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Prevalence of Incontinence by Race and Ethnicity of Older People Admitted to Nursing Homes

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There has been a recent, historic shift in utilization of nursing homes (NHs). For the first time ever in the United States (US), the proportion of older (≥ 65 years) Black individuals residing in NHs (51/1000) is greater than the proportion of older Whites in NHs (42/1000).^{1, 2} For the years 1999–2008, the number of Hispanics residing in NHs rose 54.9%, the number of Asians grew 54.1%, and the number of Blacks grew 10.8%; the increase in minority group NH utilization out-paced the growth of minority groups in the general population.¹

Incontinence is a major reason older people are admitted to a NH.^{3–5} A high prevalence of incontinence (urinary (UI), fecal (FI), or dual (urinary and fecal incontinence, DI)) (43–79%) has been documented for the NH population at-large (long-stay residents together with new admissions) with higher rates of UI in female than male residents.^{6–9} However, little is known about incontinence in older individuals who are newly admitted to NHs or according to their race and ethnicity. In the one study conducted in NHs, which were located in the Southeast US,¹⁰ researchers found that the prevalence of UI at admission was 7% higher among Blacks than Whites. Another report found that Black NH residents were more likely to have any type of incontinence (UI, FI, or DI) all of the time compared to residents of all other races combined (70% vs. 63%).¹¹ Additionally, racial/ethnic differences in the prevalence of incontinence have been reported in community-living residents,^{12, 13} approximately 46% of which are projected to seek NH care. Regional differences have been reported in functional status,¹⁴ disability,¹⁵ and health problems such as diabetes,¹⁶ which may be risk factors for incontinence in the elderly, but it is unknown whether incontinence prevalence at NH admission varies by region. Social science research uses the term ‘individualistic fallacy’ when complex conditions in populations, such as health disparity or incontinence in NH admissions, are presumed to be due solely to individual-level

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characteristics.¹⁷ Ignoring group-level or community-level information may lead to an incomplete understanding of a condition so there is value in multi-level investigations.^{18–20}

Increasing awareness of sources of health disparities is among the Institute of Medicine's recommendations to improve equity and quality of healthcare.²¹ Reducing racial/ethnic disparities is believed to offer the most feasible opportunity for improving the health of Americans.²² Awareness of health disparities among newly admitted residents is important as admission is a critical time for identifying and managing health problems and organizing resources to increase the likelihood that residents will return to the community or to prevent further health decline. Given reports of a concentration of minorities in NHs with low levels of resources and care quality,^{1, 23} racial/ethnic disparities in incontinence among admissions may further disadvantage these NHs.

The purpose of this paper was to describe the prevalence of incontinence in older adults admitted to a national for-profit NH chain by race/ethnicity. Prevalence outcomes for UI, FI, and DI are reported at three levels: by individual admissions, NHs, and US Census divisions. Incontinence prevalence of individual admissions is also reported by gender. This study uses data of a for-profit chain of NHs. For-profit NHs currently house over 68% of all US NH residents.²⁴

METHODS

Design and Datasets

This is a cross-sectional descriptive study of new admissions 65 years of age to 457 NHs over a three-year period (2000–2002). The NHs, located in 31 states, were affiliated with/owned by the same for-profit nursing facility chain, and all were Medicare and Medicaid certified. Data were de-identified, and the study was granted exempt status by the Institutional Review Board of the author's university. Two datasets were used, the MDS version 2.0 (years 200–2002) and the 2000 US Census. MDS records provided demographic, clinical, and functional data for each NH resident. The psychometric properties of the MDS instrument including incontinence items have been established.^{25, 26} Using US Census data, the census tract of each NH in the dataset was determined by the Population Center at the author's university using the address of the NH and a unique facility identification number. Tract level data were aggregated into their corresponding Census divisions.²⁷

Variable Definitions and Cohort Description

Six incontinence variables were coded for each resident using items from their admission MDS of which three definitions were non-overlapping: Only UI, Only FI, and DI. Three overlapping incontinence variables were defined according to outcomes commonly reported in the literature: Any incontinence (UI and/or FI and/or DI), Any UI (UI with or without FI), and Any FI (FI with or without UI). All incontinence definitions included MDS assessments of frequently incontinent, usually incontinent, and incontinent and excluded MDS assessments of being continent or usually continent.

