Persistent Disparities in Multiple Myeloma and Renal Disease Mortality Across U.S. Demographics and Regions (1999-2020): A CDC WONDER Database Analysis

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Context

Multiple myeloma and renal diseases remain critical public health challenges in the U.S., with mortality patterns reflecting underlying disparities in healthcare access, socioeconomic status, and environmental risk factors. Despite medical advancements, specific populations continue to experience disproportionately higher mortality rates.

Objectives

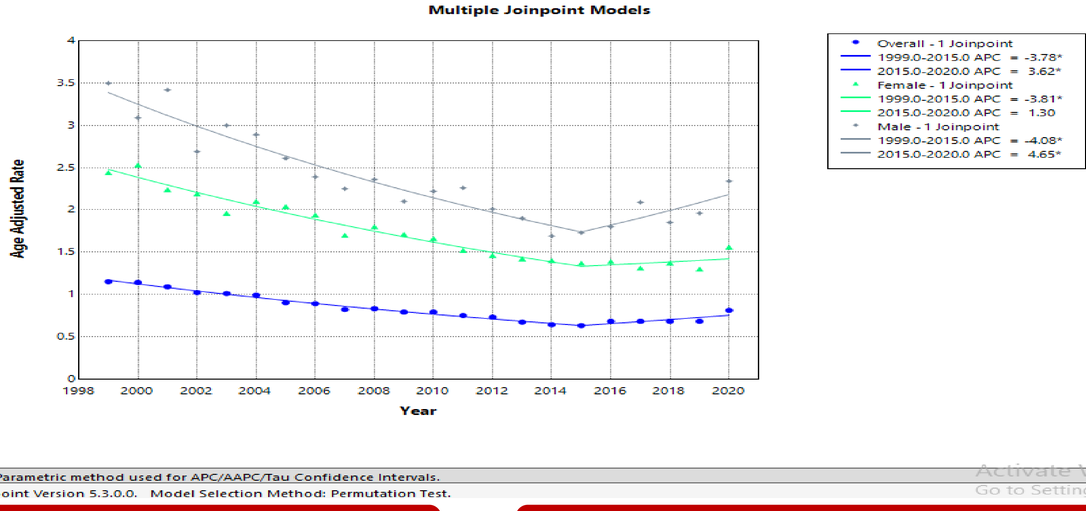
To assess the mortality trends, demographic variations, and geographic disparities in multiple myeloma and renal disease-related deaths.

Methods

Data on mortality were extracted from the Centers for Disease Control and Prevention's Wide-Ranging Online Data for Epidemiologic Research (CDC WONDER). The analysis of Multiple Cause of Death Files was conducted from 1990 to 2020 to identify fatalities of Multiple Myeloma and Renal disease. Crude rates and age-adjusted mortality rates (AAMRs) per 100,000 populations were calculated for variables including age, gender, race, and geographic regions. Joinpoint regression analysis was utilized to evaluate annual percentage changes (APC).

Results

Between 1999 and 2020, there were 52,054 deaths from multiple myeloma and renal disease. However, the AAMR declined from 2.38 to 1.62 per 100,000 (AAPC: -1.82, $p < 0.05$), fluctuating over time. Males experienced higher mortality (AAMR: 2.68) than females (AAMR: 1.52), with males showing a slower rate of decline (AAPC: -1.77 compared to -2.42 in females). Racial disparities were pronounced, with Black/African Americans having the highest AAMR (4.58), followed by Whites (1.79) and Asian/Pacific Islanders (1.04). Geographically, the South had the highest mortality burden (AAMR: 2.03), while the West saw the steepest decline (AAPC: -2.89). Non-metropolitan areas recorded higher mortality rates (AAMR: 2.07) than metropolitan regions (AAMR: 2.02), with rural areas exhibiting a slower decline (AAPC: -1.98 compared to -2.13 in urban areas). State-level variations were notable, with Mississippi (AAMR: 2.60) and the District of Columbia (AAMR: 3.47) having the highest mortality, while Montana (AAMR: 1.39) and New Mexico (AAMR: 1.40) had the lowest. Older adults (65+) faced significantly higher mortality (crude rate: 4.49) than younger populations (45–64: 0.61).



Conclusion

We found that persistent disparities in multiple myeloma and renal disease mortality exist across sex, race, and geography, with rural and Southern regions disproportionately affected. Targeted public health strategies are needed to address these inequities, particularly among high-risk populations.

Keywords

Multiple myeloma; Renal disease; Mortality disparities; Geographic variation; CDC WONDER

AAMR: Age-adjusted Mortality Rate, AAPC: Average Annual Percent Change