

Sociodemographic Disparities in DLBCL Mortality in the United States During the Modern Therapeutic Era: A CDC WONDER Analysis, 1999–2024

Ahsun Siddiqi MD¹, Amna Zaheer MBBS², Tehrim Khan MD³, Piyush Ratan MD⁴, Muhammad Ahmed MD³

¹Henry Ford St. John Hospital, Michigan ²Liaquat National Hospital and Medical College, Pakistan ³Henry Ford Macomb Hospital, Michigan ⁴Southern Regional Medical Center, Georgia

Background

- Diffuse large B-cell lymphoma (DLBCL) is the most common subtype of non-Hodgkin lymphoma, accounting for about 30% of the cases in the United States.
- Although advancements in treatment modalities have improved patient outcomes, population-level mortality trends and sociodemographic disparities in the modern therapeutic era remain poorly characterized.
- This study evaluated long-term mortality trends and demographic disparities among patients with DLBCL in the United States.

Methods

- We analyzed US death certificate data from the CDC WONDER database from 1999 to 2024 for adults aged ≥ 25 years with DLBCL (ICD-10 C83.3) listed as the underlying cause of death.
- AAMRs per 100,000 population were calculated. Temporal trends were assessed using Joinpoint regression to estimate APC and AAPC with 95% CIs, stratified by sex, race/ethnicity, US census region, and urban-rural residence.

