

TRENDS IN PNEUMONIA-RELATED MORTALITY AMONG PATIENTS WITH HEMATOLOGICAL MALIGNANCIES IN THE UNITED STATES, 1999–2020: A CDC WONDER POPULATION-BASED ANALYSIS

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INTRODUCTION

Hematological malignancies confer profound immunosuppression, predisposing patients to life-threatening infectious complications. Pneumonia remains a leading cause of mortality in this immunocompromised population.

AIM

To characterize temporal trends in pneumonia-related mortality among patients with hematological malignancies from 1999 to 2020, stratified by sex, race, and census region, using Joinpoint regression analysis.

METHOD

We analyzed the CDC WONDER Multiple Cause of Death database for U.S. decedents with co-listed hematological malignancies (ICD-10 C81-C96) and pneumonia (J09-J18), 1999-2020. Age-adjusted mortality rates (AAMRs) per 100,000 were stratified by sex, race/ethnicity (White, Black/African American, Asian/Pacific Islander, Hispanic/Latino), and U.S. Census region. American Indian/Alaska Native data were excluded due to unreliable annual estimates. Annual percentage change (APC) was estimated using the NCI Joinpoint regression program (P < .05).

CONCLUSIONS

Pneumonia-related mortality in patients with hematological malignancies declined significantly across all subgroups from 1999-2018. A uniform 2018 inflection underscores the COVID-19 burden on this immunocompromised population. The nonsignificant rise in the West and the uninterrupted decline among Asian/Pacific Islander patients warrant further investigation. Persistent sex and racial disparities highlight the need for targeted preventive strategies.

RESULTS

A total of 121,182 deaths occurred (72,532 male; 48,650 female) among patients with hematological malignancies and pneumonia, 1999-2020. All subgroups declined significantly from 1999 to 2018, followed by a sharp reversal from 2018 to 2020 coinciding with the COVID-19 pandemic. Male patients had consistently higher AAMRs than female patients (1999: 5.17 vs 2.46; 2020: 3.69 vs 1.68 per 100,000). Asian/Pacific Islander patients were the only racial group with an uninterrupted decline across the full study period (APC - 2.15%); all other groups showed a 2018 inflection, with the steepest post-2018 rise among Hispanic/Latino patients (APC +21.68%). Regionally, the 2018-2020 rise was significant in the Northeast, Midwest, and South, but not in the West (APC +7.61%).

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REFERENCES

1. Fedeli U, Barbiellini Amidei C, Han X, Jemal A. Changes in mortality associated with different hematologic malignancies during the pandemic in the United States. *Int J Cancer*. 2024;155(1):32-40.

2. Vijenthira A, Gong IY, Fox TA, et al. Outcomes of patients with hematologic malignancies and COVID-19: a systematic review and meta-analysis of 3377 patients. *Blood*. 2020;136(25):2881-2892.

3. Kirtane K, Lee SJ. Racial and ethnic disparities in hematologic malignancies. *Blood*. 2017;130(15):1699-1705.

4. Certan M, Garcia Garrido HM, Wong G, Heijmans J, Grobusch MP, Goorhuis A. Incidence and predictors of community-acquired pneumonia in patients with hematological cancers between 2016 and 2019. *Clin Infect Dis*. 2022;75(6):1046-1053.

5. Data source: CDC WONDER Multiple Cause of Death database, National Center for Health Statistics, Centers for Disease Control and Prevention, Atlanta, GA. Trend analyses performed with the National Cancer Institute Joinpoint Regression Program.

