Balkan Med J 2025;42:181-2

In Response to "The Importance of Age Standardisation in Comparing Regional Inequalities"

Anıl Şahin[1], Tuğçe Çöllüoğlu[2], Ahmet Çelik[3], Naim Ata[4], Mehmet Birhan Yılmaz[5], Dilek Ural[6], Arzu Kanık[7], Mustafa Okan Ayvalı[4], Mustafa Mahir Ülgü[4], Şuayip Birinci[8]

[1]Department of Cardiology, Sivas Cumhuriyet University Faculty of Medicine, Sivas, Türkiye
[2]Department of Cardiology, Karabük University Faculty of Medicine, Karabük, Türkiye
[3]Department of Cardiology, Mersin University Faculty of Medicine, Mersin, Türkiye
[4]General Directorate of Health Information Systems, Ministry of Health, Ankara, Türkiye
[5]Department of Cardiology, Dokuz Eylül University Faculty of Medicine, İzmir, Türkiye
[6]Department of Cardiology, Koç University School of Medicine, Mersin, Türkiye
[7]Department of Biostatistics and Medical Informatics, Mersin University Faculty of Medicine, Mersin, Türkiye
[8]Republic of Türkiye Ministry of Health, Ankara, Türkiye

We thank the author of the letter for their interest in our article, "Exploring Regional Disparities in Heart Failure Epidemiology and Outcomes: A Comprehensive Study Across Geographical Regions in Türkiye".[1] The feedback provides an opportunity to address methodological considerations and future directions in heart failure (HF) research.

The letter raises the point that age standardization is a useful tool for comparing regional HF prevalence and outcomes. While we recognize the importance of age as a factor influencing HF prevalence-especially in regions with older populations-we focused on reporting the observed data to highlight the real-world burden of HF across Türkiye's diverse regions. Our results already account for the variations in mean age among regions, which was clearly discussed in the context of the higher HF burden in the Black Sea Region due to its older population. Nonetheless, we agree that age-standardized metrics can offer additional insights and may be explored in future analyses to complement the observed data.

While our study primarily focused on geographic disparities, it also touched on broader determinants such as socioeconomic differences and healthcare access, which are intrinsically linked to health outcomes. As highlighted in other studies, regional inequalities in healthcare quality, infrastructure, and social determinants play a critical role in shaping HF prevalence and outcomes.[2,3] Future research could further explore these dimensions using more granular socioeconomic data.

Our analysis provides valuable insights into the real-world epidemiology of HF in Türkiye, which reflects both the demographic realities and the healthcare challenges of the country. By presenting the observed data, policymakers and healthcare planners can better understand the actual burden in each region and design interventions that address not only age-related factors but also disparities in healthcare access and quality. Age standardization, while a useful methodological adjustment, is one of several tools to consider when interpreting epidemiological data.[4]

We appreciate the thoughtful critique and will consider incorporating age-standardized analyses in future studies to enhance the robustness of regional comparisons. This approach, alongside additional investigations into the interplay between socioeconomic factors and HF burden, will further enrich our understanding of the disparities in HF epidemiology.

Authorship Contributions: Concept- A.Ş., T.Ç., A.Ç., N.A., M.B.Y., D.U., A.K., M.O.A., M.M.Ü., Ş.B.; Design- A.Ş., T.Ç., A.Ç., N.A., M.B.Y., D.U., A.K., M.O.A., M.M.Ü., Ş.B.; Data Collection or Processing- A.Ş., T.Ç., A.Ç., N.A., M.B.Y., D.U., A.K., M.O.A., M.M.Ü., Ş.B.; Analysis or Interpretation- A.Ş., T.Ç., A.Ç., N.A., M.B.Y., D.U., A.K., M.O.A., M.M.Ü., Ş.B.; Literature Search- A.Ş., T.Ç., A.Ç., N.A., M.B.Y., D.U., A.K., M.O.A., M.M.Ü., Ş.B.; Writing- A.Ş., T.Ç., A.Ç., N.A., M.B.Y., D.U., A.K., M.O.A., M.M.Ü., Ş.B.

Conflict of Interest: No conflict of interest was declared by the authors.

Corresponding author: Anıl Şahin, Department of Cardiology, Sivas Cumhuriyet University Faculty of Medicine, Sivas, Türkiye

e-mail: dr.anil.sahin@gmail.com

Received: November 06, 2024 **Accepted:** November 21, 2024 **Available Online Date:** March 03, 2025 • **DOI:** 10.4274/balkanmedj.galenos.2024.2024-10-40.response

Available at www.balkanmedicaljournal.org

ORCID iDs of the authors: A.Ş. 0000-0003-3416-5965; T.Ç. 0000-0002-2227-6177; A.Ç. 0000-0002-9417-7610; N.A. 0000-0001-6947-2821; M.B.Y. 0000-0002-8169-8628; D.U. 0000-0003-0224-1433; A.K. 0000-0002-7068-1599; M.O.A. 0000-0002-0116-5152; M.M.Ü. 0000-0003-0825-1851; Ş.B. 0000-0001-8104-6198.

Cite this article as: Şahin A, Çöllüoğlu T, Çelik A, Ata N, Yılmaz MB, Ural D, Kanık A, Ayvalı MO, Ülgü MM, Birinci Ş. In Response to "The Importance of Age Standardisation in Comparing Regional. Balkan Med J.; 2025; 42(2):181-2.

REFERENCES

1. Şahin A, Çöllüoğlu T, Çelik A, et al. Exploring regional disparities in heart failure epidemiology and outcomes: a comprehensive study across geographical regions in Türkiye. *Balkan Med J*. 2024;41:47-53. [CrossRef]
2. Yogeswaran V, Hidano D, Diaz AE, et al. Regional variations in heart failure: a global perspective. *Heart*. 2023;110:11-18. [CrossRef]
3. Vergallo R, Patrono C. Heart failure and socioeconomic status: global differences and inequalities. *Eur Heart J*. 2023;44:3038-3039. [CrossRef]
4. Brown JP, Hunnicutt JN, Ali MS, et al. Quantifying possible bias in clinical and epidemiological studies with quantitative bias analysis: common approaches and limitations. *BMJ*. 2024;385:e076365. [CrossRef]