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Temporal trends and equity determinants of hospitalizations and outpatient access for headache disorders in Sergipe, Brazil (2015–2024): a population-based ecological study

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Introduction
Limitations in health-care access across Brazilian regions, with specialized services concentrated in major urban centers and insufficient outpatient care, lead patients to seek emergency services. Headache disorders illustrate this gap: although disabling and generally manageable in the outpatient setting, they become a cause of hospitalization when such access fails. Tracking the evolution of hospitalizations and outpatient care and their distribution across the territory allows the equity of access to be assessed — still understudied in Sergipe.

Objective
To investigate municipal determinants of equity in health-care access and temporal trends in hospitalizations and specialized outpatient care for headache disorders in Sergipe between 2015 and 2024.

Methods
Ecological time-series study using secondary data from DATASUS and denominators from the 2022 Census. Headache hospitalizations (ICD-10 G43–G44) were the outcome. The analyzed variables were the hospitalization rate per 100,000 inhabitants by sex and age group, the Gini index, and neurologist density. Trends were assessed by Prais-Winsten regression and the Mann-Kendall test (significance level 5%; $p<0.05$); equity associations by Spearman correlation; and geographic concentration by the Gini index of distribution.

Results
Between 2015 and 2024, the mean annual headache hospitalization rate in Sergipe (1.7) was about 64% lower than the national average (4.8); however, the state rate grew more steeply (+238% vs. +40% nationally), approaching the national level. Outpatient production fell sharply in 2020 (−26.4% versus 2019), followed by significant recovery (+168.5% by 2024; rho=1.00; $p<0.001$ post-2020). Hospitalizations predominated among women (67.1%; F:M ratio 2.04:1) and the 20–59 age group (63.5%; peak at 30–39 years). Specialized supply was scarce and concentrated: only 15% of municipalities (11/75) had a neurologist, and five (Aracaju, Nossa Senhora do Socorro, Capela, São Cristóvão, and Lagarto) accounted for 61.1% of hospitalizations (Gini=0.78). The rate correlated inversely with the income Gini index (rho=−0.38; $p<0.01$), and the number of neurologists was associated with hospitalization volume (rho=0.42; $p<0.01$), but not with the population-adjusted rate ($p=0.12$), indicating diagnosis-dependent registration.

Conclusion
Sergipe showed a hospitalization rate lower than the national rate, though in rapid convergence. The 2020 outpatient drop and subsequent recovery reveal the impact of the COVID-19 pandemic on specialized access, with interruption of elective care followed by pent-up demand. The scarcity and concentration of neurologists indicate marked territorial inequity, reinforced by lower hospitalization in poorer municipalities and by greater hospitalization where specialized therapeutic care is available. These findings support strengthening diagnosis in primary care and decentralizing neurology to mitigate avoidable hospitalizations.

Keywords:
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