surveillance Division.

out with 1,963. Higher age groups represented a higher incidence of mortality.

As for the temporal trend of mortality, there is an increase in cases with poor prognosis, with few periods of reduction, but with a gross rate higher than the adjusted rate for the world and lower than the adjusted rate for Brazil.

## **DISCUSSION**

### **INCREASE IN MORTALITY IN OLDER AGE GROUPS**

An important information about sun exposure and melanoma is that cumulative and excessive exposure in the first 10 to 20 years of life greatly increases the risk of developing skin cancer, showing that childhood is a particularly vulnerable phase to the harmful effects of the Sun. (INCA, 2008).

INPE/DGE (2009) describes that ultraviolet radiation alters the DNA, genetic code, causing mutations in living beings and that each organism has systems to correct the defect, but when the organism cannot fix the defect and the cell does not die, It could be the beginning of cancer. This process is cumulative and insidious, manifesting itself over the years.

And also from this perspective, according to INCA (2008), risk factors for melanoma skin cancer involve both individual characteristics and environmental factors, including skin type and phenotype, propensity to burns and inability to tan, family history of skin cancer, level of intermittent and cumulative exposure throughout life (INCA, 2008). Another factor that directly influences the increase in the incidence of malignant skin neoplasms in elderly individuals is the population migration of retirees to coastal cities, resulting in a routine with a greater tendency to chronic photoexposure and the development of dermatoses.

For mortality, underdiagnosis in the older population also influences. Low visual acuity, numerous nevi, actinic keratosis and the development of skin lesions on the scalp can interfere with the self-perception of skin changes in the elderly and contribute to the difficulty of early diagnosis.

Other factors that determine mortality involve life expectancy, functional status, comorbidities, nutrition, polypharmacy and social support – aspects that are more expressive in adults and the elderly.

### **INCREASED MORTALITY IN MEN**

The evolution of the disease does not seem to have a different behavior according to sex. What happens for the divergent incidences, however, can be explained by the existence of a later diagnosis and by the lesser self-care with the skin.

In other studies, the assessment of social determinants and cancer mortality in terms of gender considers the differences in the political context and the scope of policies aimed at men, since the women's health network is more structured.

### **GROSS RATE LESS THAN THE ADJUSTED RATE FOR BRAZIL**

The lowest percentage of whites in the country is seen in the North and Northeast regions, with proportions below 40%. In the latter regions, pardos predominate, with a value above 50% (IBGE, 2011). Thus, as melanoma affects mainly whites, the population distribution is a possible explanation for lower mortality in the Northeast in relation to the Brazilian total.

The highest estimated rates in men and women are found in the South Region (INCA, 2009). Bonfá et al (2011) highlights that in Brazil, the population of Rio Grande do Sul, in particular, is more prone to the development of cutaneous melanoma, due to the higher

proportion of light-skinned individuals compared to other states, in addition to the high concentration of environmental UVA resulting from the geographic location and cultural habits, such as sun exposure on the beaches during the summer.

In the southeastern and southern regions, where the concentration of immigrants from Central Europe is more intense, there are communities that, for geographical, social and cultural reasons, have suffered little or almost no racial miscegenation. Consequently, these communities express an important risk, due to their racial characteristics, for the development of skin cancer (AZEVEDO AND MENDONÇA, 1992).

### **GROSS RATE HIGHER THAN THE WORLD ADJUSTED RATE**

The incidence of malignant skin melanoma has increased in several countries in the last forty years. Rural work as well as leisure habits and outdoor sports activities greatly favor sun exposure in Brazil and, above all, in the Northeast region. Despite this, miscegenation is a factor that tends to balance this risk in Northeasterners.

One of the possible causes for the higher mortality from melanoma in the Northeast, therefore, may be related to the lack of effective screening that promotes early diagnosis and effective treatment.

After all, despite all efforts in the search for new therapies for skin melanoma, lethality is still very high when detection is made late. In addition, there are reports that screening campaigns have resulted in the capture of a greater number of cases with early stage lesions in the world, such as in Australia and Scotland.

### **TEMPORAL TREND OF INCREASED MORTALITY**

The increase in the incidence and mortality

rates of this disease in recent decades is a phenomenon observed in several countries around the world and represents a high impact on the lives of populations. Among possible causes for this trend are population aging and the best diagnostic approach.

In the first case, the absolute numbers of death from this disease follow the gradual growth of the Brazilian elderly population. This increase is particularly evident in the Northeast region, where there is a significant increase for both genders. With individual risk factors in this age group, the increase in the elderly population tends to increase the incidence of the disease and, consequently, mortality.

