

RESEARCH LETTER

# Disparities in Anticoagulation Use by Race and Ethnicity in Long-Term Care Residents With Atrial Fibrillation

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**A**trial fibrillation (AF) is prevalent in long-term care (LTC) facilities. Real-world data demonstrate that Black patients with AF are 10% to 22% less likely to be on anticoagulation compared with White patients in the ambulatory setting.<sup>1</sup> It is unclear if this disparity is present in the LTC setting as well.

LTC care is highly segregated. Compared with White residents, racial and ethnic minority residents receive care in facilities with more limited financial resources and quality deficiencies.<sup>2</sup> No one has previously examined the role of facility, particularly the percentage of racial and ethnic minority residents at a given facility, and its relationship with anticoagulation use in residents with elevated risks for stroke and AF.

Considering theory-based structural racism,<sup>3</sup> we measured the association of resident race and ethnicity combined with facility percentage of racial and ethnic minority residents on the use of anticoagulation in US LTC facilities.

Although we are not allowed to share our data, a technical appendix of our statistical procedure can be made available by the corresponding author upon request.

We included residents with AF and CHA<sub>2</sub>DS<sub>2</sub>-VASc scores  $\geq 2$  living in the LTC setting (ie, >100 days in a nursing home) between July and December 2015 and continuously enrolled in Medicare Part D for 7 months up to and including their index assessment. Residents

were considered to have AF if they had a record of cardiac dysrhythmia recorded in the minimum data set (MDS) or an *International Classification of Diseases, Tenth Revision (ICD-10)* diagnosis code consistent with AF following a prior example in the literature.<sup>4</sup> We excluded residents on hospice. The University of Massachusetts Institutional Review Board approved our analysis as exempt from federal regulatory review given its deidentified nature.

We tracked anticoagulation using Medicare Part D data. Specifically, we considered a patient on anticoagulation if the fill date for an anticoagulation medication record plus days supplied in this record overlapped with the index assessment accounting for medication accumulation and recent hospitalization.

We identified race and ethnicity with the Research Triangle Institute–Race Code variable within the Medicare Beneficiary Survey File. The variable includes categories non-Hispanic White race (hereafter referred to as simply “White” race), Black race, Hispanic ethnicity, American Indian/Alaska Native race, Asian race, or Other race (ie, not specified by other Medicare race or ethnicity category). The Research Triangle Institute–Race Code variable improves ascertainment of Hispanic ethnicity through surname-based imputation. We then calculated the percentage of racial and ethnic minority residents in each facility and grouped each facility into 4 categories (roughly quartiles) based on the

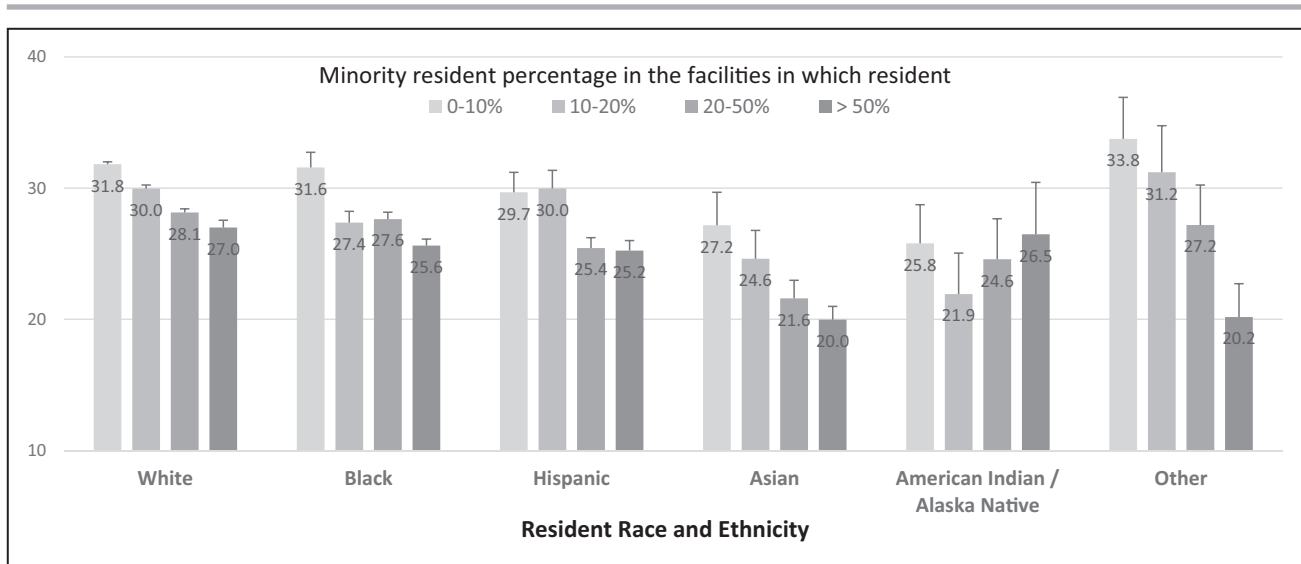
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**Figure.** Percentage of anticoagulation use in race and ethnicity-facility minority percentage composite groups.

