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Racial Disparities in Primary Prevention of Incontinence among Older Adults at Nursing Home Admission

Donna Z. Bliss, PhD, RN^a, Olga V. Gurvich, MA^a, Lynn E. Eberly, PhD^c, Kay Savik, MS^a, Susan Harms, PhD, RPh^{a,b}, Jean F. Wyman, PhD, RN^a, Christine Mueller, PhD, RN^a, Beth Virnig, PhD^d, and Kjerstie Wiltzen, BA, BSN^a

^aUniversity of Minnesota School of Nursing, Minneapolis, MN

^bCollege of Pharmacy, Minneapolis, MN

^cDivision of Biostatistics, Minneapolis, MN

^dDivision of Health Services Research and Policy of School of Public Health, Minneapolis, MN

Abstract

Maintaining continence of nursing home (NH) residents promotes dignity and well-being and may reduce morbidity and healthcare treatment costs.

Aims—To determine the prevalence of older continent adults who received primary prevention of incontinence at NH admission, assess whether there were racial or ethnic disparities in incontinence prevention, and describe factors associated with any disparities.

Methods—The design was an observational cross-sectional study of a nation-wide cohort of older adults free of incontinence at NH admission (n=42,693). Four US datasets describing NH and NH resident characteristics, practitioner orders for NH treatment/care, and socioeconomic and sociodemographic status of the community surrounding the NHs were analyzed. Disparities were analyzed for four minority groups identified on the Minimum Data Set using the Peters-Belson method and covariates at multiple levels.

Results—Twelve percent of NH admissions received incontinence prevention. There was a significant disparity (2%) in incontinence prevention for Blacks (p<.05): Fewer Black admissions (8.6%) were observed to receive incontinence prevention than was expected had they been part of the White group (10.6%). The percentage of White admissions receiving incontinence prevention was 10.6%. Significant factors associated with disparity in receiving incontinence prevention were having greater deficits in ADL function and cognition and more comorbidities. No disparity disadvantaging the other minority groups was found.

Conclusions—Greater efforts for instituting incontinence prevention at the time of NH admission are needed. Eliminating racial disparities in incontinence prevention seems an attainable goal. Appropriate staff training, organizational commitment, and monitoring progress toward equitable outcomes can help achieve this goal.

Keywords

incontinence; disparities; race; nursing homes

Nearly half of older individuals who are admitted to nursing homes (NHs) do not have incontinence.^{1,2} However, NH residents have numerous risk factors for developing incontinence, notably limitations in physical and cognitive functions from aging and disease processes, medication side effects, and changes in their environment, diet and eating patterns, and sleep habits.²⁻⁴ Therefore, instituting interventions for primary prevention of incontinence is important to promote the health and well-being of NH residents and contain health care costs. Incontinence is associated with a broad array of adverse physical and emotional sequelae such as skin breakdown,⁵ increased hospitalization,⁶ and diminished quality of life.⁷ The incremental cost of NH care in US NHs attributable to managing urinary incontinence alone in 2006 has been estimated to be \$6 billion annually.⁸

Prevention of incontinence has been identified as a priority need by interdisciplinary experts,^{2,3} yet little is known about the prevalence of such efforts in NHs. Suggested strategies for preventing incontinence have been reviewed.^{3,4} For NH residents whose incontinence is often due to functional limitations, strategies include assisting with toileting, scheduled toileting, providing a urinal or commode, and promoting elimination patterns with adequate fluid and dietary fiber intake. Depending on the needs of the resident, these interventions are administered individually or as bundled protocols in NHs. General strategies at the NH and community level include effective management of comorbid conditions and insuring adequate resources and commitment to implement prevention interventions.^{2,9}

There is a history of disparities in the care of NH residents based on race/ethnicity, and the increases in the percentages of minorities in NHs could multiply existing inequities.^{10,11} Braveman¹² describes health disparity as worse health or greater risk of worse health in groups systematically disadvantaged or discriminated against due to factors such as race, ethnicity, poverty, sex, etc. Some disparities in NHs involve treatment of conditions that are associated with incontinence including lower rates of administration of medications for diabetes¹³ and stroke prevention in minority residents compared to Whites.¹⁴ Differences among NH and community/regional factors also contribute to health disparities.^{15,16} Elimination of health disparities is a priority of United States (US) health policy¹⁷ for which identification of disparities is a necessary first-step. The purposes of this study were to describe the prevalence of older continent adults who received primary prevention of incontinence at NH admission, assess whether there were racial or ethnic disparities in incontinence prevention, and identify predictors of any disparities. Potential predictors at multiple levels (individual resident, nursing home, and the community around the NH) were screened for inclusion in analyses.