Race and ethnicity at the individual level were coded according to MDS definitions: American Indian/Alaskan Native, Asian/Pacific Islanders, Black not of Hispanic origin, Hispanic, and White not of Hispanic origin. At the NH and regional levels, this variable was aggregated as the percentage of White individuals in the admission cohort of each NH and in the census division of the NHs. The categories of percentages of White admissions to NHs have been adopted by others:²⁸ < 65% White, 65–84%, 85–94%, and 95% White.

The admission cohort was selected on the basis of the first admission MDS assessment. Subsequent readmission records were excluded. The cohort of NH admissions was described

using standard demographic variables available on the MDS: age, gender, and education. Functional and clinical status was described using individual MDS items and established MDS-based scales as the MDS contains more than one item that might define a relevant variable. Where no scale existed or single MDS items were insufficient, composite measures were developed using previously established statistical procedures and consultation from clinical and research experts.²⁹ All scales and composite variables were coded so that a higher score indicated a worse status. The comparability of the admission cohort of the for-profit NHs with the population of admissions 65 years old to all Medicare/Medicaid certified NHs in the US during the same time period (2000–2002) was assessed. Summary statistics of the incontinence variables and common demographic and functional status variables of both cohorts were examined. Sociodemographic and socioeconomic characteristics of the communities surrounding the NHs of the admission cohort were described using Census data.

Analysis

Data were summarized using descriptive statistics. Differences among residents' racial and ethnic groups, NH categories, and census tracts were not formally tested for significance as the very large sample size renders even the smallest differences as statistically significant. Thus no formal statistical assessment of differences was performed and no p-values were generated.

RESULTS

Cohort Characteristics

There were 111,640 admissions to the for-profit NHs, and their mean age was 82 years; the majority was female and had a high school education (Table 1). All MDS categories of race/ethnicity were represented. Almost half of all admissions had some type of incontinence. The prevalence of DI was highest and Only FI was lowest. The admission cohort of the for-profit NHs was very similar to that of US NHs on the characteristics compared (Table 1).

Characteristics of the racial/ethnic groups of our sample show that fewer Blacks, Hispanics, and American Indians had a high school education than Whites and Asians (Table 2). Most of the oldest admissions were Asian. Blacks, Hispanics, and Asians were more debilitated than Whites in terms of function, mobility, and cognition. For example, compared to Whites, these minority admissions had more deficits in activities of daily living, comorbidities, and vision impairments; a higher percentage suffered from paralysis/weakness and received tube-feeding. A higher percentage of Blacks, Hispanics, and American Indians were bedfast or required a mechanical lift compared to Whites and Asians. More Whites and Asians had perfusion problems, and they had the highest mortality risk. Cognitive function was worse for Blacks, Hispanics, and Asians. A greater percentage of White and American Indians showed depression symptoms and discomfort behaviors compared to other racial/ethnic groups.

The racial and ethnic composition of the communities surrounding the for-profit NHs resembles the NH admissions (Table 3). Half of the NHs were in locations in which 75% or more of the community lived in an urban area. Socioeconomic factors show that most of the NHs were in communities with working and middle class populations.

Prevalence of Incontinence by Race and Ethnicity

Individual Level—The prevalence of Any Incontinence in White admissions was 48%, while Asians, Blacks, and Hispanics had higher rates (Table 4). Among the non-overlapping definitions of incontinence, DI had the highest prevalence among all racial/ethnic groups

and was predominant in Blacks and Asians. The prevalence of Only UI and Only FI was the same in Whites and Asians. The prevalence of Only UI was 3% higher than Only FI in Whites and Asians but in Blacks and Hispanics the reverse was seen--the prevalence of Only FI was 4–6% higher.