Overall Mortality Trend

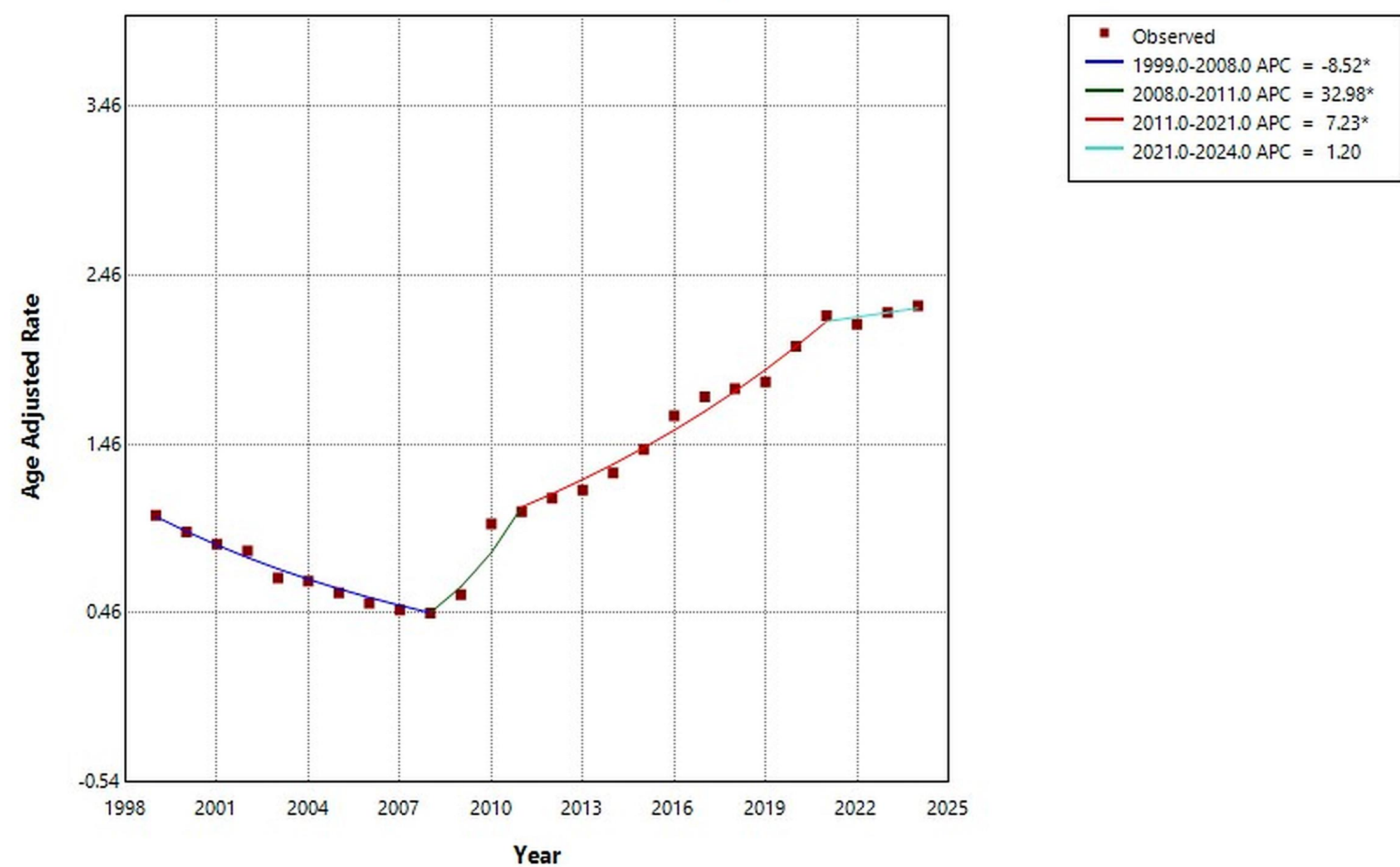


Figure 1. Overall age-adjusted mortality rate of DLBCL in the United States (1999-2024)

Results

- Between 1999 and 2024, 78,387 deaths were identified with DLBCL recorded as the underlying cause of death.
- DLBCL mortality initially declined from 1999 to 2008 (APC, -8.52%; $P < 0.05$), followed by a sharp increase between 2008 and 2011 (APC, 32.98%; $P < 0.05$), and continued to increase through 2021 (APC, 7.23%; $P < 0.05$). Mortality trends then stabilized after 2021 (APC, 1.20%; $P > 0.05$).
- Males consistently demonstrated higher mortality than females throughout the study period, with AAMRs rising to 2.97 among males compared with 1.74 among females by 2024.
- By race/ ethnicity, White individuals demonstrated the highest AAMRs, while African American individuals experienced a significant mortality increase from 2011 to 2019 (APC, 8.42%; $P < 0.05$). Hispanic and Asian or Pacific Islander populations also exhibited significant uptrends in mortality over time.
- Regionally, the Midwest exhibited the highest peak AAMRs. By urbanization, rural areas had the sharpest sustained increase from 2005 to 2020 (APC, 9.02%; $P < 0.05$).