Methods

Data Files

Data files of a national for-profit chain of NHs from years 2000–2002 were linked and analyzed. The data were 1) Minimum Dataset (MDS) v. 2.0 records which contain demographic and health assessment data of individual residents; 2) practitioner orders, which are written prescriptions by physicians or nurse practitioners for care treatments/interventions for a resident including medications, programs for toileting, activity, diet, procedures etc., and 3) Online Survey, Certification, and Reporting (OSCAR) records, which contain measures of NH staffing and deficiencies in quality of care. Additionally, US Census data from the year 2000 containing socioeconomic and sociodemographic measures of the Census tract of the community surrounding each NH were linked to the other files and analyzed. The Minnesota Population Center at the University of Minnesota, (Minneapolis, MN) identified the census tracts of the NHs. Data were coded and de-identified, and the study was considered exempt by the University of Minnesota Institutional Review Board.

Design and Cohort

This study had a cross-sectional design. The cohort included older adults (aged ≥ 65 years) who were continent upon their NH admission. Continence was defined as being continent or usually continent of urine and/or feces on their first full/admission MDS record. Residents with an indwelling urinary catheter or ostomy were excluded as it was not possible to distinguish between residents that had an indwelling catheter because of incontinence or another reason (e.g., urinary retention); similarly, continence status could not be determined in those with an ostomy. Race and ethnicity of the cohort were defined using MDS categories: American Indian or Alaskan Native (AIAN), Asian or Pacific Islander (API), Black non-Hispanic (Black), White non-Hispanic (White) and Hispanic. A previous study showed that the admission cohort of NH residents in the for-profit NHs in this study is highly comparable to older residents admitted to all Medicare/ Medicaid certified NHs in the US during the same time period.¹

Outcome of Incontinence Prevention

Incontinence prevention was defined using the admission MDS and practitioner orders (POs) within 24 hours of admission. A resident who was continent per the admission MDS record was determined to receive incontinence prevention if the same MDS record indicated they had a scheduled toileting program or bladder retraining program or there was an admission PO for an incontinence prevention intervention.

For searching POs, words and sets of words describing conditions of interest for our various analyses were generated from a review of the literature, consultation from three clinical experts, and knowledge of the research team. POs were searched for the words (as well as alternate spellings and common misspellings) and sets of words (and various word orders) using computerized algorithms developed by a consulting company specializing in this type of work (Edgeworks Technology, Inc). The validity of POs classified as not containing any relevant words related to our outcomes was checked in an iterative process by research assistants and then by repeating revised electronic searches. POs classified as containing

relevant words were manually coded for indications of incontinence prevention and other outcomes of interest by the research assistants. Examples of orders for incontinence prevention included specific interventions (e.g., start toileting program to prevent incontinence) as well as more general protocols (e.g., implement incontinence prevention protocol). Inter-rater reliability of the coders was periodically assessed; percent agreement of 85% for 32,000 POs increased to 95% to 100% for 102,119 POs with additional training and maintaining a written log of coding decisions. All differences in coding were reconciled. Approximately 2.3 million POs were reviewed and coded.

Predictor Variables

Variables that potentially predict the receipt of incontinence prevention were identified from a review of the literature, expertise of the investigators, and consultation of the clinical experts. Potential predictors available in the data sets were defined using individual MDS items and established scales with good psychometric properties when possible as multiple items on a record may relate to the same concept. Where no scale existed, composite variables were developed. Potential resident level predictors included demographic characteristics, measures of physical health (such as deficits in activities in daily living (ADLs) and comorbidities, and mortality risk. Other predictors were indicators of cognitive and emotional status (e.g., cognitive deficits and depression). These variables were also used to describe the cohort characteristics (Tables 1 and 2). In developing composite measures of resident level predictors, previously established procedures were followed.¹⁸ Scales and composite variables were coded so that a higher score indicated a worse status.

