

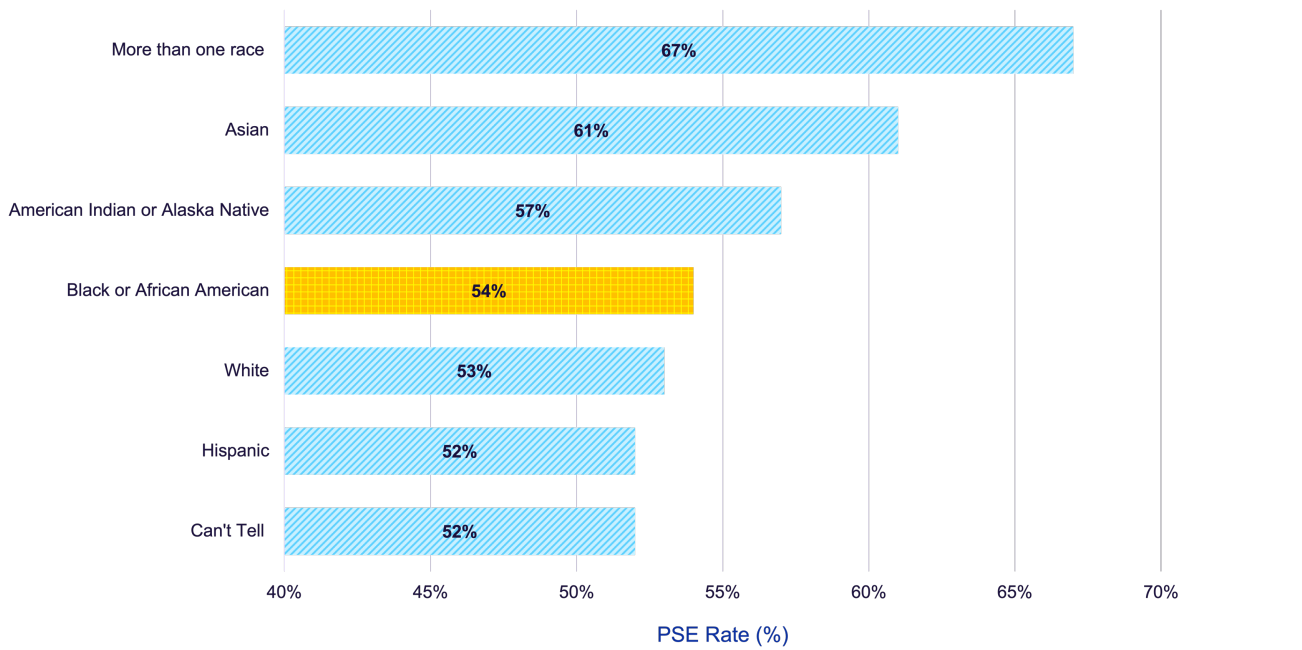
The Relationship Between Health Equity and Patient Safety Among Medicare Beneficiaries

Introduction

The Beneficiary and Family Centered Care National Coordinating Oversight and Review Center (BFCC NCORC) screening of Medicare medical records between October 2020 and December 2021 identified a comparable patient safety event (PSE) rate between Black and White beneficiaries.¹ Similar findings have been observed in prior literature.²

We conducted an analysis to investigate why Black beneficiaries exhibit a similar or lower PSE rate than White beneficiaries and to determine whether disparities may exist when comparing age, health literacy, and socioeconomic differences. Our goal was to shed light on the underlying factors contributing to PSE outcomes by race and identify potential avenues for targeted improvements in patient safety research.

Unweighted Patient Safety Event Rate by Race



Methods

A total of 4,000 medical records between October 2020 and December 2021 were reviewed by the BFCC NCORC to identify potential PSEs.

Age, illness severity, health literacy, and area deprivation were selected as potential factors affecting the relationship between race and PSE risk.

