



## Burden of Hospitalizations for Primary Headaches in Brazil: A Cost-Effectiveness Argument for Strengthening Primary Care

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**Background:** Primary headaches, particularly migraine and tension-type headache, are highly prevalent in Brazil and frequently underdiagnosed and undertreated. Inadequate preventive care may lead to avoidable hospitalizations, increasing the economic burden on the public health system. Herein, it was aimed to estimate hospitalization burden from primary headaches in Brazil and simulate the cost-effectiveness of expanding prophylaxis in primary care.

**Method:** Hospital admission data from DATASUS (Brazil's Unified Health System database) for ICD-10 codes G43 (migraine) and G44 (other headache syndromes) from 2010 to early 2025 were analyzed to assess hospitalization burden. Total admissions, age distribution, and costs were extracted. A cost-effectiveness model compared hospitalization costs with projected expenses of preventive treatments (amitriptyline, propranolol, topiramate) using average Brazilian public health system (SUS) drug prices.

**Results:** A total of 133,399 hospitalizations were recorded, with estimated costs surpassing R\$173 million. In 2019, the highest number of cases (12,120) was reported, disproportionately affecting those aged 15–19. Based on national prevalence (~15%) and assuming that 3–5% of adults experience chronic or high-frequency migraine, approximately 1 million Brazilians would be eligible for prophylaxis. Using 2025 prices from SUS's database, annual treatment costs for 1 million patients are estimated in million of reais:

R\$18 for propranolol (40 mg/day), R\$62 for amitriptyline (25 mg/day), or R\$150 for topiramate (50 mg/day). Preventive treatment is estimated to cost R\$30-40 million per year. Modeling suggests that preventing just 25% of hospitalizations could save approximately R\$43 million, which would already offset a substantial portion of that investment. Even with higher-cost options like topiramate, the trade-off remains favorable. Figure 1 illustrates the cost gap.

**Conclusion:** Primary headache hospitalizations in Brazil burden the public system and disproportionately affect young adults, a population in which migraine reduces quality of life and productive years. Expanding preventive care in primary settings is cost-effective, lowers long-term costs, alleviates pressure on emergency and inpatient services, and may improve outcomes. Preventive care shifts the focus from crisis management to long-term control - crucial in resource-limited systems. Expanding access to low-cost options such as amitriptyline, propranolol, and topiramate is already cost-effective; adding further treatments such as nortriptyline, onabotulinumtoxinA, or monoclonal antibodies may further improve economic impact. These findings support integrating migraine prophylaxis into primary care to reduce hospital burden, optimize spending, and improve outcomes.

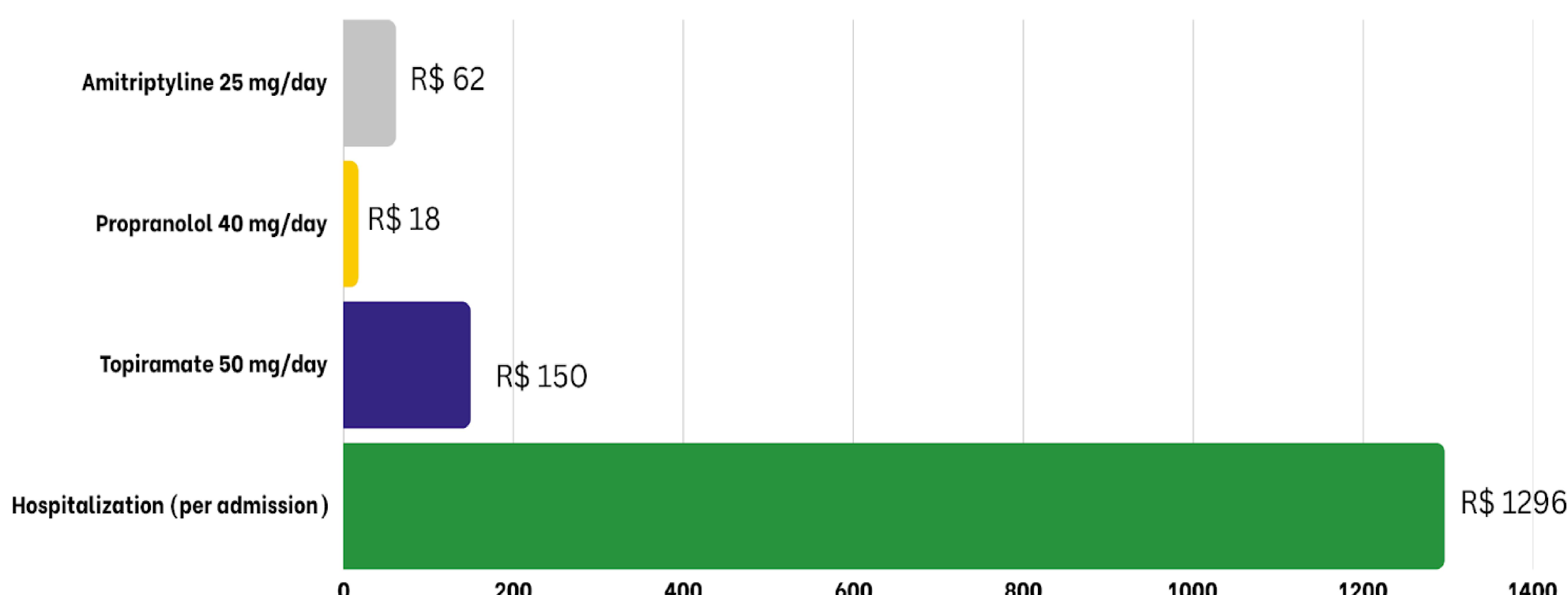


Figure 1: Illustration of the annual cost per patient. Values are informed in brazilian real (BRL).

