

Trends in Acute Lymphoblastic Leukemia–Related Mortality Among U.S. Adults Aged ≥25 Years: A CDC WONDER Analysis, 1999–2024

MZ Anwar¹, H. Tahir², RI. Waheed²

¹Internal Medicine, Greater Baltimore Medical Center, Towson, MD, ² Internal Medicine, University of South Dakota, Sioux Falls, SD.



Introduction

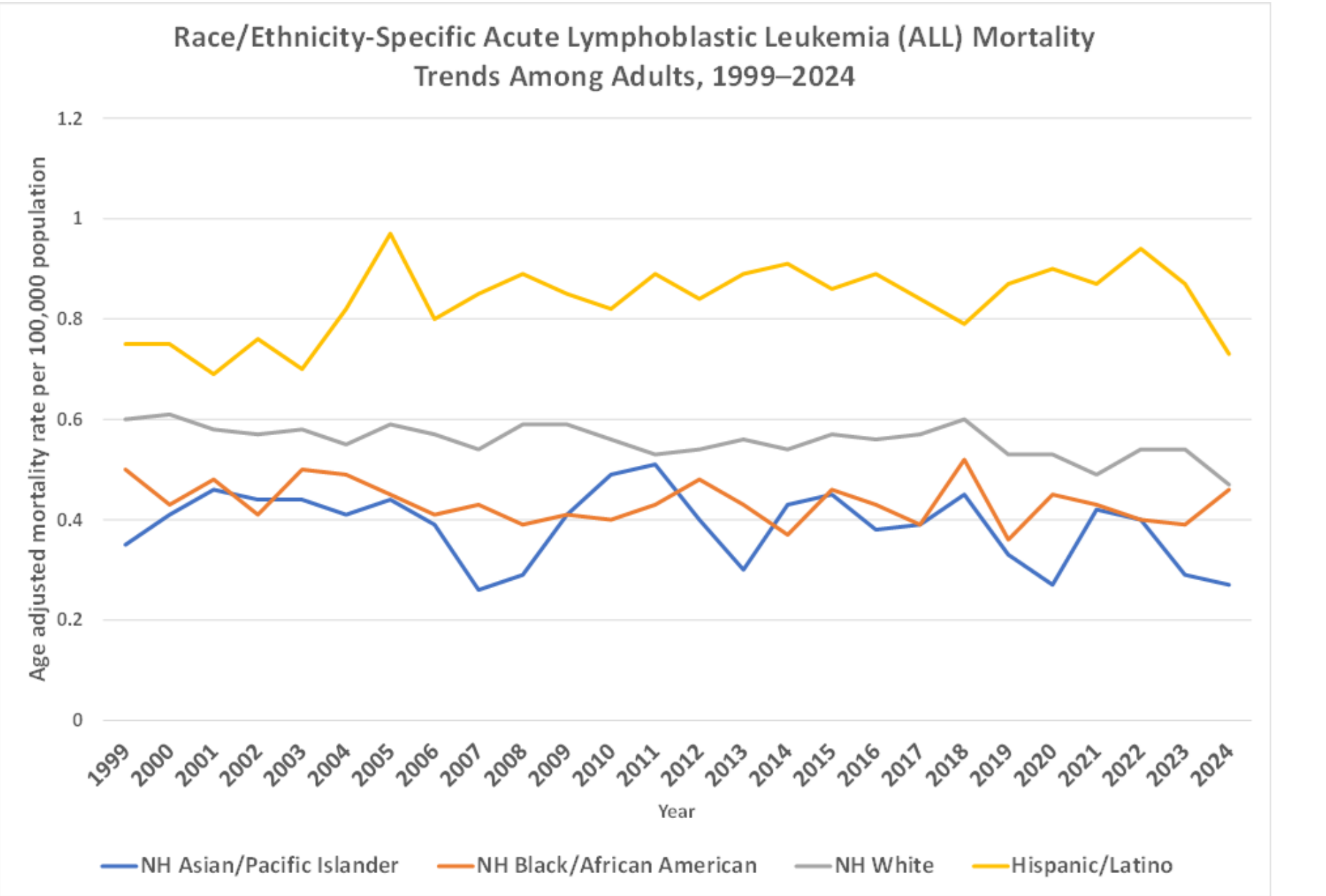