Composite variables for predictors at the NH level were developed for facility deficiencies, staffing, and percentages of residents receiving Medicaid and by gender, race, and ethnicity of NH admissions. Variables for NH facility deficiencies were created in the four areas of resident behavior and facility practices, dignity and quality of care, resident assessment, and nursing services by summarizing the scope and severity levels of the respective deficiencies in a NH. A variable for the total number of deficiencies of interest by NH was also constructed. Predictor variables were created for the different types of NH staff. Nursing staff included licensed nurses (registered nurses and licensed practical nurses) and certified nursing assistant/medication aides (CNAs).

The sociodemographic and socioeconomic characteristics of the communities surrounding the NHs included the percentage/proportion of their Census tracts that was male or female aged <65 years old and 65+ years, working class, in the various minority groups, educated for 1–8 years or 9–16 years, residing in an urban area, urban cluster, or rural area, or below poverty level. The median home value, poverty rank, and Census division of the tract were other variables.

Relevant predictors were considered for inclusion in the models if bivariate associations with the outcome of incontinence prevention were at $p < .05$ level. Associations among predictor variables were also performed to assess collinearity. If a resident level and NH or community level variable were highly correlated, the resident level variable was included in the model as it was more specific. Potential predictors included in the model of disparities in incontinence prevention at admission were age, limitations in ADLs, cognitive deficits,

comorbidities, poor nutrition, vision problems, percentage of NH residents receiving Medicaid, and the total number of deficiencies in NH quality of care.

Statistical Analysis

Data were summarized using descriptive statistics appropriate to their level, but differences in characteristics among groups at NH admission were not formally tested for significance as the large sample size would render small differences as statistically significant and not benefit interpretation. The Peters-Belson method^{19,20} was used to assess racial and ethnic disparities in the prevalence of incontinence prevention at NH admission. The first step of this method built a logistic regression model of factors associated with incontinence prevention for a presumed advantaged group, in this case, White NH admissions. The second step modeled the outcome for each presumed disadvantaged group (the minority racial or ethnic groups) that would be expected if its members were part of the White group by applying the regression coefficients (beta weights) from the advantaged group model to the data of members of each minority group separately. The overall disparity in the Peters-Belson method is the difference between the outcome observed in Whites and the outcome observed in each minority group. A significant disparity unexplained by predictors in the model represents the race and ethnicity-based disparity between the White and minority group.¹⁹ The unexplained disparity is the difference between the proportion of a minority group expected to receive incontinence prevention and the proportion that was actually observed to receive the prevention, and its statistical significance was assessed using a one-sample two-sided log-rank test.²⁰ Due to the clustering of residents within NHs, unmeasured NH confounders were controlled for by insuring that residents of each minority group of interest were in the NHs of Whites whose modeling coefficients were applied to the racial or ethnic group being modeled. We refer to these NHs as mixed race NHs, which may have also included other minority groups. All data management was completed using SAS software v. 9.3 (SAS Institute, Inc., Cary, NC); descriptive statistics were performed using SPSS software v. 22 (Chicago, IL). Steps of the Peters-Belson analysis were conducted using R software v. 2.14. All results were considered statistically significant if $p < .05$.

Results

Characteristics of the Cohort

The cohort of older adults free of any incontinence at NH admission comprised 38% ($n = 42,693$) of all admissions. They were in 451 NHs located in 27 states and all 9 Census divisions. The characteristics of the racial and ethnic groups of the cohort are presented in Tables 1 and 2. The average age of admissions across racial and ethnic groups was more than 75 years, and less than half of each group was male (Table 1). A greater percentage of Whites and APIs had at least a high school education. APIs had the lowest BMI and a higher percentage were tube-fed than other groups. All groups had a moderate deficit in ADLs and mortality risk. APIs and Whites had a higher mortality risk than other groups. Whites received the most medications per week followed by Blacks. Blacks had more comorbidities on average, but fewer Blacks had bowel problems. A higher percentage of Whites had oxygenation and perfusion problems. Poor nutrition and impairments in vision were present

in approximately one-third of all groups on average. Pressure ulcers were present in 6% to 10% of the groups and were lower among Hispanics and Whites.

