THE AGING FACE OF RHEUMATIC HEART DISEASE IN UNITED STATES: MORTALITY TRENDS OVER TWO DECADES (1999– 2020)

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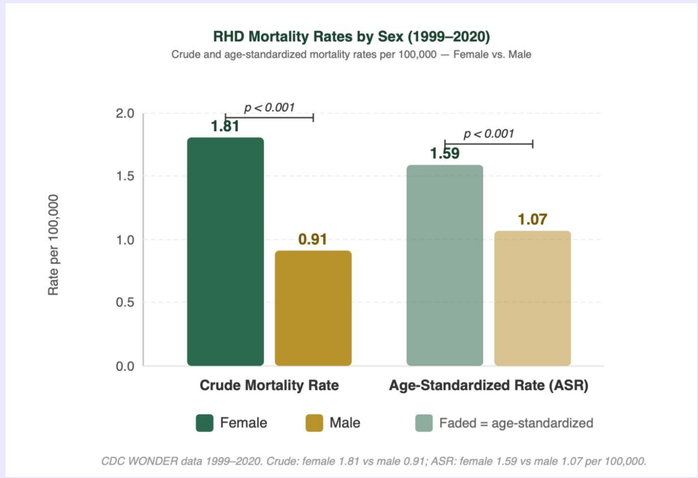
Introduction

Rheumatic heart disease (RHD) remains a major cause of preventable cardiovascular mortality, but its epidemiology differs by setting. In low-income regions, repeated childhood streptococcal exposure leads to early, often fatal diseases. In the United States, improved recognition shifts the burden toward older adults. RHD is associated with rhythm complications, particularly atrial fibrillation (AF). The REMEDY study reported AF in 21.8% of patients, while monitoring-based cohorts show arrhythmias in more than 70%. Despite this pattern, recent U.S. mortality trends, including differences by sex and region, have not been fully evaluated.

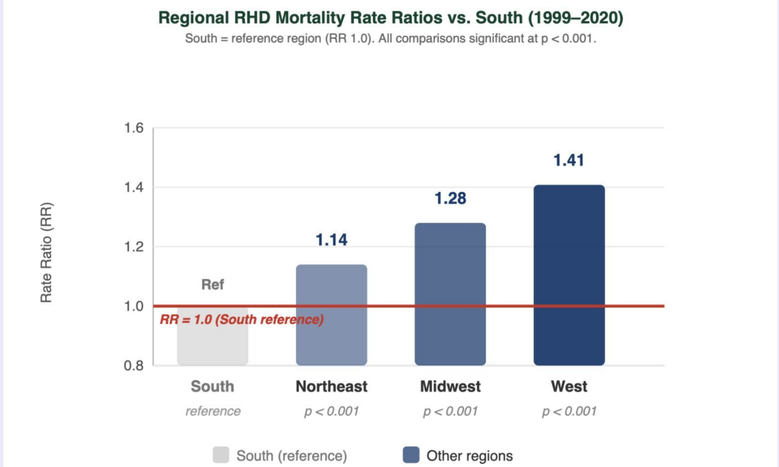
Methods

We analyzed CDC WONDER mortality data for U.S. adults ≥15 years (1999–2020). Crude and age-standardized mortality rates (ASRs) were calculated, and rate ratios (RRs) estimated with log-Wald methods. Adjusted incidence-rate ratios (IRRs) and sex–region interaction were assessed using multivariable Poisson regression with population offsets.

Findings



CDC WONDER data 1999–2020. Crude: female 1.81 vs male 0.91; ASR: female 1.59 vs male 1.07 per 100,000.



Rate ratios vs. South using log-Wald methods. South had lowest ASR. RR range: 1.14–1.41.

Results

A total of 74,292 RHD deaths occurred (50,287 females; 24,005 males). Crude mortality was higher in females (1.81 vs 0.91 per 100,000), and age-standardized mortality remained elevated (ASR 1.59 vs 1.07; p<0.001). Mortality before age 35 was rare, increasing sharply after 55 years. Regional differences were notable: the South had the lowest ASR, followed by the Northeast, Midwest, and West. Compared with the South, mortality was higher in all other regions (RRs 1.14–1.41; p<0.001). Adjusted models confirmed lower male mortality and a modest sex–region interaction.

Conclusion

U.S. RHD mortality reflects advanced valvular disease with increased susceptibility to AF and other rhythm disturbances, with most deaths occurring after age 55. A consistent female predominance across regions may relate to emerging evidence that estrogen mediated prothymosin-α signaling enhances immune activation, atrial inflammation, and remodeling. These findings provide the first nationwide rhythm-focused characterization of RHD mortality and highlight the need for improved rhythm surveillance and timely intervention as the RHD population ages.