Trends in Cancer and Pulmonary Embolism Related Mortality (1999–2023): A CDC Wonder Database Analysis

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INTRODUCTION

- Cancer significantly increases the risk of developing pulmonary embolism (PE), mainly due to a hypercoagulable state induced by malignancy, prolonged immobility, and complications arising from cancer therapies such as chemotherapy and surgery.
- Pulmonary embolism remains a significant cause of death among patients with cancer, complicating its prognosis and management. However, understanding mortality patterns over time can provide valuable insights into healthcare disparities, disease burden, and the effectiveness of preventative strategies.

METHOD

- Data from the Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiologic Research (CDC WONDER) database (1999- 2023) included middle-aged (45-64 years) and older adults (65-85+ years) diagnosed with Cancer and PE. Death records were specified using the International Classification of Diseases, Tenth Revision (ICD-10) codes C00-C97 and I26 for cancer and PE, respectively.
- Data was extracted for demographics such as population, year, sex, age group, and place of death while, geographically, we considered states regions, and urbanization. Crude and age-adjusted mortality rates (AAMRs) per 100,000 population were calculated and analyzed, and trends in AAMRs were examined using joinpoint regression to calculate the annual percent change (APC).

FIGURES

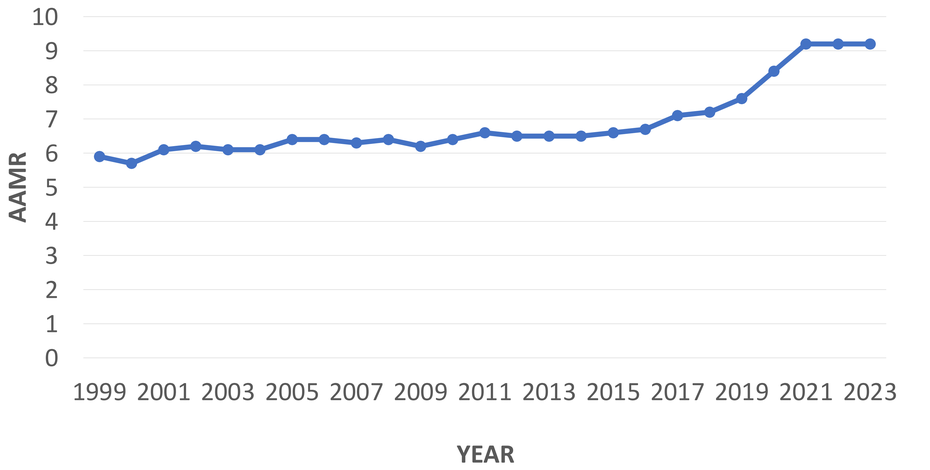

Figure 1. Overall, trends in Cancer and PE-related age-adjusted mortality rates per 100,000 among middle aged (45-64 years) and older adults aged (65-85+ years) in the United States, 1999 to 2023.

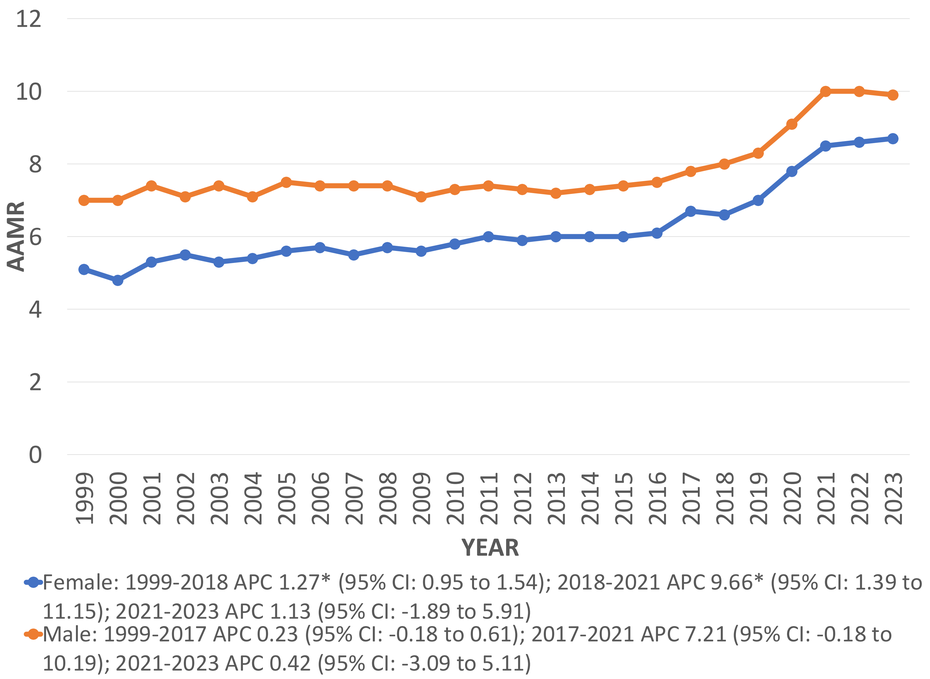

Figure 2. Sex stratified trends in Cancer and PE-related age-adjusted mortality rates per 100,000 among middle aged (45-64 years) and older adults aged (65-85+ years) in the United States, 1999 to 2023.

RESULTS

- From 1999 to 2023, Cancer and PE accounted for 214,455 deaths, with AAMRs rising from 5.9 to 9.2. AAMRs rose significantly from 1999 to 2017 (APC 0.73), increasing massively up to 2021 (APC 7.63), then remained stable till 2023 (Figure 1).
- Males had a higher AAMR of 7.8 than females at 6.2. The highest AAMR was found among NH African Americans (10.3) compared with other races/ethnicities. Rates were also notably high in non-metropolitan areas (6.8) and the Midwest regions (7.4) (Figure 2).

CONCLUSIONS

- The rising mortality from cancer-associated PE, especially from 2017 to 2021, highlights an urgent need for targeted public health strategies. Demographic disparities including higher rates among males, African Americans, rural populations, and Midwest residents underscore systemic healthcare inequalities that must be addressed.
- Interventions should focus on increasing awareness, improving access to diagnostic and preventive services, and ensuring equitable cancer care delivery across all regions and populations. Future research should explore the underlying causes of these disparities and evaluate the impact of emerging cancer therapies and thromboprophylaxis protocols on PE-related outcomes.

REFERENCES

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2. Li Y, Shang Y, Wang W, Ning S, Chen H. Lung Cancer and Pulmonary Embolism: What Is the Relationship? A Review. J Cancer. 2018 Aug 6;9(17):3046-3057. doi: 10.7150/jca.26008.