In terms of cognitive and emotional characteristics, Blacks had more cognitive deficits than other groups but the degree of deficits were moderate among all groups (Table 2). Delirium was less common in Blacks and Hispanics. APIs had the most communication difficulties while more AIANs showed signs of depression compared to other groups.

Characteristics of the Nursing Homes and Surrounding Communities

Staffing by CNAs, who are involved with implementing incontinence prevention interventions in residents, was 2.20 (2.13) CNA hours/resident/day (mean (sd)). Staffing by licensed nurses was approximately half of that at 1.09 (0.48) licensed nurse hours/resident/day. The total number of deficiencies of interest of a NH was 3.78 (2.35) (mean (sd)), and their deficiency index was 7.59 (6.30). The overall percentage of residents in the NHs receiving Medicaid assistance from the US government was 73.8 (15.9) (mean (sd)). The NHs were located in communities with diverse racial and ethnic populations, although the percentages of minorities in many of the communities were small (Table 3). A majority of NHs tended to be in working class communities and located in more highly urban areas.

Disparity in Incontinence Prevention

Only 12% of older adults received incontinence prevention interventions at NH admission. The overall percent disparity in incontinence prevention between White residents (10.6%) and Black residents (8.6%) was 2%. There was a significant disparity in incontinence prevention unexplained by predictors in the model for Black admissions. The percentage of Blacks observed to receive incontinence prevention (8.6%) was smaller than what was expected had they been part of the White group (10.6%). Table 4 lists the significant predictors for receiving incontinence prevention: having greater deficits in ADL function and cognition and more comorbidities. The percent of disparity unexplained by covariates in the model was 97.5%. There was no significant disparity disadvantaging any other minority group.

Discussion

Prevention of incontinence in NHs is understudied. In a systematic review of care practices in nursing homes related to urinary incontinence, Roe et al.²¹ did not find any studies that addressed maintenance of continence of nursing home residents. This is one of the few studies that examined this topic and findings reveal that incontinence prevention at NH admission was not common; only 12% of continent older NH admissions received interventions for primary prevention of incontinence. The prevalence of incontinence in for-profit US NHs has been between 37% and 35% from 2011–2014, suggesting that a majority of residents could benefit from prevention of incontinence.²²

In addition, this is the first study to our knowledge to reveal disparities in incontinence prevention, which were found for Black NH admissions. Results show that Black individuals admitted to a NH free of incontinence were less likely to receive incontinence prevention than would be expected had they been in the White group. Predictors for receiving

incontinence prevention (greater deficits in activities of daily living and cognitive function and more comorbidities) show that adults with greater frailty/disability are more likely to receive prevention. In our method of assessing this disparity, when the characteristics of Black admissions were used in the model developed in Whites to estimate the odds of receiving incontinence prevention, it was as if we were examining a hypothetical population of Black admissions with the same clinical and care characteristics as the Whites. The large percentage of unexplained disparity shows that incontinence prevention was less than expected considering the clinical and care characteristics of Black admissions. For example, Black admissions had greater cognitive deficits but even after adjusting for this factor, fewer Blacks received incontinence prevention.

Eliminating the racial disparity in incontinence prevention is critical as the use of NHs by minorities is rising, and their levels of physical and cognitive impairments are predicted to increase;^{10,11} these changes have potential to widen the gap in incontinence prevention. The relatively small overall disparity in incontinence prevention for Blacks suggests that its eradication may be feasible. Comprehensive recommendations for achieving equity in health care have been developed and foremost is identification of disparity, which this study addresses. Other strategies include implementation of a quality improvement process, staff training and reward for positive performance, restructuring care as needed, and organizational commitment. Progress in reducing disparities should be monitored and there should be greater transparency in reporting performance outcomes by race and ethnicity.^{23,22} Others^{16,24} assert that eliminating disparities in NH care also requires policies that promote better quality of care and providing minority groups with greater access to high quality, local NHs.