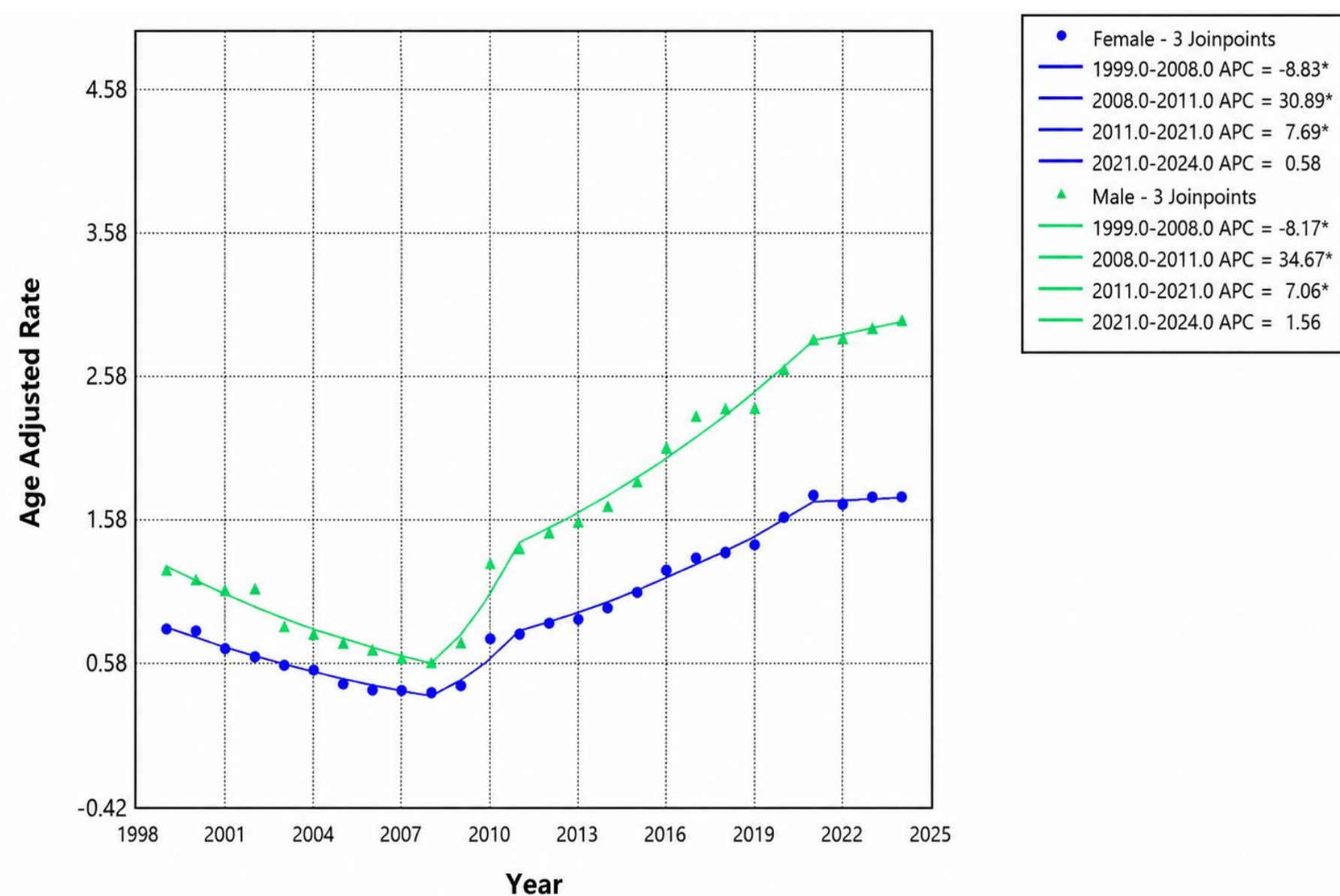


Figure 2. Sex stratified age-adjusted mortality rate of DLBCL in the United States (1999-2024)