Among Asians and Whites, there was a higher prevalence of all types of incontinence in men compared to women except for Only UI (Table 4). In Blacks, an opposite trend was seen. The prevalence of Any Incontinence, Any UI, and DI was 2–3% higher in women than men; however, the higher prevalence in DI among Black women may be responsible for these differences as the definitions overlap. In American Indians, the largest gender-based difference was in the prevalence of Only FI which was 3% higher in men. The largest difference between men and women in incontinence prevalence was in Asians (7–10%) followed by Whites (4–5%).

Nursing Home Level—Approximately half of all admissions lived in NHs with 95% White admissions (Table 5). The prevalence of incontinence and the percentage of Whites at NH admission trend in the same direction for all outcomes except Only UI: NHs with the lowest percentage of White admissions had the highest prevalence of incontinence among their admissions. The difference in prevalence between NHs with the highest and lowest percentages of White admissions was greater than 20% for Any FI and DI.

Regional Census Division Level—The nine Census Divisions included a range of 3 to 116 of the NHs in this sample (Table 6). The average percentage of Whites admitted to these NHs ranged from 97% (West North Central Divisions and New England Divisions) to 74% (Mountain Division). The strongest association between the prevalence of incontinence and the percentage of White NH admissions is seen in the West North Central Divisions and New England. The prevalence of all types of incontinence except for Only UI was lowest in those two Divisions with the most White admissions. Results across other Census Divisions are inconsistent. For example, in both the Middle Atlantic and South Atlantic Divisions, 56% of admissions have some kind of incontinence, but the percentage of White admissions is 95% in the former and 78% in the latter.

DISCUSSION

The results extend knowledge about racial and ethnic differences in the prevalence of incontinence in newly admitted residents in US NHs by analyzing data for all minority groups and according to the various incontinence definitions commonly reported. Our findings agree with others¹⁰ that the prevalence of incontinence was higher among Black NH admissions than Whites, and we have shown the consistency of this result regardless of the type or definition of incontinence used. Our findings provide new information that the prevalence of different types/definitions of incontinence among Hispanic and Asian admissions was also consistently higher than Whites with the exception that the rate of Only UI in Hispanics was equal to Whites.

The 52% prevalence of Any UI among Black admissions in our study is lower than the 71% reported by Boyington et al.¹⁰ Data from our analysis at the regional level offer insight into the difference. The prevalence of Any UI in NHs in the South Atlantic Census division, where 60% of the residents in the study by Boyington et al.¹⁰ were located, was among the highest in the country. Further, NHs in the South Atlantic Census Division had the second lowest percentage of White admissions and the highest prevalence of Any UI incontinence in the nation. Therefore, the slightly higher rate of Any UI reported by Boyington et al.¹⁰ may be due in part to regional influences.

Our findings are among the first to report gender-based outcomes of incontinence in NH admissions in all the racial/ethnic MDS groups. Incontinence was more common in men who were White and Asian. The finding of a greater prevalence of Any Incontinence and DI in Black women agrees with the results of Martin et al.³⁰ who reported greater dependence in urination and defecation among Black females compared to males newly admitted to eight Southern US NHs. There was a slightly greater difference (3%) in the prevalence of Any UI between Black male and female NH admissions in our study compared to the 1% difference found by Boyington et al.¹⁰ in the southeastern states except Mississippi where the difference was also 3%.

The results of this study add new information about the prevalence of incontinence at the NH and Census tract levels. The prevalence of five of the six types/definitions of incontinence among admissions was lowest in the two Census Divisions with the highest percentage of White admissions (West North Central Divisions and New England Divisions). Others have reported that Black and Hispanic individuals are more likely to be admitted to NHs with poorer quality of care, fewer nursing staff, and limited financial resources.^{1, 23, 31} Our results indicate that among the challenges faced by NHs that admit higher percentages of older minority adults is the need to manage more incontinence, which may necessitate additional nursing staff resources. Schnelle et al.³² estimated that one nurse aide for every five NH residents on an 8-hour day shift would be necessary to conduct an integrated exercise-prompted toileting intervention that reduced incontinence frequency, surpassing staffing standards and the common ratio of one aide per 10 residents on the day shift. An overall estimate of the annualized cost of care for UI in NH admissions in 2000 was \$6 billion.⁵ Results of our study highlight the need for resources to assess and manage incontinence from the time of admission. A potential repercussion of a perceived high care burden/cost for certain groups could be discrimination in admitting practices.