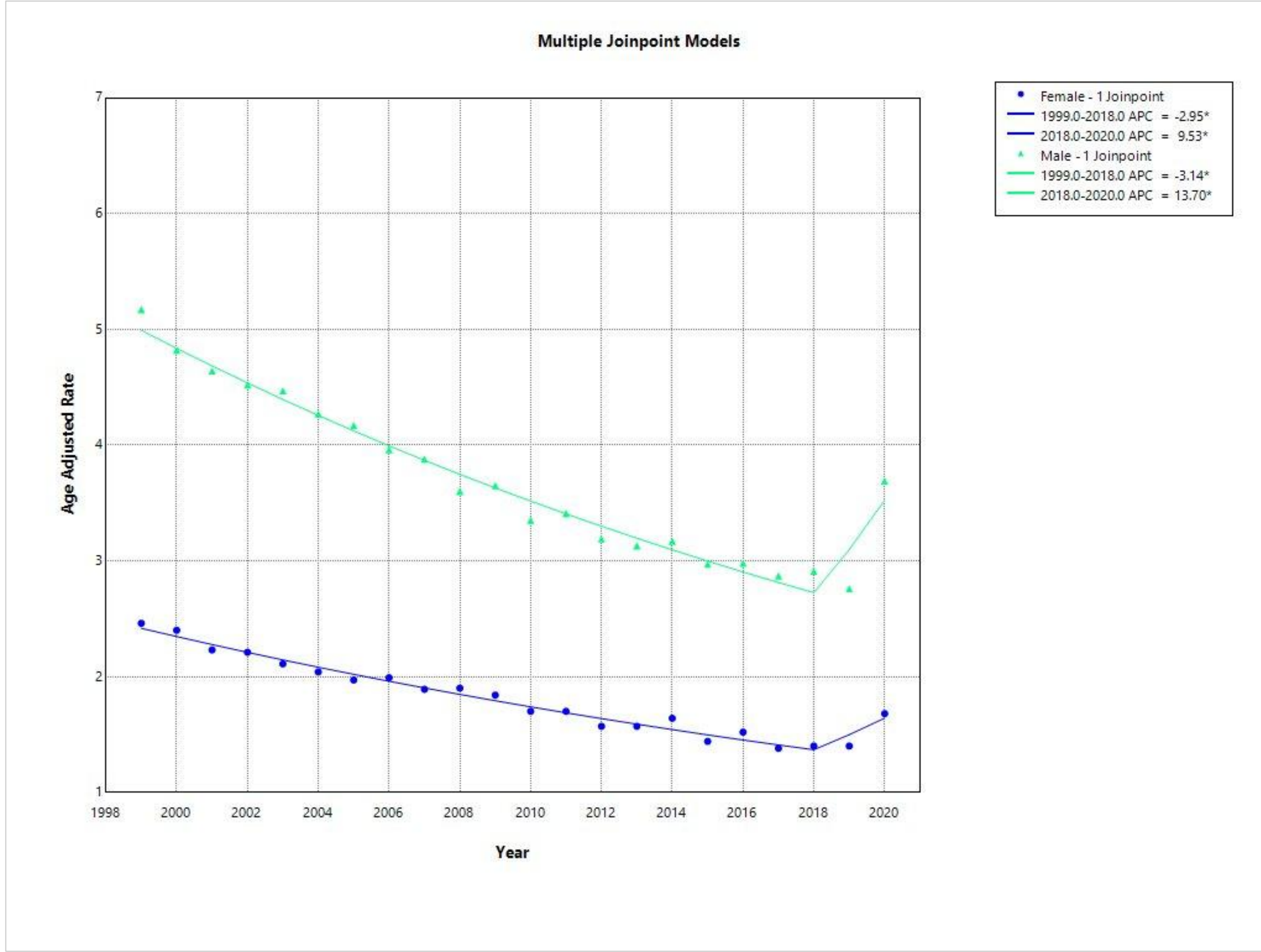


Figure 1. Age-adjusted pneumonia mortality rate by sex, 1999–2020.