Although there have been calls to develop ways to identify those NH residents who might benefit most from prevention interventions in the interest of cost effective resource utilization, no such methods are yet available.⁹ Maintaining continence is a goal for maintaining personal dignity and reducing morbidity as well as for healthcare economy. Our results suggest that greater efforts for instituting incontinence prevention at the time of NH admission are needed. An international group of experts supported primary prevention of incontinence in older adults and proposed that prevention begin while the elderly are living in the community.²⁵ Due to the heterogeneity of the older population, multidimensional prevention strategies were suggested including awareness and education about incontinence, improvement of strength and balance, and pelvic floor muscle exercises.

Among the strengths of our analyses is the screening of and adjustment for variables at multiple levels which were potentially associated with disparity in incontinence prevention, thus avoiding the fallacy that patterns in complex population outcomes are due solely to individual-level characteristics.²⁶ The NH characteristics show that total nursing staffing (licensed nurse + CNA) levels were at the preferred level per federal recommendations.²⁷ The average percentage of residents receiving Medicaid met the criterion for the upper tier of quality of NH care as assessed by Mor et al.¹⁶ The average percentage of residents for whom Medicaid was the primary payor ranged from 50–85% in 2006–2011 (averaging approximately 65–64% of residents) as states have varying patterns of payment.²⁸ The characteristics of the communities surrounding the NHs are among the most descriptive that

have been reported and can serve as benchmarks for future studies of disparities in NHs. Furthermore, use of predictors utilizing multi-item scales maximizes the information obtained from the available data and has been shown to promote accuracy of statistical models, including those using MDS data.²⁹ The POs that were linked with MDS records provided a unique resource that enhanced identification of our outcome. Another strength is that our data (individual, NH and community) were all collected during the same period of time. A unique aspect of this study is its focus on and characterization of NH admissions. Advantages of the Peters-Belson method for analyzing racial and ethnic disparities are explained in more detail elsewhere.²⁰

There are several limitations to this study. Results are primarily generalizable to for-profit NHs, which comprise the majority (71%) of US NHs.²² We have shown that the characteristics of our admission cohort are comparable to those of all US NHs including non-profit NHs.¹ However, these results may not be representative of residents in all NHs. As demographic and clinical characteristics of admissions/residents to NHs change over time, approaches to care, such as incontinence prevention, which aim to be resident-centered and equitable need to take such changes into consideration. Not all relevant predictors of incontinence prevention may be known, available in our datasets, identifiable by screening procedures, or possible to include in our models. For example, other factors that may be associated with instituting incontinence prevention at NH admission such as knowledge and attitudes of NH staff³⁰ were unable to be measured in this study. We assumed that care ordered was provided to residents, but confirmatory information is lacking. We used the most recent US Census records that were available at the start of our analyses. Given the years since our data, there have been changes in regulations of NH care that have come into effect;³¹ these regulations promote individualized care planning for incontinence management but do not address primary prevention of incontinence. NH nursing staffing is now evaluated using an expanded matrix approach adjusted for resident case-mix. Considering the limitations, we believe our findings are highly relevant as incontinence remains a major problem of NH residents.²² Results encourage future studies that improve understanding of barriers to carrying out prevention strategies in NH and approaches to mitigate racial disparities in prevention.

Conclusions

The results of this study provide much needed insight about incontinence prevention in NHs. They also address the current priority of US health policy on increasing evidenced-based understanding of the epidemiology of disparities in NH care. Findings reveal that incontinence prevention is not widely practiced. They encourage NHs to increase incontinence prevention starting at the time an older person is admitted to a NH while eliminating racial disparities in these efforts. Results of this study can be used to develop strategies for improving equity and quality of NH care.

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Demographic and Physical Characteristics by Race and Ethnicity of Older Nursing Home Admissions Free of Incontinence

