Geographical disparities in Leukemia in the United States: Insights from CDC WONDER on Mortality Trends of Leukemia

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Context

Leukemia remains a significant public health concern in the United States, with geographical, racial, and demographic disparities influencing mortality trends. Understanding these variations is critical for targeted interventions and resources.

Objectives

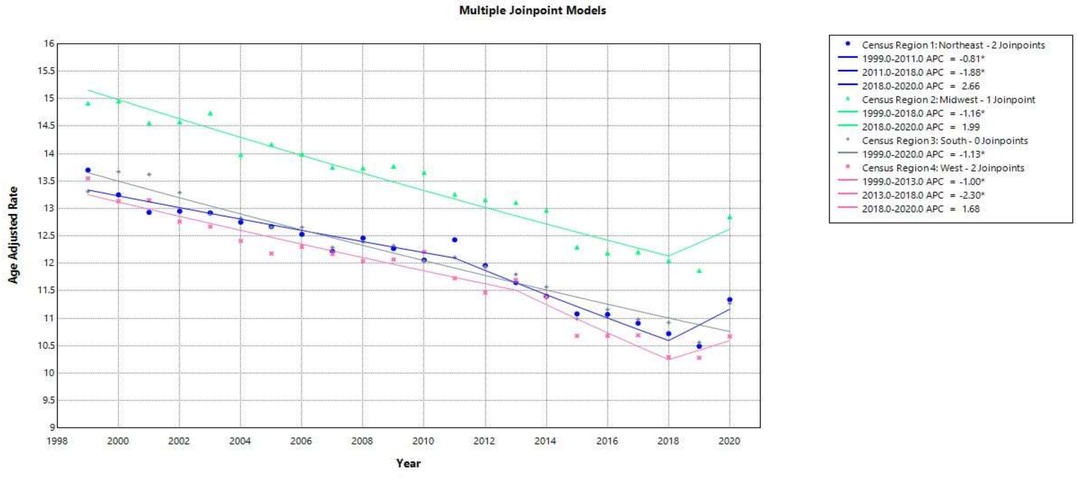
Objective: To evaluates leukemia mortality trends across U.S. census regions, urbanization levels, and demographic groups from 1999 to 2020 to identify disparities and temporal patterns.

Methods

Data on mortality was 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 leukemia. Crude rates and age-adjusted mortality rates (AAMRs) per 100,000 populations were calculated for variables including age, gender, race, and geographic regions. Join point regression analysis was utilized to evaluate annual percentage changes (APC).

Results

Between 1999 and 2020, leukemia mortality rates in the U.S. showed significant declines across all census regions and urbanization levels. In the Northeast, the initial annual percent change (APC) was -0.81% (95% CI: -1.00, -0.62; $p < 0.0001$) from 1999 to 2011, followed by a steeper decline (APC: -1.88% [95% CI: -2.43, -1.32; $p< 0.0001$]) until 2018, after which there was a non-significant increase (APC: 2.66%). The Midwest experienced a steady reduction (APC: -1.16% [95% CI: -1.30, -1.03; $p < 0.0001$]) until 2018, followed by a non-significant rise (APC: 1.99%). The South maintained a consistent downward trend, with an average annual percentage change (AAPC) of -1.13% (95% CI: -1.26, -0.99) between 1999 and 2020. Meanwhile, the West saw an initial APC of -1.00% (95% CI: -1.24, -0.76; $p < 0.0001$), followed by a sharper decline (APC: -2.30% [95% CI: -3.78, -0.80; $p = 0.0055$), and later a non-significant increase (APC: 1.68%). These trends highlight regional variations in leukemia mortality reductions, with most areas experiencing accelerated declines before a recent plateau or slight uptick in some regions.



Conclusion

Leukemia mortality rates declined significantly from 1999 to 2020, with regional and urbanization-level disparities persisting. The Midwest and non-metro areas showed slower declines, highlighting the need for targeted healthcare interventions. Racial and state-level variations underscore the importance of equitable resource distribution in addressing disparities in leukemia outcomes.

Keywords

Leukemia mortality; Trend analysis; Regional disparities; Urban-rural differences; CDC WONDER

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