Oncology 2025
The Cancer Control Challenge:
Better Understanding It to Better Face It

ANALYSIS OF THE SPATIAL DISTRIBUTION AND EPIDEMIOLOGICAL PROFILE OF MALIGNANT BRAIN NEOPLASMS IN THE NORTHERN REGION OF BRAZIL

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Introduction: Hospitalizations due to malignant brain neoplasms have increased in the last decade in Brazil, however, there is little regional approach contextualizing the spatial distribution and profile of patients, especially in neglected regions, such as the Northern region. **Objectives:** To analyze the spatial distribution, significant differences between states and the epidemiological profile of patients hospitalized for malignant brain neoplasia in the Northern region of Brazil. **Methods:** This is an ecological study, descriptive and inferential, retrospective, cross-sectional and quantitative nature, carried out using secondary data from the "Departamento de Informação e Informática do Sistema Único de Saúde" (DATASUS) in the Hospital Morbidity category of the SUS (SIH/SUS), with the selection of cases of malignant neoplasm of the brain from 2015 to 2024. In this context, the variables selected for analysis of hospitalizations were: federation units, municipalities, year, ethnicity, sex, age group, type of care and deaths. These data were stored in Excel software and calculated in R.4.5. Additionally, the cartographic bases of the "Instituto Brasileiro de Geografia e Estatística" (IBGE) were used in the SIRGAS 2000 projection for the construction of Kernel density map in the QGIS software. **Results:** In the respective period, 6.298 hospitalizations were carried out, occurring mostly in Pará (39.22%), followed by Rondônia (22.98%). In these locations with clusters of cases, the municipalities of Belém and Porto Velho presented high density on the Kernel density map, being hotspots (n=>1.000) for hospitalization due to tumor. In contrast, the smallest amount happened in Roraima (1.76%). These hospitalizations by states during the study period presented a normal distribution, with non-homogeneous variances and statistically significant differences in the means, especially in Pará in relation to the other states after post-hoc analysis, with a highly significant difference (p<0.001) and magnitude (Cohen's d) highlighted in relation to Amapá, Amazonas, Roraima and Tocantins. Regarding the temporal analysis, the year 2024 prevailed as the peak (13.54%) and the year 2015 presented as the minimum (7.86%). Furthermore, in the ethnicity analysis, it occurred in the order: brown (69.16%),

without information (19.47%), white people (6.41%) and others. From the perspective of the gender variable, men represented the most affected (55.41%) compared to women (44.59%). The age group of 40 to 59 years (30.17%) and 60 to 80 years (22.82%) presented the highest percentage in adults, while in children it happened in the age group of 5 to 9 years (10.27%). In terms of care, the expressive need for urgent hospitalization was noted (74.01%). Finally, there were 1.035 deaths, with a significant portion occurring in Pará (41.16%). **Conclusion:** There has been a significant increase in hospitalizations for malignant brain tumors over the years, especially in states and municipalities with regional oncology referral centers, such as Pará, highlighted as a hotspot. These tumors predominantly affect brown individuals, men, and the elderly, but are also prevalent in children aged 5 to 9 years. The urgent nature of hospitalizations in summarized by the high mortality rate (16.43%). Therefore, regional analyses are important for understanding brain tumors in Brazil.

Keywords: Brain Neoplasms; Epidemiology; Health Management.