Illness severity was approximated by diagnosis-related group (DRG), a patient classification scheme designed to link the severity of illness, prognosis, treatment difficulty, need for intervention, and resource intensity.³ For this analysis, total counts of each diagnosis linked to a DRG per ZIP Code were tallied; Centers for Medicare & Medicaid Services (CMS) national DRG relative weights from 2005 were applied to these counts.⁴

Health literacy estimates were based on the 2003 National Assessment of Adult Literacy, which had tasks designed to specifically measure health literacy in adults in the United States.⁵

The 2020 national **Area Deprivation Index (ADI)** estimates were used to rank neighborhoods by socioeconomic disadvantage, based on income, education, employment, and housing quality.⁶

Data Analysis

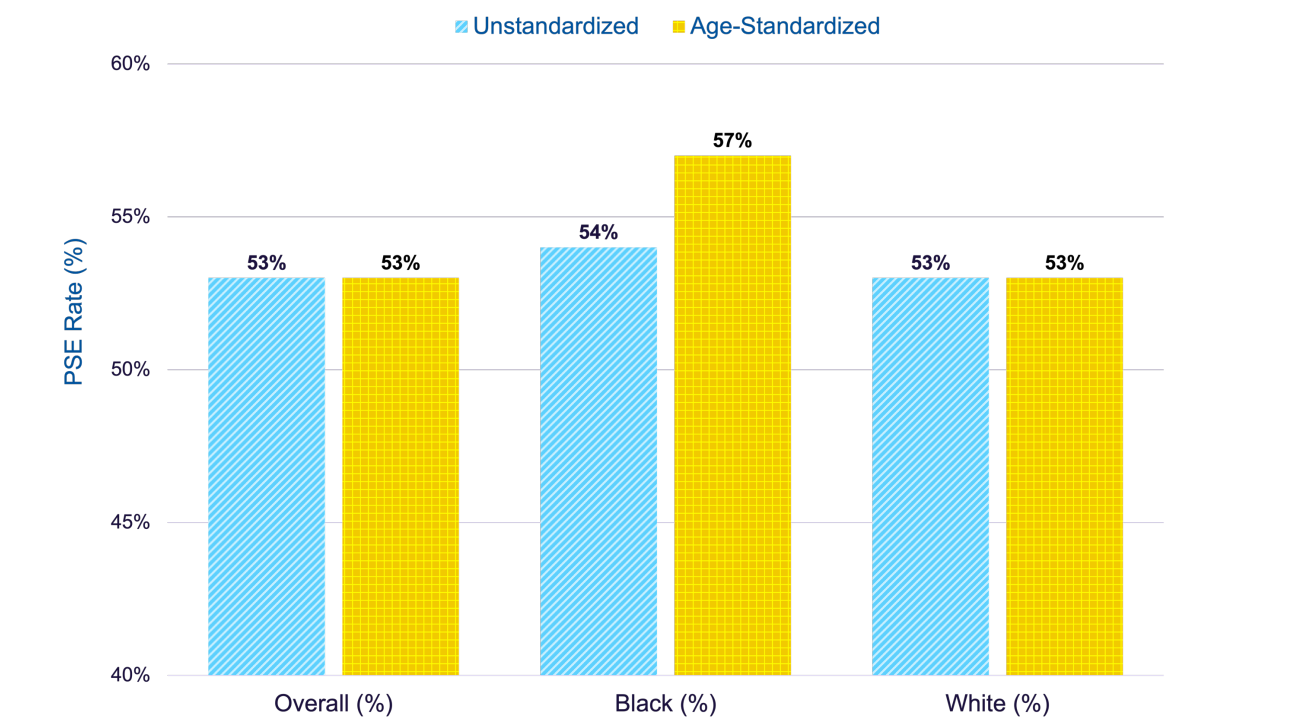
- This analysis is intended to:
1. Assess and quantify PSE rates among Black and White beneficiaries.
 2. Identify possible factors that may contribute to disparities in PSE rates between Black and White beneficiaries.
 3. Better understand the interplay of factors influencing patient safety outcomes among Black and White beneficiaries.

