

Title: *Bladder Cancer Mortality in Alabama (1999–2020): A County-Level Analysis of Racial and Sex-Based Disparities*

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Background: Bladder cancer is the 10th leading cause of Death in the USA (1,2), which is the most urologically significant malignancy with direct implications for kidney and urinary tract health. Population-level mortality data stratified by race and sex can reveal structural inequities that inform both clinical care and health policy, but data from Alabama are very scarce from Alabama. The goal of this study is to evaluate the county-level bladder cancer mortality across Alabama over 21 years.

Methods: Death certificate data were obtained from the CDC WONDER Underlying Cause of Death database (ICD-10 codes C67.0–C67.9) for the state of Alabama from 1999 to 2020. Data encompassing 51 counties were stratified by race (White; African American) and sex, with crude mortality rates and age-adjusted rates (AAR) calculated per 100,000 population. Counties with fewer than 10 deaths were classified as statistically unreliable per CDC suppression standards.

Results: We found total of 4,053 bladder cancer deaths recorded across a cumulative population of approximately 79.9 million person years. The overall crude mortality rate was 5.07 per 100,000. Men accounted for 73.2% of all deaths, representing a male-to-female ratio of 2.7:1. White individuals comprised 90.3% of total deaths (n=3,659), while African American individuals accounted for 9.7% (n=394). However, age-adjusted mortality rates revealed a more complex picture: White males carried the highest AAR (7.92), while African American males demonstrated markedly elevated rates relative to African American females (AAR 5.03 vs. 2.10), suggesting significant sex-based vulnerability within this group. Jefferson County recorded the highest county-level burden (623 deaths).

Conclusions: Bladder cancer mortality in Alabama Countys showed pronounced sex and racial disparities, with White males bearing the greatest absolute burden and African American males showing disproportionate age-adjusted risk, with possible unreliable data given the disproportionate burden. These findings suggested the need for targeted urological screening protocols in high-risk communities and individuals. Also, further research studies should be done to find out if any specific risk factors contribute to this high number of disparities.

References: 1. SEER Preliminary Cancer Incidence Rate Estimates for diagnosis years 2000 to 2023, National Cancer Institute, Bethesda, MD, <https://seer.cancer.gov/statistics/preliminary-estimates/> , based on the February 2025 SEER data submission. Posted to the SEER web site and SEER Explorer, July 2025.

2. American Cancer Society. 2026. "Key Statistics for Bladder Cancer." American Cancer Society. <https://www.cancer.org/cancer/types/bladder-cancer/about/key-statistics.html> .