

Using Nursing Home Electronic Medical Records for Behavior Identification: Differential Findings by Resident Race and Ethnicity

Authors: Hyunkyung (Yulia) Yun, MS, MSW¹, Vincent Mor, PhD¹, Ellen McCreedy, PhD, MPH¹
¹ Department of Health Services, Policy, & Practice, Brown School of Public Health



BACKGROUND

- Agitated behaviors are under-reported in the Minimum Data Set (MDS), a standardized assessment of nursing home (NH) residents, which poses challenges for pragmatic trialists hoping to use routinely collected data to assess study eligibility and outcomes.
- Our recent study found that using **Interventions to Reduce Acute Care Transfers (eINTERACT)** and **Physician Orders** from electronic medical records (EMR) increases behavior identification over the MDS alone by 25.7% relative increase (14.8% (SD 35.6) by MDS only vs. 18.6% (SD 38.9) by supplemented by EMR) among NH long-stay residents with Alzheimer's Disease and Related Dementia (ADRD).
- Variations in behavioral capture by race and ethnicity need to be explored.

OBJECTIVE

- To understand if there were racial or ethnic inequities in which NHs were using and not using the EMR (any records in eINTERACT forms).
- To examine racial or ethnic disparities in behavior identification by the EMR sources, among NHs regularly using the EMR.

METHODS

DATA AND PARTICIPANTS:

- The MDS and the EMR data from the NHs operated by Genesis Healthcare, between January 2020 and August 2022.
- 19,705 long-stay NH residents with ADRD in 322 NHs.

METHODS:

- Compared the individual- and NH characteristics between the total sample and the subsample from NHs regularly using the EMR.
- Compared the behavior identification by EMR data across race and ethnicity
 - Unadjusted comparison in the distributions of the key indicators and EMR-identified behaviors.
 - Adjusted comparison of the EMR-identified behaviors. Adjusted for clinical indicators, medications, time-variant NH characteristics with NH and year-month fixed effects.

RESULTS

Table 1. Characteristics of NHs using eINTERACT regularly

	Total Sample (19,705 residents in 312 NHs)	NHs using eINTERACT regularly (5,192 residents in 81 NHs)	P-value
Resident characteristics			
Race/Ethnicity, %(N)			
White	78.17 (15,404)	80.51 (4,180)	<0.001
Black or African American	10.45 (2,060)	11.19 (581)	0.125
Hispanic or Latinx	5.96 (1,175)	3.54 (184)	<0.001
Asian	1.55 (305)	1.02 (53)	0.005
American Indian or Alaska Native	1.42 (279)	1.64 (85)	0.237
Native Hawaiian or Other Pacific Islander	0.10 (20)	0.08 (4)	0.613

Note: The characteristics were taken from the latest MDS records of the individuals during the study period. NHs using eINTERACT regularly were defined as the top quartile NHs based on the percent of residents in the NH with eINTERACT form.

Table 2. Distribution of Key Indicators and EMR-Behaviors by Race/Ethnicity Among NHs using EMR regularly

(person-month)	Total (22,475)	White (17,924)	Black/African American (2,670)	Hispanic/ Latinx (861)	Asian (199)	American Indian/ Alaska Native (436)
Key Factors						
Cognitive Impairment, %(N)						
Moderate/Severe (3+4)	61.3 (13,539)	60.0 (10,762)	63.1 (1,684)	70.6 (608)	77.4 (154)	74.1 (323)
Medications, %(N)						
Antipsychotic use	24.7 (5,458)	26.2 (4,690)	16.4 (438)	29.6 (255)	18.1 (36)	7.8 (34)
Behavior by Sources						
Behavior Detection, %(N)						
MDS	15.3 (3,381)	16.5 (2,958)	9.7 (258)	13.1 (113)	9.5 (19)	6.2 (27)
eINTERACT	3.4 (756)	3.7 (660)	1.9 (52)	3.0 (26)	3.0 (6)	2.5 (11)
Orders	3.8 (841)	3.9 (700)	2.6 (70)	5.3 (46)	2.5 (5)	4.6 (20)
Gains over MDS, %points						
With eINTERACT	2.0	2.2	1.2	2.3	1.1	1.6
With eINTERACT + Order	7.2	7.4	5.6	8.6	4.1	7.8

Table 3. Adjusted Relationship Between EMR Behavior Capture and Race/Ethnicity Among NHs using EMR regularly

	Behaviors captured by eINTERACT		Behavior captured by Orders	
	Coefficient (SE)	P-value	Coefficient (SE)	P-value
Black (Ref. White)	0.011 (0.008)	0.186	0.007 (0.017)	0.673
Hispanic or Latinx	0.045 (0.029)	0.125	0.048 (0.033)	0.150
Asian	-0.007 (0.009)	0.431	0.010 (0.012)	0.402
American Indian or Alaska Native	-0.011 (0.010)	0.293	-0.036 (0.007)	0.000
Native Hawaiian or Other Pacific Islander	0.003 (0.008)	0.677	-0.029 (0.012)	0.017
Missing	0.014 (0.017)	0.412	0.040 (0.021)	0.057

SUMMARY OF RESULTS

- Black residents were slightly more likely, and Latinx and Asian residents were slightly less likely to be in NHs regularly using eINTERACT, although they did not differ much between the two groups (**Table 1**).
 - Considering only NHs regularly using eINTERACT may bias results for Latinx and Asian residents.
- Black residents were less likely to have behaviors documented in both MDS and EMR despite the higher share of moderate/severe cognitive impairment and less antipsychotic use (**Table 2**).
- Racial disparities looked flattened in the adjusted comparison (**Table 3**).
 - However, the key indicators were significant predictors of the EMR-behavior detection for White residents only.
 - Further exploration is needed to understand what the **drivers of these differential findings** are.
- It is also important to assess how much the current answers for research questions to understand the agitated behaviors and other aspects of residents are biased; and what alternative answers could be found instead.

LIMITATIONS & STRENGTHS

- Followed the MDS race and ethnicity categorization.
- Replication of the analysis is needed for the transportability of the findings
- Study period overlaps with the COVID-19 pandemic

CONCLUSIONS

- Supplementing the MDS with EMR increased the capture of agitated behaviors, however, the gains achieved by these EMR sources in behavior detection do not look consistent across race and ethnicity.
- This has implications for inclusion in pragmatic trials and receipt of possibly advantageous treatments.