In the second case, it is inferred that the development of medicine instructs primary care physicians to better capture patients with suspicious lesions. Thus, together with specialized care service and access to diagnostic tools, the notification process increases. An improvement in the quality of information cannot be ruled out as responsible for the increase in mortality in this Brazilian region.

In addition, in the northeast region there is a high incidence of ultraviolet rays, one of the main risk factors for the development of malignant melanoma. Data from the National Institute for Space Research (INPE) show that the Ultraviolet Index of some Brazilian capitals is at levels considered very high or extreme, and most of these capitals are located in the northeast region of Brazil.

### **CONCLUSIONS**

Finally, there is a temporal trend towards an increase in mortality from cutaneous melanoma in the northeast region, especially in the elderly and male population. Despite this, the Northeast still maintains rates lower than those of Brazil, but higher than those of the world.

The most effective measure to decrease melanoma incidence and mortality rates and to increase disease-free survival is prevention. The primary prevention involves avoiding sun exposure at times of higher UV radiation and encouraging the use of physical measures of sun protection, such as hats and umbrellas, as well as the use of sunscreens. Secondary prevention involves

early diagnosis of malignant skin lesions, with the participation of health professionals and the population itself.

In addition, it is essential that, together with early detection and diagnosis, treatment is accessible and effective. Otherwise, increased reporting will only result in higher mortality rates.

## REFERENCES

AZULAY, R. D. *Dermatologia*, 7. ed. Rio de Janeiro: **Guanabara Koogan**, 2017.

BATTISTI, Rúbia et al. Avaliação do perfil epidemiológico e da mortalidade dos pacientes com diagnóstico de melanoma cutâneo primário no município de Florianópolis-SC, Brasil. **Anais brasileiros de Dermatologia**, v. 84, p. 335-342, 2009.

BOLOGNIA, Jean L; SCHAFFER, Julie V; DUCAN, Karynne O; KO, Christine J. *Dermatologia Essencial*, 3. Ed. Rio de Janeiro: Elsevier, 2015.

BROWN, Rodrigo Vasconi Sáez et al. Mortalidade por melanoma maligno da pele em idosos do Brasil: tendência temporal no período de 2001 a 2016. 2018.

Câncer de pele melanoma - versão para Profissionais de Saúde. **INCA - Instituto Nacional de Câncer**. Disponível em: <<https://www.inca.gov.br/tipos-de-cancer/cancer-de-pele-melanoma/profissional-de-saude>>. Acesso em: 27 fev. 2022.

MÉLO, Kathleen Cézár de; SANTOS, Aísla Graciele Galdino dos; AMORIM, José Roberto; *et al.* Análise temporal da mortalidade por cancer de pele melanoma no Brasil: 2000 a 2016. **Surgical & Cosmetic Dermatology**, v. 11, n. 4, 2019.

MELO, Mayara Motta; DE CARVALHO RIBEIRO, Clarissa Santos. Novas Considerações sobre a Fotoproteção no Brasil: Revisão de Literatura/New Considerations on the Photoprotection in Brazil: Literature Review. **Revista ciências em saúde**, v. 5, n. 3, p. 80-96, 2015.

MENDONÇA, Guinar Azevedo et al. Risco crescente de melanoma de pele no Brasil. **Revista de saúde pública**, v. 26, p. 290-294, 1992.

NETO, Cyro Festa; CUCÉ, Luiz Carlos; DOS REIS, Vitor Manoel Silva. **Manual de dermatologia**, 5. ed. Editora Manole, 2019. PURIM, Kátia Sheylla Malta et al. Características do melanoma em idosos. **Revista do Colégio Brasileiro de Cirurgiões**, v. 47, 2020.

SONDA, Laíse Cristine. Fatores de risco para melanoma: uma revisão integrativa. 2011.

SANTOS, Camila Alves dos; SOUZA, Dyego Leandro Bezerra. Mortalidade por melanoma no Brasil: tendências e projeções (1998-2032). **Ciência & Saúde Coletiva**, v. 24, p. 1551-1561, 2019.

SIQUEIRA, Camila Alves dos Santos. **Projeções e tendências da mortalidade por melanoma no Brasil, de 1998 a 2032**. 2016. Dissertação de Mestrado. Brasil.

SOUZA, Sonia Regina Pereira de. **Tendência temporal da mortalidade por melanoma cutâneo no Estado de São Paulo, 1979-1998**. 2001. Tese de Doutorado. Universidade de São Paulo.

WOLFE, Klaus; JOHNSON, Richard Allen; SAAVEDRA, Arturo P; ROH, Ellen K. *Dermatologia de Fitzpatrick: Atlas e Texto*, 8.Ed. AMGH: Porto Alegre, 2019.