Our results suggest that using non-overlapping definitions of incontinence provides a clearer understanding of differences in the types of incontinence among racial/ethnic groups of NH residents. For example, they reveal a high prevalence of DI, which has not been a focus of most previous NH studies. Distinguishing among UI, FI, and DI may provide important information for managing incontinence after NH admission. Schnelle et al.³³ subsequently reported that an intervention integrating prompted toileting and exercise which decreased UI frequency had no significant effect on the frequency of FI in NH residents. Further research is needed to examine the types of interventions best suited for reducing UI versus FI or DI as well as for managing incontinence present at admission versus preventing the development of new incontinence post admission.

There are limitations to this study. This observational study is preliminary to multivariate analyses which are needed to understand the etiology underlying differences in incontinence among racial/ethnic groups of NH admissions. Nonetheless, the observations of this study lend support to the importance of considering factors at multiple levels¹⁷ when assessing potential disparities in complex health conditions, such as incontinence, among NH admissions. Differences in the prevalence of incontinence that transcend the individual resident level support growing evidence^{1, 23, 31, 34} that sociodemographic and socioeconomic factors of regions and local NH communities cannot be ignored when analyzing differences in NH care needs among subgroups of elderly. Another limitation of this study was the use of a convenience sample of admissions from a for-profit chain of NHs that may not be representative of all US NHs or admissions. However, there is remarkable similarity between the characteristics and prevalence of the different incontinence outcomes of the study sample and US NH admissions. Findings may be limited by use of the MDS to obtain information on the incontinence outcomes as variations in data collection methods

across NHs could potentially affect prevalence estimates. Recent changes in health policy and healthcare prior to NH admission may limit the generalizability of the results.

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Table 1

Comparison of Characteristics of Older Individuals Admitted to all US and a National Chain of For-Profit Nursing Homes in 2000–2002

Admissions	US Nursing Homes n = 2,664,649	For-Profit Nursing Homes n = 111,640
% of residents		
Only Urinary Incontinence	14	11
Only Fecal Incontinence	8	9
Dual Incontinence	26	29
Any incontinence	48	49
Any Urinary Incontinence	40	40
Any Fecal Incontinence	35	38
Females	68	65
American Indian/Alaskan Native	0.36	0.50
Asian/ Pacific Islander	1	2
Black, not Hispanic	9	9
Hispanics	3	2
White, Not Hispanic	87	87
High School education	63	59
Pressure Ulcer (Stage 2, 3 or 4)	15	14
Stage 3 or 4 Pressure Ulcer	6	6
Restraint Use	5	4
mean (sd)		
Age	82.5 (7.6)	81.8 (7.6)
Activity of daily living status ³⁵	15.4 (7.2)	15.5 (7.8)
Cognitive status ³⁶	3.3 (3.0)	3.8 (1.7)

Table 2
Demographic, Clinical, and Functional Characteristics of Older Nursing Home Admissions by Race and Ethnicity