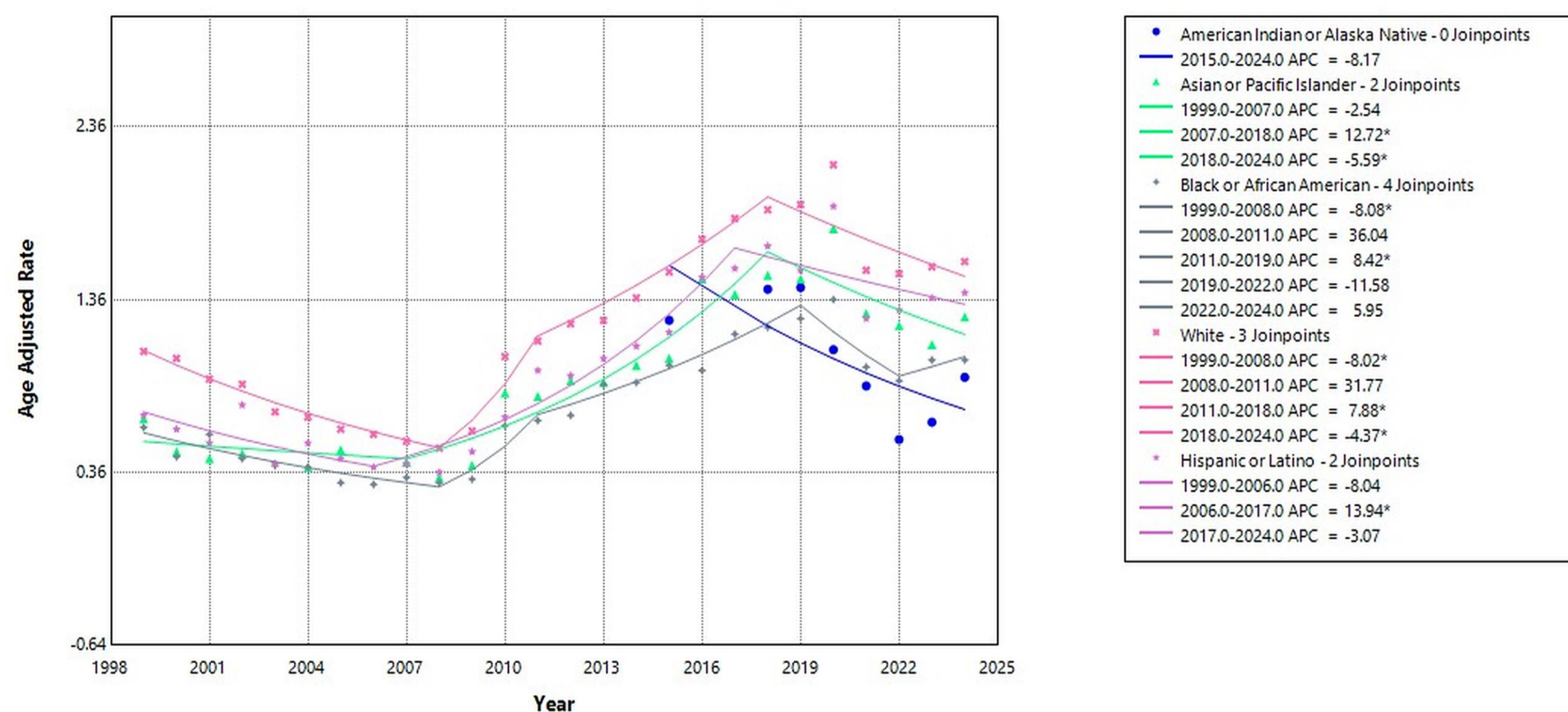


Figure 3. Race stratified age-adjusted mortality rate of DLBCL in the United States (1999-2024)

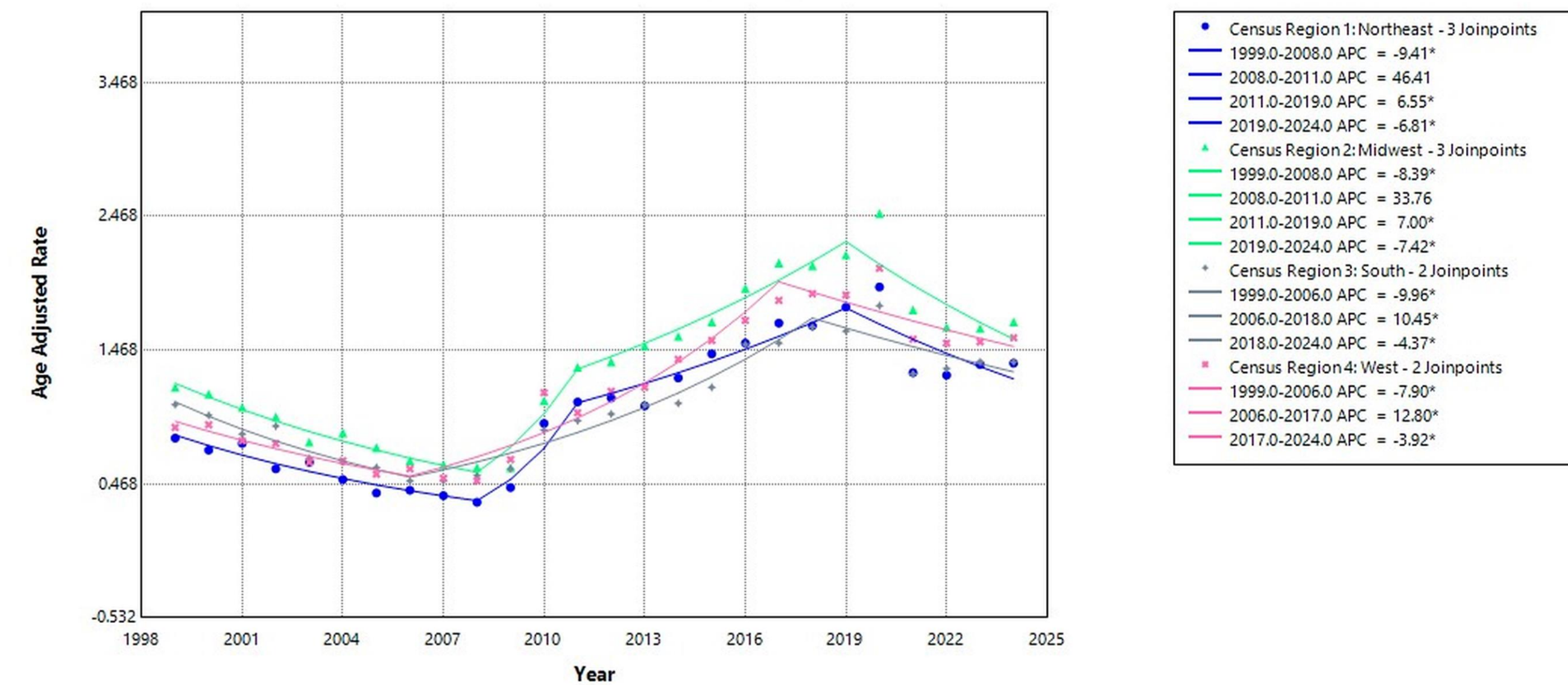


Figure 4. Census region stratified age-adjusted mortality rate of DLBCL in the United States (1999-2024)

