



Racial Disparities in Mortality Proportion from Acute Renal Failure:
A Population-Based Analysis Using U.S. Mortality Data, 2018–2023



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Objective

Acute renal failure (ARF) remains a significant contributor to mortality in the United States. Racial disparities in outcomes from ARF have not been fully elucidated at the population level. This study aims to quantify and compare the mortality proportions from ARF across three major racial groups: Asian, Black or African American, and White, using U.S. national mortality data.

Materials and Methods

Mortality data from the CDC WONDER database (2018–2023) for adults aged 18 and older were analyzed. Deaths with ICD-10 code N17 were matched to all-cause deaths by age, sex, and race, focusing on Asians, Black or African Americans, and Whites. Unadjusted mortality proportions were calculated as ARF deaths divided by all-cause deaths within each group. Age- and gender-adjusted mortality proportions were obtained via direct standardization using the overall age-sex death distribution as the standard population. Group differences were tested with the z-test. Analyses were performed in RStudio.

Results

Race	N (%)	Age	Male
All	100	66.7±14.2	57.6%
White	82.36	67.4±13.8	57.8%
Black or African American	15.10	62.6±15.3	56.8%
Asian	2.54	67.2±14.2	57.5%

Acknowledgement

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Results

Race	Deaths	Deaths from Acute Renal Failure	Unadjusted mortality proportion*	Adjusted mortality proportion**
All	12,944,911	39,500	0.31% (0.30, 0.31)†	0.31% (0.30, 0.31)†
White	10,661,045	32,285	0.30% (0.30, 0.31)†	0.30% (0.30, 0.30)†
Black or African American	1,954,825	6,667	0.34% (0.33, 0.35)†	0.37% (0.36, 0.37)†
Asian	329,041	548	0.17% (0.15, 0.18)†	0.16% (0.15, 0.18)†

Table 2. Mortality Proportion from Acute Renal Failure by Race
* Pairwise comparisons of unadjusted ARF mortality proportions: White vs Black (p < 0.01), White vs Asian (p < 0.01), Black vs Asian (p < 0.01)
** Pairwise comparisons of ARF mortality proportions adjusted for age and gender: White vs Black (p < 0.01), White vs Asian (p < 0.01), Black vs Asian (p < 0.01)
† 95% Confidence Interval

A total of 12,944,911 adult deaths were analyzed, including 39,500 deaths from ARF (0.31%). Black or African American individuals consistently exhibited the highest mortality proportion from ARF, both before and after adjustment for age and gender. Unadjusted and adjusted pairwise comparisons of ARF mortality proportions were all statistically significant

Discussion and Conclusions

Significant racial disparities exist in mortality proportions from acute renal failure in the U.S. population. Black or African American individuals have a disproportionately higher risk of death from ARF compared to Asians and Whites, even after adjusting for age and gender.

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