Variable Scale	MDS Item	American Indian/ Alaskan Native	Asian/ Pacific Islander	Black	Hispanic	White
Admissions		n = 558	n = 1,944	n = 9,580	n = 1,956	n = 97,594
Demographics						
Age 65–74 Years	AA3	37	15	29	30	19
Age 75–84 Years	AA3	38	45	41	41	44
Age 85 Years	AA3	25	41	30	29	37
Gender - Females	AA2	58	60	62	57	66
High School Education	AB7	38	54	36	34	66
Function/Mobility						
Activities of Daily Living ^{35*}	G1a-bA, G1eA, G1g-jA, Range 0 – 28	14.3 (8.6)	18.5 (6.3)	17.7 (8.3)	16.8 (8.0)	15.0 (7.7)
Plegias or Pareses - Any	Ilv, Ilx, Ilz	6	20	11	11	6
Restraints-Any Use	P4c-e	4	8	5	6	4
Side Rails-Any Use	P4a-b	50	81	73	77	65
Transfer Dependence - Any	G6a, G6d	20	13	25	20	13
Vision Impairment	D1, D2a, D2b					
<i>Number of Indicators</i>						
1		23	26	27	23	22
2		11	12	11	10	8
3		10	8	13	10	6
Cognition/Emotion						
Cognition <i>MDS-COGS</i> ^{6*}	B2a-b, B3b, B3d-e, B4, C4, G1gA, range 0 – 10	3.2 (3.0)	3.8 (2.7)	4.3 (3.1)	3.7 (3.2)	3.1 (3.0)
Communication Difficulty <i>adapted from Hopper et al.</i> ^{37*}	C1, C5, C6, C3b-f range 0 – 9	1.5 (1.7)	2.2 (1.9)	1.6 (1.8)	1.6 (1.8)	1.3 (1.6)

Variable Scale	MDS Item	American/ Indian/ Alaskan Native	Asian/ Pacific Islander	Black	Hispanic	White
Admissions		n = 558	n = 1,944	n = 9,580	n = 1,956	n = 97,594
Demographics						
Delirium <i>MDS-CAM</i> ³⁸	B1, B5a-f, B6, E3, E5					
Subsyndromal delirium level 1		19	19	15	15	15
Subsyndromal delirium level 2		10	16	9	7	11
Full delirium		1	1	1	0	1
Depression						
Any indicator from <i>MDS Depression Scale</i> ³⁹	E1a, E1d, E1f, E1h, E1i, E1l-m	29	14	21	20	28
Discomfort Behavior Scale ^{40*}	E1c, E1k-p, E4a-e, E4a-eB, range 0 – 102	5.1 (9.2)	3.3 (7.2)	3.8 (8.3)	3.8 (8.0)	4.2 (8.6)
MDS Mood Scale ^{41*}	E1a, E1c, E1e-h, E1m-n, E2, K4c, range 0 – 8	1.0 (1.4)	0.95 (1.1)	0.77 (1.1)	0.83 (1.2)	1.1 (1.4)
Physical 25.3 (5.1)						
Body Mass Index*	K2a, K2b	25.3 (5.1)	22.7 (3.7)	25.4 (5.4)	25.5 (4.9)	25.3 (5.1)
Catheter - Indwelling	H3d	17	17	20	21	18
Catheter - Intermittent	H3e	1	3	0	1	1
Comorbidities <i>Charlson Index</i> ^{42*}	I3a-e and/or II, range 0 – 30	2.2 (1.7)	2.3 (1.8)	2.4 (1.7)	2.4 (1.8)	1.8 (1.6)
Fever in Last 7 Days	J1h	5	7	4	3	4
Mortality risk <i>CHES Scale</i> ^{43*}	J1c, J1g, J1l, J1o, K3a, K4c, J5c, B6, G9, range 0 – 5	1.5 (1.2)	2.1 (1.0)	1.6 (1.1)	1.6 (1.1)	1.9 (1.1)
Medications <i>Number in last week</i> *	O4a-e, range 0 – 35	5.0 (5.5)	2.9 (4.3)	4.9 (5.5)	4.7 (5.5)	6.3 (6.0)
Oxygenation Impairment <i>Number of Indicators</i>	J1b, J1k-l, P1ag, P1i-j, P1al, P1bd					
1		11	11	10	12	13
2		10	5	6	8	9

Variable Scale	MDS Item	American Indian/ Alaskan Native n = 558	Asian/ Pacific Islander n = 1,944	Black n = 9,580	Hispanic n = 1,956	White n = 97,594
Admissions						
Demographics						
3		5	5	5	5	7
Pads/Briefs-Any use	H3g	50	66	65	56	49
Perfusion Impairment Number of Indicators	J1a, J1c-d, J1g					
1		21	30	26	23	29
2		1	4	2	2	2
Poor Nutrition Number of Indicators	K3a, K4c					
1		35	45	38	38	44
2		9	11	6	7	9
Tube Feeding	K5b	7	15	14	12	5