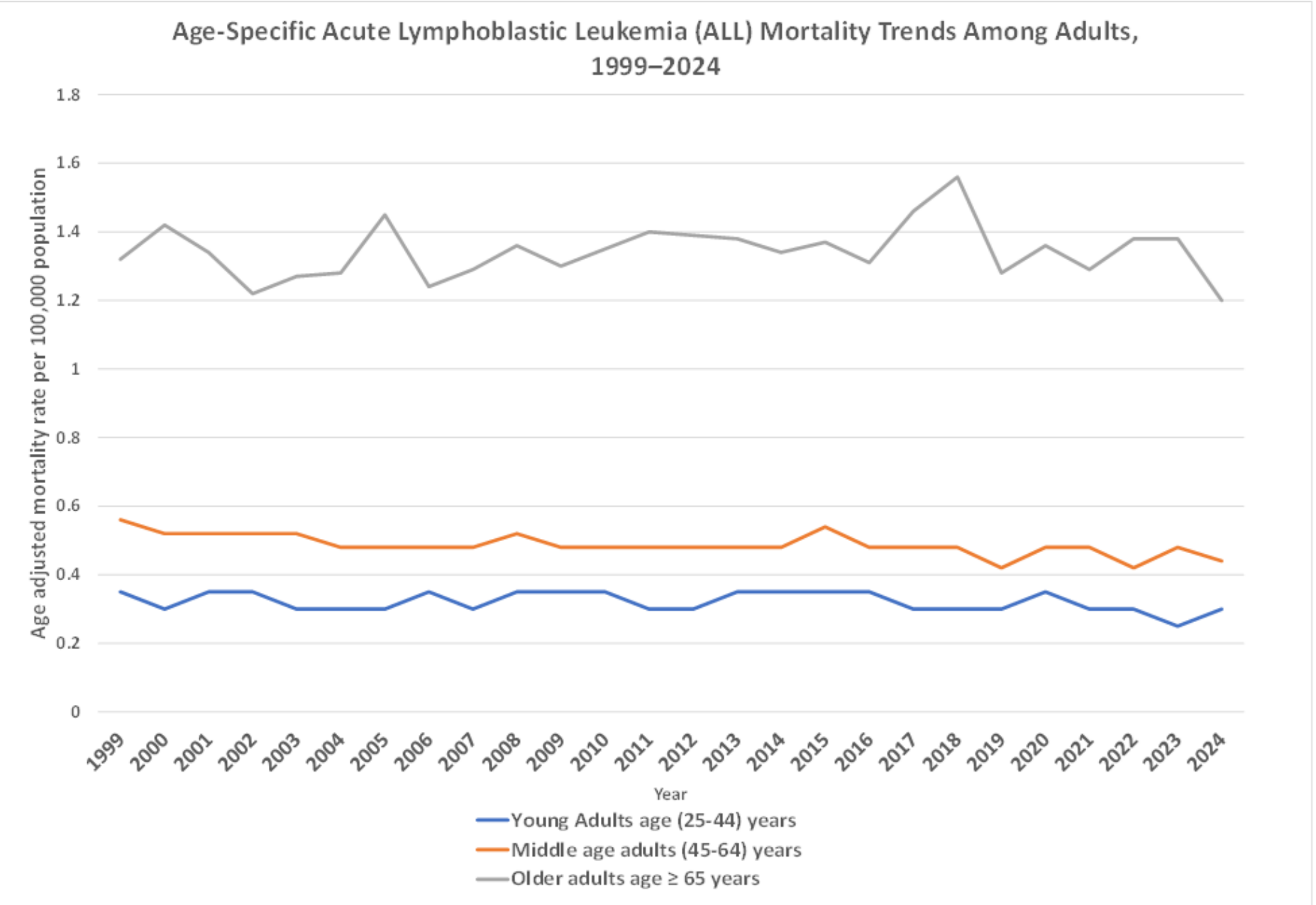
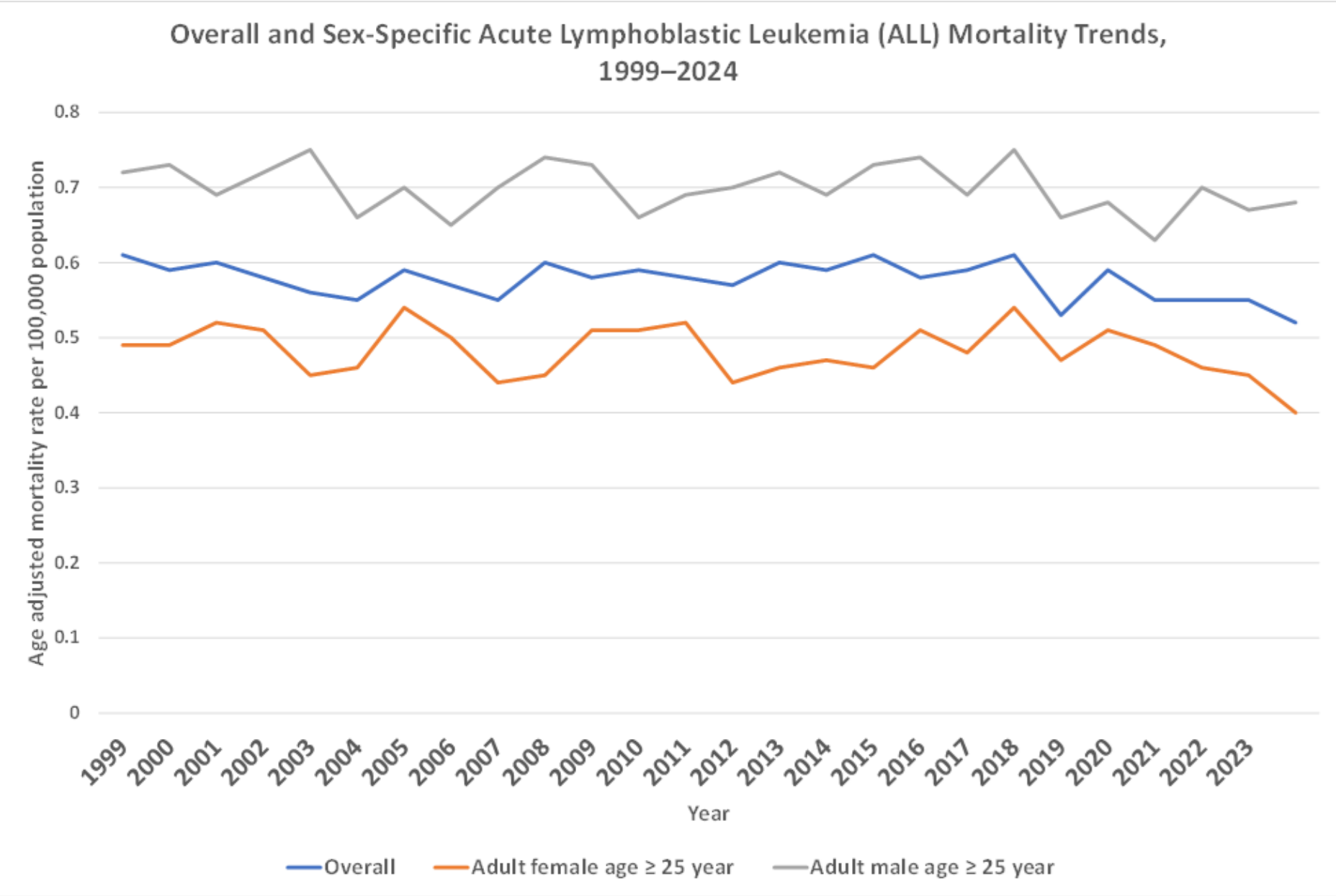
- Acute lymphoblastic leukemia (ALL) remains associated with substantial mortality in adults despite therapeutic advances. We evaluated long-term mortality trends and demographic disparities in ALL-related deaths among U.S. adults aged ≥25 years.

