

Conference abstract

Heart failure and atrial arrhythmias mortality in the United States (1999-2024): A 26 year analysis of temporal trends and sociodemographic disparities.

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INTRODUCTION

Heart failure (HF) and atrial arrhythmias such as Atrial fibrillation and Atrial flutter frequently coexist and are associated with significant morbidity, mortality, and healthcare burden in the United States. The bidirectional pathophysiological relationship between these conditions results in worse clinical outcomes compared to either disease alone. Over the years, there have been improvements in management of these conditions that have affected the mortality patterns. However, the mortality burden remains high and evaluation of these trends across different subgroups is limited. Understanding these trends is important to inform targeted prevention strategies and health policy planning.

METHODS

We conducted a retrospective analysis to obtain death data using the Centers for Disease Control and Prevention WONDER (Wide-ranging Online Data for Epidemiology Research) database from 1999 to 2024 using ICD-10 codes for Heart Failure (I50) and Atrial fibrillation and flutter (I48). Age-adjusted mortality rates (AAMRs) were calculated per 100,000 persons and stratified by year, sex, race, ethnicity, and geographical census region. Data was analyzed using Microsoft Excel and Joinpoint regression and Trends were assessed by Average Annual Percentage Change (AAPC) for AAMR with 95% CI and p-value. A significance level of $p < 0.05$ was used.

RESULTS

This analysis depicts a rising trend in mortality rates of heart failure combined with arrhythmias such as Atrial fibrillation with significant demographic and geographic dis-

parities. Females, and Western population are particularly affected more, thus targeted interventions and equitable healthcare access are crucial to mitigate these disparities and improve outcomes for these populations.

CONCLUSIONS

Between 1999 and 2024, HF and Atrial arrhythmias combined contributed to 1,200,447 deaths across the US. Overall, there was a significant increase in AAMR from 7.7 in 1999 to 20.07 in 2024, with an AAPC of 3.73 (3.13 to 4.33), $p < 0.001$. While both Genders had similar rising trends AAPC (3.94 for women and 5.23 for men), women had a higher overall mean AAMR of 14.40 (SD=5.65) compared to men's 11.31 (SD=3.43), $p < 0.02$. Race-based differences in mortality rates were statistically significant (one-way ANOVA: $F(2,75)=21.14$, $p < 0.001$). Mean rates were highest among White individuals (13.41 4.82), followed by Black or African American (8.23 3.36) and American Indian or Alaska Native populations (7.33 2.28). Mortality rates were significantly higher among non-Hispanic or Latino individuals (13.08 4.67) compared with Hispanic or Latino populations (6.33 2.31). This difference was statistically significant on two-sample t-testing ($t=6.60$, $df=37$, $p < 0.001$), indicating notable ethnic disparities in mortality burden. Regional variation in mortality rates was observed across U.S. Census regions, with the highest mean AAMR in the West (14.12 4.61), with states affected most were Oregon (20.7), Washington (18.4) and Idaho (15.6), and lowest AAMR in Northeast (11.35 3.43). The observed geographic differences highlight potential regional disparities in cardiovascular risk profiles, healthcare access, and population demographics.



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