Results

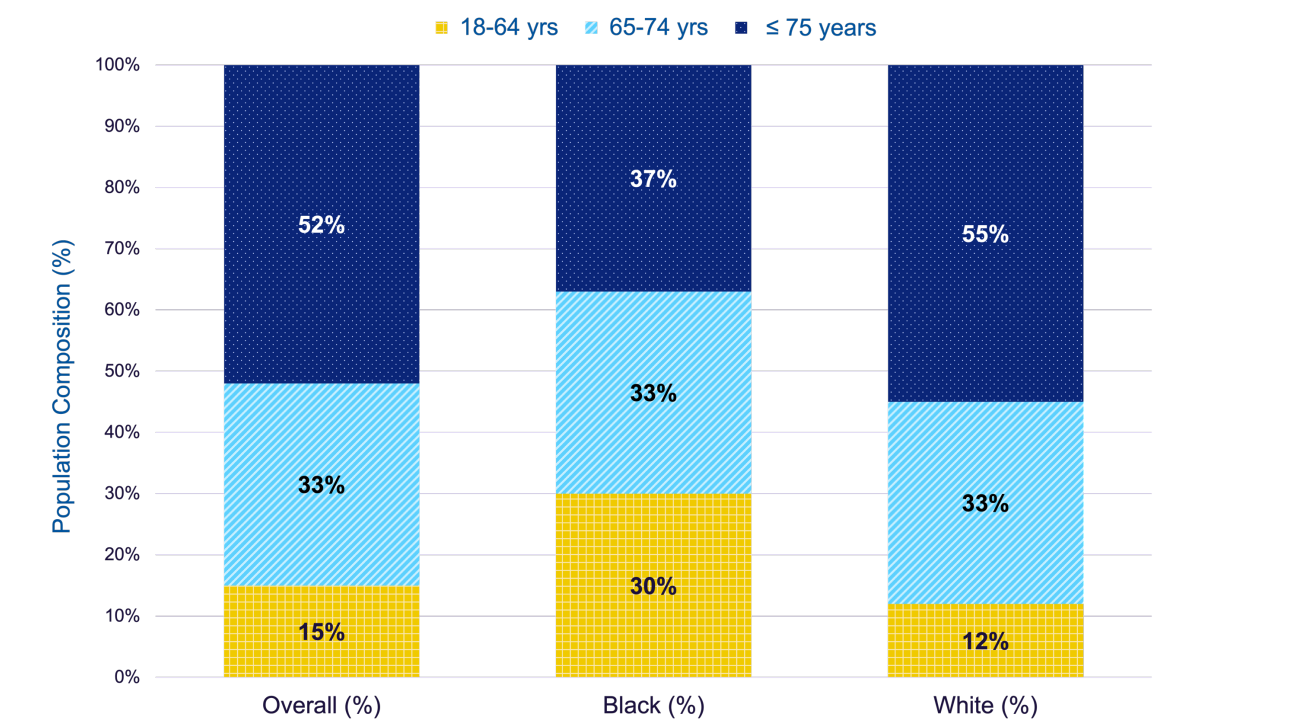
Patient Safety Event Rate by Race and Age Group

Age Group	Overall N=3,469	Black N=506	White N=2,963
18–64 years	50%	47%	49%
65–74 years	50%	53%	49%
≥75 years	57%	62%	56%
P-values	<0.001	0.022	0.003