Methods

- We conducted a retrospective population-based study using the CDC WONDER Multiple Cause of Death database from 1999 to 2024.
- ALL-related mortality was identified using the ICD-10 code C91.0.
- Age-adjusted mortality rates (AAMRs) per 100,000 population were analyzed using Joinpoint regression to calculate annual percent change (APC) and average annual percent change (AAPC) with 95% confidence intervals (CI).

Results

- Total deaths (1999–2024): 32,613; average AAMR: 0.57; AAPC: –0.41%.
- Joinpoint: Mortality was stable during 1999–2018 (APC: +0.07%) followed by a significant decline during 2018–2024 (APC: –1.92%).
- Age-stratified: Middle-aged adults (45–64 years) had a significant mortality decline (AAPC: –0.54%), while older adults (≥65 years) had persistently elevated mortality (average AAMR: 1.34) without significant improvement.
- Race/Ethnicity: NH White individuals had a significant mortality decline (AAPC: –0.49%), while trends among Black and Asian/Pacific Islander individuals were not statistically significant. Hispanic individuals experienced increasing mortality during 1999–2022 (APC: +0.69%), followed by a sharp decline after 2022 (APC: –9.34%).
- Census Region: The Northeast had the largest mortality decline (AAPC: –1.29%), with a particularly marked reduction after 2018 (APC: –4.50%).
- Overall trend: Mortality declined from 0.61 in 1999 to 0.52 in 2024, with the most substantial improvement occurring after 2018.



Conclusion

ALL-related mortality among U.S. adults has modestly declined over the past 25 years, with accelerated improvement after 2018. Persistent age-, racial-, and regional disparities remain, particularly among older adults and minority populations, highlighting the need for equitable access to advances in ALL diagnosis and treatment.