



Correspondence about the article: Asthma in the Brazilian Unified Health Care System: an epidemiological analysis from 2008 to 2021

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We received with great interest the article published in the *Jornal Brasileiro de Pneumologia*, authored by Pinheiro et al.⁽¹⁾ and titled "Asthma in the Brazilian Unified Health Care System: an epidemiological analysis from 2008 to 2021". Their article contains important data on mortality and hospitalizations associated with asthma in Brazil between 2008 and 2021 in the Brazilian *Sistema Único de Saúde* (SUS, Unified Health Care System). The data were extracted from the Information Technology Department of the SUS (DATASUS) in 2022. The authors concluded that the number of deaths and hospitalizations for asthma decreased over the course of the period studied.

Our group analyzed asthma mortality data (ICD-10 codes J45 and J46) in Brazil from the National *Sistema de Informação sobre Mortalidade* (SIM, Mortality Database),⁽²⁾ and observed that the number of asthma-related deaths is 3 to 6 times higher than that obtained by the DATASUS.⁽³⁾ Pinheiro et al.⁽¹⁾ found that there were more than 8,000 asthma-related deaths in the 2008-2021 period. In the same period, according to SIM data, there were 34,163 deaths attributed to asthma: 2,696 in 2008 and 2,802 in 2022. Therefore, in 2022, there were an alarming seven asthma-related deaths per day in Brazil,⁽³⁾ which is in contrast with the one death per day reported by Pinheiro et al.⁽¹⁾

Given this context, it is important to emphasize that the mortality data generated by DATASUS come from the outcome "in-hospital death" from the "paid during the period" authorized hospital admissions (AHAs). This

information reflects asthma-related deaths occurring only during hospitalization for the disease. On the other hand, the SIM provides information derived from death certificates and thus reports deaths occurring in the public and private health care systems, as well as those occurring outside the hospital setting. Consequently, if the AHA had been generated for a condition other than asthma, an in-hospital death attributed to asthma on the death certificate would not have been counted as an asthma-related death by the DATASUS, which constitutes an additional factor that differentiates DATASUS data from SIM data.

We stress that asthma-related mortality in Brazil has increased over the last 10 years, and that the mortality rate cited by Pinheiro et al.⁽¹⁾ reflects data from hospitalizations only within the SUS. We also emphasize that 19% and 67% of the asthma-related deaths in Brazil occurred in adults (≥ 40 and < 60 years of age) and the elderly (≥ 60 years of age), respectively. In conclusion, despite the availability of free asthma medication throughout the country, asthma mortality has been increasing, especially among adults and the elderly. Therefore, it is essential to improve access to the diagnosis and treatment of this disease, which is the second most prevalent respiratory disease in Brazil.

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Authors' reply

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We received with great interest the correspondence JBPNEU-2024-0196, containing the comments from Rabahi et al. about our study entitled "Asthma in the Brazilian Unified Health Care System: an epidemiological analysis from 2008 to 2021."⁽¹⁾ They suggested that our results demonstrating a reduction in in-hospital asthma-related mortality run contrary to their results showing an increase in such mortality in the last ten years.⁽²⁾ We consider that the results of the two studies are not contradictory but rather complementary and can further understanding of what has happened to individuals with asthma during the last decade.

It is widely known that asthma medication is freely available via the Brazilian *Sistema Único de Saúde* (SUS, Unified Health Care System), improving asthma treatment. In our opinion, the apparent difference between the results of the two studies is a consequence of inadequate treatment despite the available medication. When patients receive proper treatment for exacerbations during hospitalization (for instance), the number of deaths can be reduced.

We also emphasize that the two studies differed in terms of the databases consulted, which could explain the distinct results and misinterpretations. We used data from the Information Technology Department of the SUS (DATASUS), which includes only individuals treated via the public health care system, as was well stated by Rabahi et al. in their correspondence ("this information reflects asthma-related deaths occurring only during hospitalization for the disease" which was stated in our article). In contrast, Rabahi et al. used data from the Brazilian National Mortality Database, which includes individuals treated via the public and

private health care systems. In addition, the increase in the number of asthma-related deaths observed by Rabahi et al.⁽²⁾ represented a "special increase among adults in the last three years (2020 to 2022)"; that is, during the COVID-19 pandemic. This period presented a marked increase in the number of deaths caused by respiratory symptoms in adults and the elderly, which may have resulted in the cause of death being misrepresented. Furthermore, our data show a linear decline in the number of hospitalizations and deaths in the previous ten years, which continued during the COVID-19 pandemic. Moreover, the Brazilian Thoracic Society website recently published data referring to asthma in Brazil (also collected from DATASUS), indicating that in 2022 there were 83,155 hospitalizations for asthma and 524 deaths from the disease, stating that the "expansion of care and access to medications . . . led to a significant drop in hospitalizations for asthma", corroborating our results.⁽³⁾ Finally, our study shows other relevant and associated findings, including hospitalization rates and costs in the various regions of Brazil.

In conclusion, we agree that not all patients with asthma receive proper medical treatment in Brazil, despite the availability of free asthma medication treatment throughout the country, and that we still have a lot of work to do. We are also anxious to carefully analyze the results presented by Rabahi et al.,⁽²⁾ which will undoubtedly add important information on asthma-related deaths in Brazil. It will be important to understand whether the increase in the number of deaths was due to asthma itself or was a consequence of the pandemic.

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