Temporal Trends and Disparities in Pneumonia-Related Mortality Among Adults With Multiple Myeloma: An Analysis of CDC WONDER (1999–2020)

Authors: Ayesha Khan MBBS[1], Mohamed Fawzi Hemida MBBS[2], Azka Aisha MBBS[1], Mustafa Alsaadi MBBS[3], Krish Patel MBBS[4], Alyaa Ahmed Ibrahim MBBS[2], Zahin Shahriar MBBS[5]

Affiliations: [1]Nishtar Medical University & Hospital, Multan, Punjab, Pakistan. [2]Alexandria University, Alexandria, Alexandria Governorate, Egypt. [3]Jabir Ibn Hayyan University for Medical and Pharmaceutical Sciences, Najaf, Najaf Governorate, Iraq. [4]C. U. Shah Medical College, Surendranagar, Gujarat, India. [5]Dhaka Medical College Hospital, Dhaka, Dhaka, Bangladesh

Keywords

Multiple Myeloma, Septicemia, Epidemiology, CDC WONDER

Context

Pneumonia remains a leading cause of morbidity and mortality among immunocompromised populations, including individuals with multiple myeloma. Understanding long-term trends and demographic disparities can inform preventive strategies and healthcare planning for at-risk populations.

Objectives

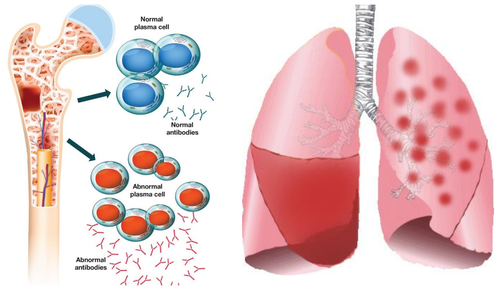
To analyze temporal trends and identify demographic disparities in pneumonia-related mortality among adults aged 45 and older with multiple myeloma in the United States using CDC WONDER data from 1999 to 2020.

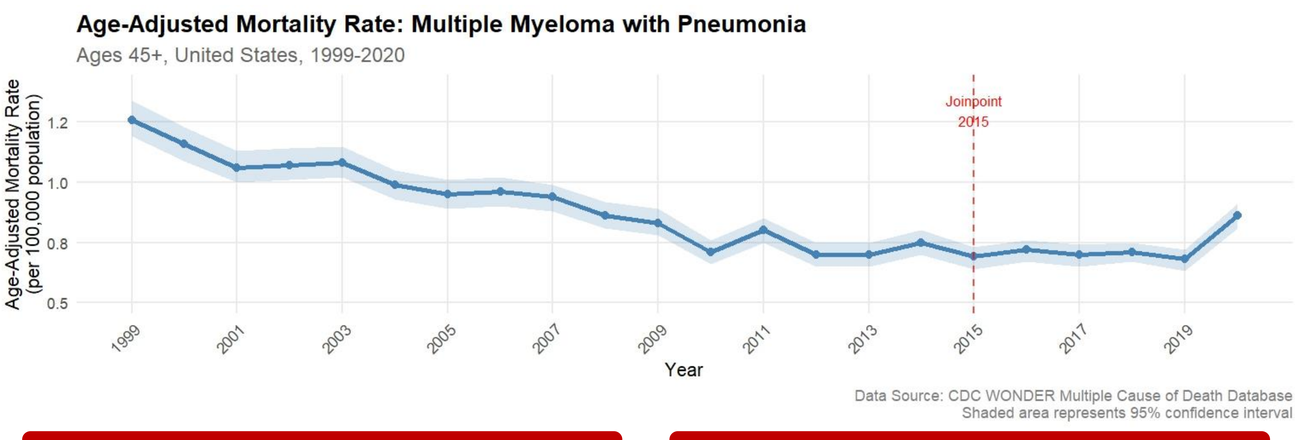
Methods

This retrospective study analyzed death certificate data from the CDC WONDER database (1999–2020), focusing on multiple myeloma (ICD-10: C90.0) and pneumonia (ICD-10: J12–J18) as underlying causes of death in U.S. adults aged +45. Age-adjusted mortality rates were calculated and analyzed using JoinPoint to estimate Annual Percent Change (APC) and Average Annual Percent Change (AAPC). Trends were examined across sex, age groups, race/ethnicity, geographic regions, and metropolitan versus non-metropolitan areas.

Results

From 1999 to 2020, age-adjusted mortality significantly declined with an overall AAPC of -1.96% (95% CI: -2.84 to -1.07). In females, mortality steadily decreased (AAPC= -2.43%, 95% CI: -3.33 to -1.52), while males experienced an initial decline (1999–2015: APC= -4.04%, 95% CI: -4.79 to -3.28); overall trend remained significant (AAPC= -2.15%, P= 0.000248). Regionally, the Northeast had the most consistent decline (AAPC= -2.84%), while the South (AAPC= -1.50%) and West (AAPC= -2.95%) also showed significant reductions. By race/ethnicity, White individuals saw a consistent decline (AAPC= -2.68%). Among age groups, those aged 45–64 had a steady significant decline (AAPC= -2.51%, 95% CI: -3.55 to -1.46), while the 65+ cohort declined initially (1999–2018: APC= -3.30%) but increased thereafter (2018–2020: APC= 14.70%), resulting in an overall decline (AAPC= -1.72%). By urbanization, metropolitan areas showed early decline then plateau (AAPC= -2.36%), while non-metropolitan areas declined before rising post-2017, with an overall significant decrease (AAPC= -2.32%).





Conclusion

Despite overall declining mortality trends, disparities persist by sex, age, region, and race/ethnicity, highlighting the need for targeted strategies to reduce infection-related deaths in multiple myeloma patients.

Acknowledgements

No funding has been received for this study.

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