Values above each bar represent the percentage of anticoagulation use in resident race and ethnicity-facility minority percentage composite groups adjusted for resident and facility characteristics as well as clustering by facility. The type III chi-square for the composite race-minority facility percentage variable was 320.46 with 23 degrees of freedom corresponding to a  $P < 0.0001$ .

percentages 0% to 10%, 10% to 20%, 20% to 50%, >50%. Finally, we assigned each patient into race-facility minority percentage composite categories.

We examined multiple resident characteristics available in the MDS to adjust for potential confounding. This included several geriatric conditions including fall history, dependency in activities of daily living, mobility impairment, cognitive impairment, low body mass index, and weight loss. We also adjusted for stroke risk (ie, CHA<sub>2</sub>DS<sub>2</sub>-VASc score) and bleeding risk factors (cirrhosis, anemia, renal disease, use of antiplatelet medication).

We also examined for-profit status (for-profit versus not-for-profit), chain status (versus independent facility), staffing ratios (registered nurses and licensed practical nurses to patients), percentage of Medicaid residents, and Centers for Medicare and Medicaid (CMS) 5-star quality rating.

We constructed a binomial logistic regression model with a generalized estimating equation to measure percentage of anticoagulation use in patient race and ethnicity-facility minority percentage groups adjusted for resident and facility characteristics as well as clustering by facility.

We identified 199 822 eligible residents living in 6183 LTC facilities. Of these, 60 065 residents (29.8%) were on anticoagulation. The mean age of the residents was 83.1±9.7 years. Most residents were of White race (81.8%). White residents had the highest anticoagulation use (30.5%), followed by Black residents (27.1%), Hispanic residents (26.3%), and Asian residents (21.6%). When examining the resident race and ethnicity-facility minority percentage composite groupings, we found that the anticoagulation rates

were higher in facilities with a lower percentage of racial and ethnic minority residents (0%–10%) and lower in facilities with a higher percentage of racial and ethnic minority residents (>50%). This was consistent across resident racial and ethnic categories (apart from American Indian for which we had small numbers,  $n=731$ ; see the Figure).

Anticoagulation usage was low across the board (28.7%) with significantly lower anticoagulation use by resident race and ethnicity. Facilities with higher percentages of racial and ethnic minority residents living within them had lower anticoagulation use for nearly every racial and ethnic category.

Our findings resemble those reported almost 20 years ago by Christian et al.<sup>5</sup> They found that racial and ethnic minority residents were ≥20% less likely to receive anticoagulation compared with White residents in cases in which there was an indication for anticoagulation. We extended the prior work by analyzing facility characteristics including the percentage of racial and ethnic minority residents. Despite nursing home quality improvement efforts, including CMS quality reporting, care delivery remains inequitable for racial and ethnic minority residents in terms of anticoagulation prescription.

We identified a racial disparity in anticoagulation use even after adjusting for an extensive list of resident and facility characteristics (including quality rating and staffing ratios). Limitations to our findings include that trends may also have changed since 2015. It is also unclear what the target anticoagulation rates should be in this population given many patients are nearing end of life. Absence of information on reason for nonuse

of anticoagulation and cardiology consultation are also limitations. Better education of residents and increasing cardiology referrals represent potential remedies.

## ARTICLE INFORMATION

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## REFERENCES

1. Essien UR, Holmes DN, Jackson LR II, Fonarow GC, Mahaffey KW, Reiffel JA, Steinberg BA, Allen LA, Chan PS, Freeman JV, et al. Association of Race/Ethnicity with oral anticoagulant use in patients with atrial fibrillation: findings from the outcomes registry for better informed treatment of atrial fibrillation II. *JAMA Cardiol*. 2018;3:1174–1182. doi: 10.1001/jamacardio.2018.3945
2. Mor V, Zinn J, Angelelli J, Teno JM, Miller SC. Driven to tiers: socioeconomic and racial disparities in the quality of nursing home care. *Milbank Q*. 2004;82:227–256. doi: 10.1111/j.0887-378X.2004.00309.x
3. Churchwell K, Elkind MSV, Benjamin RM, Carson AP, Chang EK, Lawrence W, Mills A, Odom TM, Rodriguez CJ, Rodriguez F, et al. Call to action: structural racism as a fundamental driver of health disparities: a presidential advisory from the American Heart Association. *Circulation*. 2020;142:e454–e468. doi: 10.1161/CIR.0000000000000936
4. Alcusky M, McManus DD, Hume AL, Fisher M, Tjia J, Lapane KL. Changes in anticoagulant utilization among United States nursing home residents with atrial fibrillation from 2011 to 2016. *J Am Heart Assoc*. 2019;8:e012023. doi: 10.1161/JAHA.119.012023
5. Christian JB, Lapane KL, Toppa RS. Racial disparities in receipt of secondary stroke prevention agents among US nursing home residents. *Stroke*. 2003;34:2693–2697. doi: 10.1161/01.STR.0000096993.90248.27