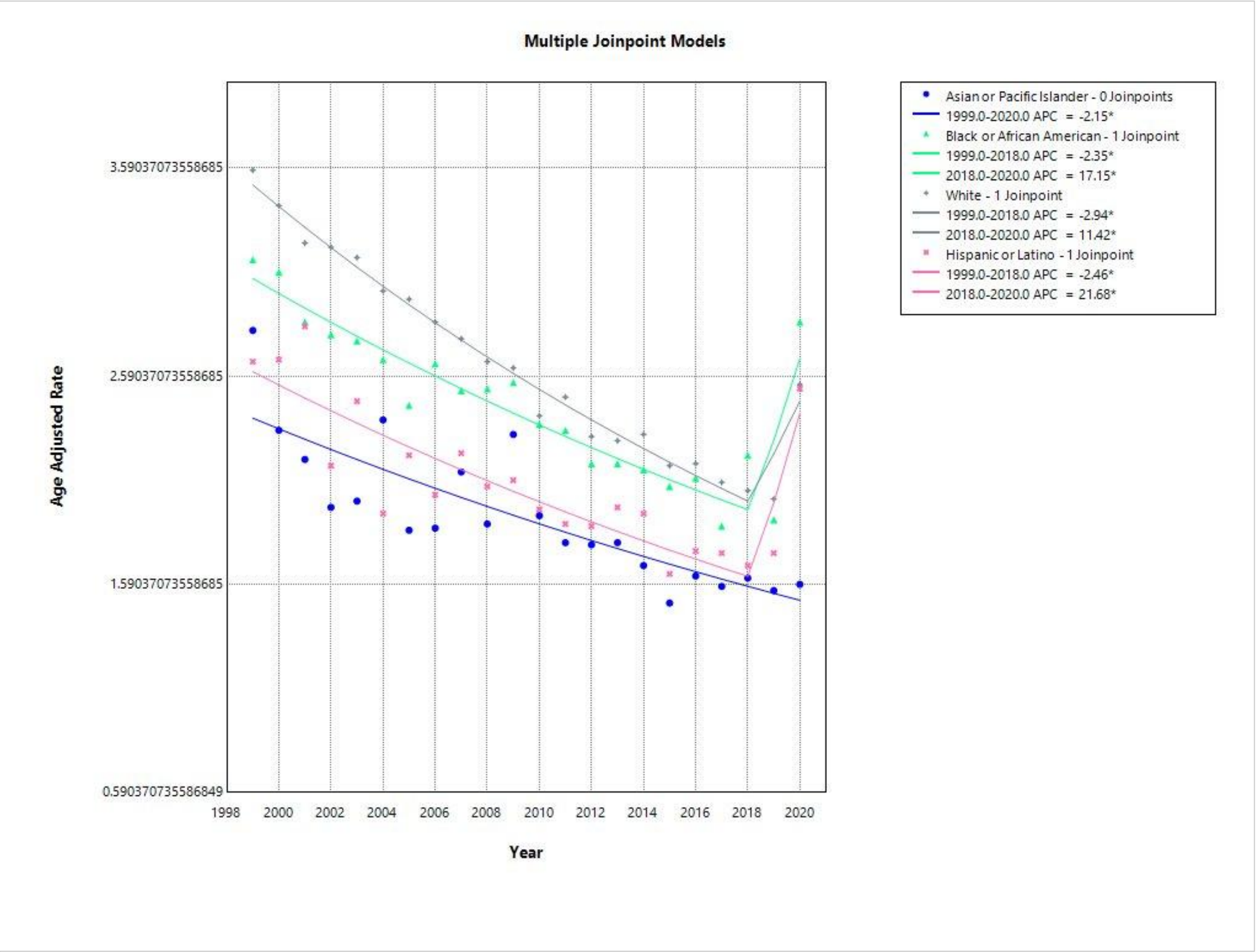


Figure 2. Age-adjusted pneumonia mortality rate by race/ethnicity, 1999–2020.

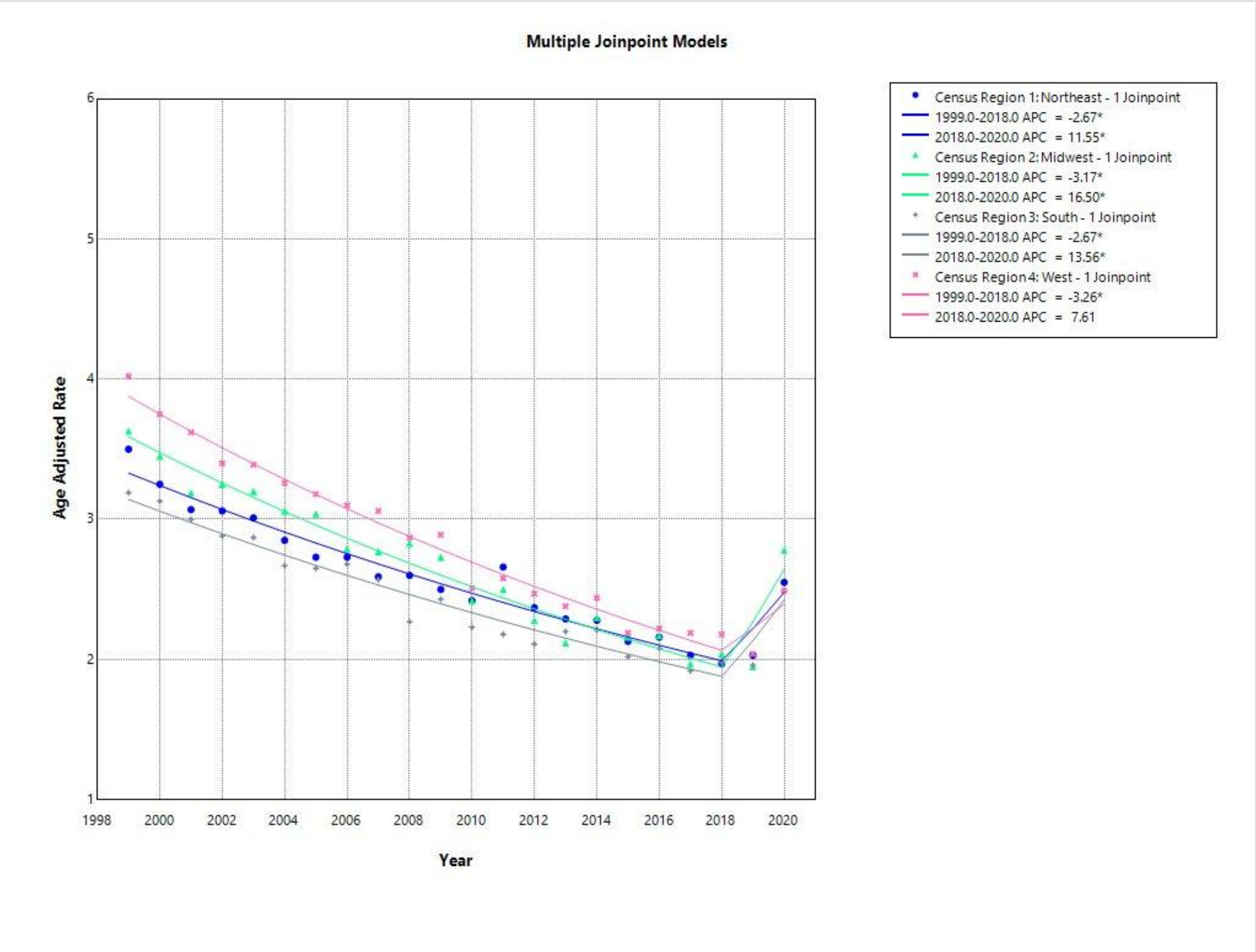


Figure 3. Age-adjusted pneumonia mortality rate by US Census region, 1999–2020.