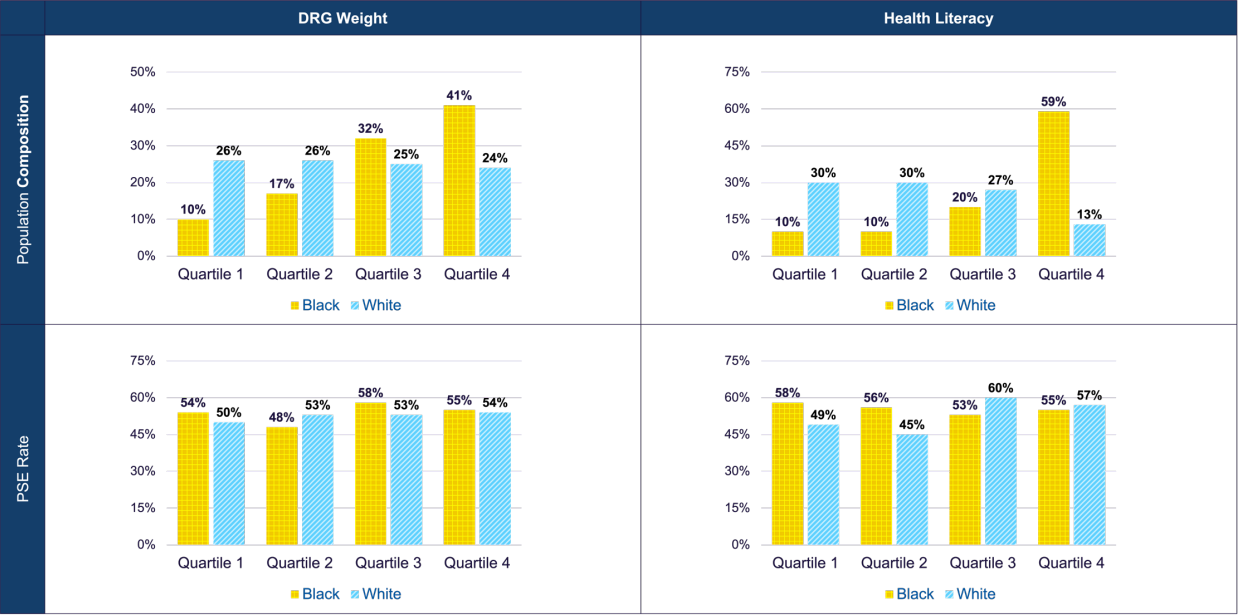
Age-Standardized PSE Rate by Race



Age Distribution by Race



Potential Factors in Relation to Race and Patient Safety Event



Key Findings

The median age was 69 years for Black beneficiaries and 75 years for White beneficiaries. This mirrors national data on life expectancy, where Black individuals have a life expectancy of 71 years and White individuals have a life expectancy of 76 years.⁷

PSE rate increased with advancing age. The relatively large proportion of younger Black beneficiaries and the relatively small proportion of older Black beneficiaries lowered the overall PSE rate for the entire racial cohort.

On average, Black beneficiaries were more likely to live in areas with higher average DRG weight and lower health literacy scores than White beneficiaries. However, PSE rates did not vary significantly across DRG weight groups or health literacy groups for either White or Black beneficiaries, suggesting that healthcare providers did provide equitable care, treating Medicare beneficiaries equally with no significant variation among disadvantaged populations.

We propose standardizing health outcomes for each racial group by age for a fair and unbiased assessment of health disparities. The rate of PSEs increases with age across all racial groups. However, disparity exists in median life expectancy between races, and when we standardized age in this analysis, it revealed that this underlying life expectancy disparity masked an actual disparity in rate of PSEs between Black and White beneficiaries.

References

1. BFCC NCORC. (2023). Annual preventability report: A review for preventable patient safety events.
2. Bates, D. W., et al. (2023). The safety of inpatient health care. The New England Journal of Medicine, 388(2), 142–153. <https://doi.org/10.1056/nejmsa2206117>.
3. CMS. (2019, October). Design and development of the Diagnosis Related Group (DRGs). ICD-CM/PCS MS-DRG v37.0 Definitions Manual. [https://www.cms.gov/icd10m/version37-fullcode-cms/fullcode_cms/Design_and_development_of_the_Diagnosis_Related_Group_\(DRGs\).pdf](https://www.cms.gov/icd10m/version37-fullcode-cms/fullcode_cms/Design_and_development_of_the_Diagnosis_Related_Group_(DRGs).pdf).
4. CMS. (2016). DRG relative weights. [https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/Acute InpatientPPS/Acute-Inpatient-Files-for-Download-Items/CMS022597](https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/Acute%20InpatientPPS/Acute-Inpatient-Files-for-Download-Items/CMS022597).
5. National Health Literacy Mapping to Inform Health Care Policy. (2014). Health Literacy Data Map. University of North Carolina at Chapel Hill. <http://healthliteracymap.unc.edu/>. Work performed by Principal Investigators Bailey/Fang under grant number 1R01AG046267-01A1.
6. Kind, A., & Buckingham, W. R. (2018). Making neighborhood-disadvantage metrics accessible — the neighborhood atlas. The New England Journal of Medicine, 378(26), 2456–2458. <https://doi.org/10.1056/nejmp1802313>.
7. Arias, E., Tejada-Vera, B., Kochanek, K. D., & Ahmad, F. (2022). Provisional life expectancy estimates for 2021. Vital Statistics Rapid Release, 23. <https://doi.org/10.15620/cdc:118999>.