Table 3

Characteristics of Nursing Homes and Their Surrounding Communities

Socio-demographic or socio-economic factor of NH communities	% of Nursing Homes *										Mean (sd) value
	% of American Indian/Asian in area around NH	% of Black non-Hispanics in area around NH	% of Hispanic in area around NH	% of White non-Hispanic in area around NH	% of community with high school diploma or equivalent	% of population inside an urban area around NH	% of population in rural area around NH	%s below poverty in area around NH	% of Working class in area around NH		
< 25%	97	87	91	4	1	47	77	91	0.5		
25 to < 50%	2.5	8	6	9	32	0.2	8	8.5	10		
50 to < 75%	0	4	2	17	66	2.8	2	0.5	74.5		
75%	0.5	1	1	70	1	50	13	0	15		
Median household income										\$39,116 (\$15,402)	

NH, nursing home

* NH level data were available for 446 NHs

Table 4

Individual Level: Prevalence of Incontinence Among Nursing Home Admissions by Race/Ethnicity

	American Indian/ Alaska Native			Asian/ Pacific Islander			Black, Not Hispanic			Hispanic			White, Not Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Number of Admissions		236	322		776	1,168		3,618	5,962		848	1,108		33,261	64,332
% of Admissions															
Only UI	9	9	10	12	10	13	8	8	8	9	9	9	12	11	12
Only FI	10	12	9	9	10	7	14	15	14	13	14	12	9	11	8
DI	27	26	27	46	50	43	44	43	45	36	37	36	27	28	26
Any Incontinence	46	46	46	67	70	63	66	65	67	58	60	57	48	50	46
Any UI	36	35	37	57	60	56	52	50	53	45	45	45	38	39	38
Any FI	37	38	36	54	60	50	58	58	58	49	51	48	36	39	34

UI, urinary incontinence; FI, fecal incontinence; DI, dual incontinence

Table 5

Nursing Home Level: Prevalence of Incontinence in Nursing Homes Classified by Percentages of White Admissions

Admissions	< 65% White n = 11,865	65–84% White n = 16,526	85–94% White n = 27,994	95% White n = 55,255
% of Admissions				
Only Urinary Incontinence	9	9	10	13
Only Fecal Incontinence	12	11	10	8
Dual Incontinence	42	37	33	21
Any Incontinence	62	57	53	43
Any Urinary Incontinence	51	46	43	35
Any Fecal Incontinence	54	48	43	29

Table 6

Regional Level: Incontinence Prevalence in US Census Divisions of NHs Ordered by Increasing Percent of White NH Admissions

Census Division	Mountain	South Atlantic	East South Central	Pacific	West South Central	East North Central	Middle Atlantic	New England	West North Central
US States in Census Division	MT, ID, WY, UT, CO, AZ, NV, NM	MD, DE, DC, WV, VA, NC, SC, GA, FL	KY, TN, MS, AL	WA, OR, CA, AK, HI	OK, AR, TX, LA	WI, MI, IL, IN, OH	NY, PA, NJ	ME, VT, NH, MA, CT, RI	ND, SD, MN, NE, IA, KS, MO
Number of NHs	3	54	55	70	34	62	43	20	116
Number of NH Admissions	1,239	15,270	15,685	23,689	5,408	14,585	10,354	4,322	21,088
% of NH Admissions that are White	74	78	81	84	85	92	95	97	97
Only Urinary Incontinence	8	7	9	10	10	13	14	11	15
Only Fecal Incontinence	9	10	11	12	10	9	11	8	6
Dual Incontinence	30	39	34	35	30	21	31	26	15
Any Incontinence	47	56	54	56	50	43	56	44	36
Any Urinary Incontinence	38	46	43	45	40	35	46	36	30
Any Fecal Incontinence	39	49	45	47	40	30	42	33	21

NH, nursing home