



## Comment on “Exploring Regional Disparities in Heart Failure Epidemiology and Outcomes: A Comprehensive Study Across Geographical Regions in Türkiye”

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I read the original article by Şahin et al.<sup>1</sup> with considerable interest, which revealed geographic disparities in heart failure (HF) characteristics, including decreased mortality rates in socioeconomically impoverished areas of Türkiye. I would like to commend the authors for their comprehensive analysis as well as share our insights to enhance the understanding of the article.

Despite the apparent decrease in HF incidence in industrialized nations, its prevalence is rising. This rise in incidence is attributable to the aging population, advances in the treatment and survival of individuals with ischemic heart disease, and the availability of effective medications that extend the lifespan of HF patients.

Research has revealed that lower socioeconomic status (SES), including factors such as education, income, occupation, and region-based measures, is consistently and independently associated with a heightened risk of developing HF in high-income countries.<sup>2</sup> The increased prevalence of adverse behavioral risk factors, such as smoking, physical inactivity, poor diet, and medication non-adherence, has been hypothesized as the basis of the link between low SES and an elevated incidence of cardiovascular disease.<sup>3</sup> In contrast to these data, the Eastern Anatolia region, which is a low-SES region, demonstrated the lowest all-cause mortality rates in the current study. In low-SES regions, as opposed to industrialized areas, it is crucial to adopt a natural lifestyle and emphasize the role of lowering anxiety disorder levels among patients. Larger-scale investigations are necessary to assess the influence of these factors on HF-related mortality.

It was determined that the Eastern Anatolia region possessed the lowest rate of use of guideline-based medical treatment for HF. A study that corroborates the extant findings has demonstrated that patients residing in socioeconomically disadvantaged areas may be at an increased risk of medication non-adherence due to limited access to transportation and pharmacies.<sup>4</sup> The limited adoption of

guideline-based medical treatment in regions such as the Eastern Anatolia region can be attributed to the poor SES of those living in these areas. As indicated in the article, diabetes patients in Türkiye are not eligible for reimbursement for SGLT2 inhibitor (SGLT2i). The prevalence of high SGLT2i usage, which stands at 11.8%, in the Mediterranean and Aegean areas can be attributed to the high SES of the residents in this area.

Although the study did not specifically assess ejection fractions, it can be hypothesized that there were more patients with preserved ejection fraction overall, given that the prevalence of heart failure with preserved ejection fraction (HFpEF) is typically higher in women than in men.<sup>5</sup> A study that investigated the clinical characteristics of HFpEF patients in Türkiye based on their geographical diversity revealed that approximately 57% of the patients were female.<sup>6</sup>

The prevalence of rheumatic heart disease is the primary reason for the higher HF rates caused by valve disease in low-income populations.<sup>7</sup> The availability of patients' echocardiographic examinations would enable an assessment of the distribution of rheumatic valve disease in terms of the socioeconomic levels of the regions. This hypothesis is further substantiated by the fact that valvular diseases are one of the primary etiologies of HFpEF in Eastern Anatolia.<sup>6</sup>

Furthermore, HF is a significant public health concern that imposes a substantial economic burden because of increased life expectancy and the introduction of novel treatment modalities.<sup>8</sup> A study examining the medical expenditure of HF in Türkiye showed that the annual direct medical costs per patient were \$887.<sup>9</sup> This study confirms that HF imposes a substantial economic burden on Türkiye, encompassing both direct and indirect costs. Investigating regional differences in HF outcomes and determining effective management strategies customized to the disease's regional distribution will facilitate effective healthcare resource management. By identifying regional deficits in HF treatment and appropriately implementing



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guideline-based therapies, disease progression may be delayed, thereby reducing the medical expenditures associated with disease management.

Thus, the current study demonstrates the continued underutilization of chronic therapies that improve survival as well as the necessity for more widespread implementation of guideline-based therapies and implantable cardioverter defibrillators.

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