



Correspondence about the article: Trends on the Brazilian asthma mortality rate: a call for a standardized protocol analysis from the DATASUS databases

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DEAR EDITOR:

We appreciate the recent article by Pinheiro et al. (2024), entitled "Asthma in the Brazilian Unified Health Care System: an epidemiological analysis from 2008 to 2021", published in the *Jornal Brasileiro de Pneumologia*, which provides valuable insights into the epidemiology of asthma in Brazil.⁽¹⁾ However, we have some concerns regarding the interpretation of the asthma mortality data, which warrants further attention.

Pinheiro et al.⁽¹⁾ reported lower mortality rates than those previously documented in Brazil, which totaled 2,047 in 2013.⁽²⁾ Between 2008 and 2021, Pinheiro et al.⁽¹⁾ reported 8,497 deaths from asthma, whereas other official mortality data sources indicate that this number was approximately 34,000. Upon reproducing this data, we found that the values presented by the authors were derived from TabNet, which focuses exclusively on deaths related to hospitalizations. Relying on data from this platform may lead to a significant underestimation of asthma-related deaths, as it does not account for deaths occurring outside the hospital setting, including those in non-hospital healthcare facilities.

The presentation of this data using the term "mortality rate" implies that all deaths from the disease in Brazil are included, as already described in both national and international literature. For this reason, we consider the use of underlying cause of death data, available in the Mortality Information System (SIM), to be the most appropriate choice to avoid underreporting. Furthermore, the lack of population adjustment based on the most recent IBGE census (2022) may have led to an overestimation of the population, thereby impacting the mortality rate calculation, as the 2010 projections referenced in the study have an estimated error of approximately 10 million inhabitants.

Our results, submitted for publication in this journal in April 2024 (ID: JBPNEU-2024-0138), indicate that after a long-term historical decline, there was an

increasing trend in asthma mortality after 2014. We highlight that the data analyzed in our report (detailed information available at: https://github.com/mobrant94/asthma_mortality) took the following key factors into account: 1) Brazilian population growth from 2014 to 2021; 2) Exclusion of cases related to the COVID-19 pandemic in 2020 and 2021; and 3) Exclusion of the number of registered deaths in individuals aged ≤ 6 years. Our findings in terms of numbers and mortality rates align with the trends reported by the World Health Organization (WHO) Mortality Database platform for the period between 2014 and 2020.⁽³⁾ We recommend that future research on asthma mortality in Brazil utilize the same data sources for general asthma mortality, specifically the DATASUS Mortality Information System (SIM), which encompasses all causes of death and allows for a reliable analysis of mortality.

In summary, it is important that future epidemiological studies on asthma mortality employ standardized methods and reliable data sources to avoid misinterpretations. We appreciate the opportunity to discuss these issues and hope to contribute to a better understanding of asthma mortality trends in Brazil.

AUTHOR CONTRIBUTIONS

M.O.A. participated in the conception and design of the study, elaborating the letter and reviewing it critically. F.F. and P.M.P. participated in the design of the study, interpretation of data, writing the article, and reviewing it critically. All authors approved the final version to be published.

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Author's Reply 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 correspondence "Trends on the Brazilian asthma mortality rate: a call for a standardized protocol analysis from DATASUS databases" (ID: JBPNEU-2024-0162), which includes comments from Antunes et al. regarding our study, "Asthma in the Brazilian Unified Health Care System: an epidemiological analysis from 2008 to 2021".⁽¹⁾ They suggest that our results may lead to an underestimation of the number of deaths reported in our study. However, we disagree, as our study aimed to "analyze the number of hospitalizations, the length of hospital stay, and mortality due to asthma". Therefore, it could not underestimate the total number of deaths in Brazil. In addition, we utilized the Information Technology Department of the Brazilian Unified Health Care System (DATASUS), a secure public platform provided by the Ministry of Health, which specifically reports the mortality of hospitalized patients, as clearly stated in our study. The results presented by Antunes et al. are not contradictory but rather complementary. For instance, while their findings highlight an increase in the number of deaths, this observation alone raises concern without explaining the underlying causes. On the other hand, our findings on the reduced mortality in hospitalized patients strongly suggests that the increased mortality may be due to inadequate pharmacological treatment for those not hospitalized.

We acknowledge that there is a discrepancy in the number of deaths reported in 2013 in our study compared to the findings of Cardoso et al.⁽²⁾ However, we emphasize that this comparison is inappropriate, as they are analyzing entirely different populations. Furthermore, our study indicated in the limitations section that the data analyzed were collected from

electronic records, which may vary from other sources. Regarding the pandemic period, we also noted that the reduction in the number of hospitalizations from 2020 to 2021 could be associated with the restriction measures recommended by the World Health Organization (WHO) due to COVID-19.

In addition, the *Sociedade Brasileira de Pneumologia e Tisiologia* recently published data regarding asthma in Brazil (also collected from DATASUS), indicating that in 2022, there were 83,155 hospitalizations due to asthma and 524 deaths. The report states that the "extension of care and access to medications... led to a significant drop in asthma medication".⁽³⁾ Consistent with our findings, the authors also assert that the "expansion of care and access to medications led to a significant drop in hospitalizations for asthma".⁽¹⁾ We agree with the authors that it is crucial for future epidemiological studies on asthma mortality to employ standardized methods and reliable data sources. Finally, contrary to the statement made by Antunes et al., the number of patients was standardized according to population growth based on data from the *Instituto Brasileiro de Geografia e Estatística* (IBGE, Brazilian Institute of Geography and Statistics) website. Therefore, we look forward to carefully analyzing the results that will be published by Antunes et al., as they will contribute to a better understanding of asthma mortality in Brazil.

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