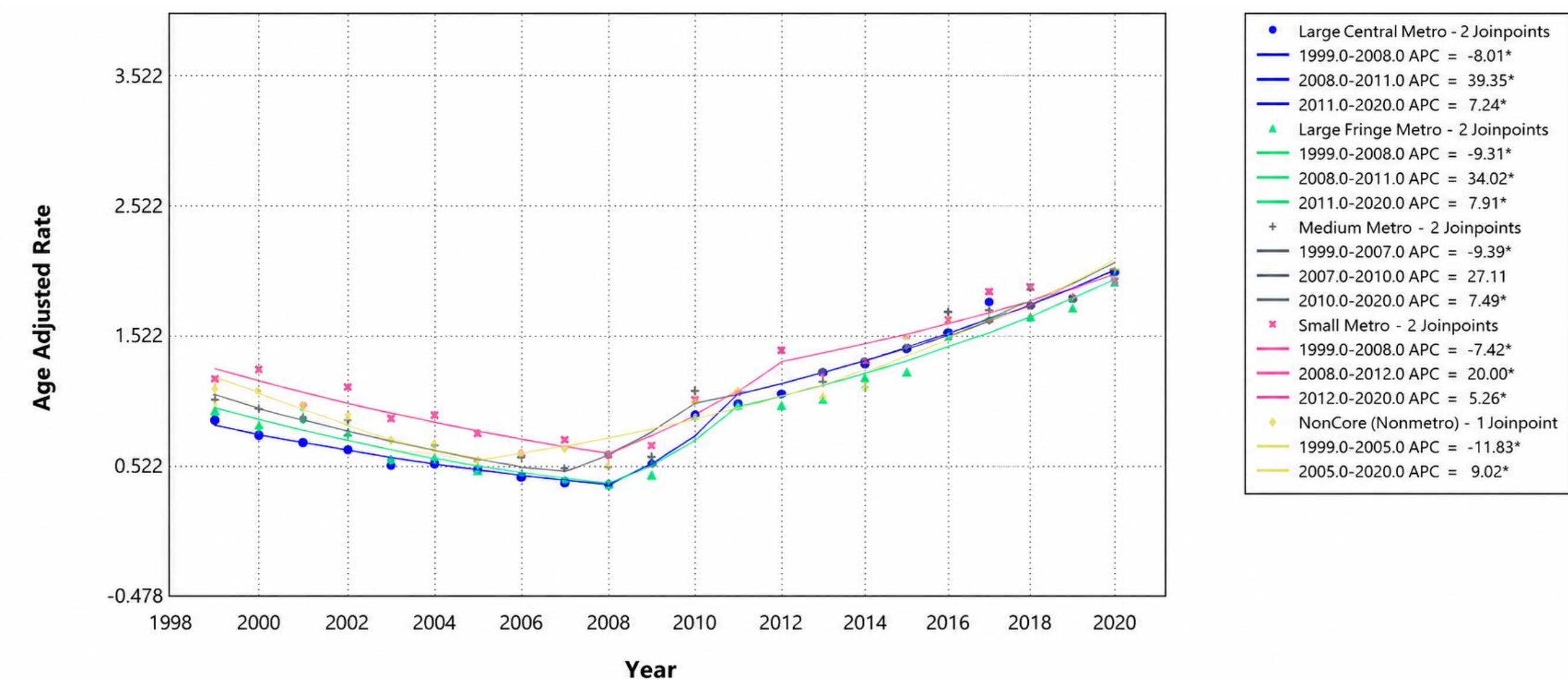


Figure 5. Urbanization-stratified age-adjusted mortality rate of DLBCL in the United States (1999-2020)

Conclusion

DLBCL-associated mortality increased significantly from 2008 to 2021 and stabilized thereafter.

Males, White individuals, and residents of the Midwest had the highest population-level DLBCL mortality rates, while rural populations experienced a marked, sustained increase in mortality over time.

African American, Hispanic or Latino, and Asian or Pacific Islander populations experienced significant upward mortality trends during specific periods.

Future Directions for Research

Further studies should investigate the drivers of regional and racial disparities in DLBCL mortality and address barriers to equitable access to advanced therapies such as CAR T-cell therapy.

References

- Sehn LH, Salles G. Diffuse Large B-Cell Lymphoma. *N Engl J Med*. 2021;384(9):842-858.
- Centers for Disease Control and Prevention, National Center for Health Statistics. CDC WONDER Online Database: Underlying Cause of Death, 1999–2024. Available at wonder.cdc.gov

Abbreviations:
AAMR: age-adjusted mortality rate; AAPC: average annual percent change; APC: annual percent change.