Table 1

Variable/Scale	MDS Item	American Indian, Alaskan Native	Asian, Pacific Islander	Black	Hispanic	White
# of Admissions	Score range	n = 229	n = 530	n = 2,615	n = 618	n = 38,698
mean (sd)						
Age at Admission	AA3, AB1	77.92 (8.18)	81.58 (7.25)	79.14 (8.18)	78.78 (8.10)	81.33 (7.52)
Activities of Daily Living Deficit Score ^a	GIaA, GIbA, GIcA, GIeA, GIhA, GIiA, GIjA Score Range 0–28	8.32 (6.45)	12.88 (5.38)	9.68 (6.63)	10.58 (6.60)	10.07 (6.30)
Body Mass Index	K2a–b	25.64 (5.28)	23.02 (3.86)	25.95 (5.48)	26.40 (5.11)	25.63 (5.19)
Comorbidity Index <i>Charlson Index</i> ^b	I3a–e, and/or I1 Score Range 0–30	1.91 (1.48)	1.85 (1.65)	2.12 (1.61)	1.98 (1.66)	1.61 (1.50)
Medications Number per Week	O4a–e Score Range 0–35	4.61 (5.10)	3.03 (4.42)	5.28 (5.54)	4.99 (5.74)	6.30 (5.97)
Mortality Risk <i>CHESS</i> score ^c	B6, G9, J1c, J1g, J1i, J1o, K3a, K4c, J5c Score Range 0–5	1.28 (1.14)	1.86 (0.94)	1.31 (1.04)	1.31 (0.98)	1.63 (1.05)
n (%)						
Male Gender	AA2	98 (42.8)	182 (34.3)	1,000 (38.2)	254 (41.1)	11,887 (30.7)
High School or Higher Education	AB7	91 (39.7)	298 (56.2)	947 (36.2)	206 (33.3)	24,143 (62.4)
Bowel Problems	H2b–d, I2b	36 (15.7)	147 (27.7)	281 (10.7)	86 (13.9)	7,206 (18.6)
Oxygenation Problems <i>Number of Indicators</i>	J1b, J1k–l, P1ag, P1ai–j, P1al, P1bdA					
1		18 (7.9)	50 (9.4)	217 (8.3)	68 (11.0)	4,462 (11.5)
2		26 (11.4)	31 (7.7)	228 (8.7)	59 (9.6)	5,335 (13.7)
Perfusion Problems <i>Number of Indicators</i>	J1a, J1c–d, J1g					
1		41 (17.9)	133 (25.1)	629 (24.1)	119 (19.3)	10,692 (27.6)
2		1 (0.4)	18 (3.4)	31 (1.2)	17 (2.8)	969 (2.5)
Poor Nutrition <i>Number of Indicators</i>	K3a, K4c					
1		70 (30.6)	224 (42.3)	838 (32.0)	186 (30.1)	14,407 (37.2)
2		15 (6.6)	55 (10.4)	102 (3.9)	33 (5.3)	2,520 (6.5)
Pressure Ulcer Highest Stage of 2, 3, or 4	M2a	23 (10.0)	49 (9.2)	217 (8.3)	38 (6.1)	2,293 (5.9)
Tube Feeding	K5b	3 (1.3)	17 (3.2)	34 (1.3)	11 (1.8)	477 (1.2)
Vision Impairment <i>Number of Indicators</i>	D1, D2a, D2b					
1		43 (18.8)	106 (20.0)	690 (26.4)	123 (19.9)	7,631 (19.7)
2		17 (11.8)	34 (6.4)	309 (11.8)	69 (11.1)	3,793 (9.8)

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^aMorris JN, Fries BE, Morris SA. Scaling ADLs within the MDS. *J Gerontol A Biol Sci Med Sci*. 1999;54:M546–53.

^bCharlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: Development and validation. *J Chronic Dis*. 1987;40:373–83.

^cHirdes JP, Frijters DH, Teare GF. The MDS-CHES scale: A new measure to predict mortality in institutionalized older people. *J Am Geriatr Soc*. 2003;51:96–100.

Cognitive and Emotional Characteristics by Race and Ethnicity of Older Nursing Home Admissions Free of Incontinence

Table 2

Variable/Scale	MDS Item	American Indian, Alaskan Native n = 229	Asian, Pacific Islander n = 530	Black n = 2,615	Hispanic n = 618	White n = 38,698
# of Admissions	Score Range					
mean (sd)						
Cognitive deficits <i>MDS-COGS</i> Score ^a	B2a, B2b, B3b, B3d, B3e, B4, C4, G1gA Score Range 0–10	1.72 (2.07)	1.73 (1.92)	2.28 (2.33)	1.77 (2.29)	1.72 (2.16)
Communication Difficulty Score	C1, C5, C6, C3b–f Score Range 0–9	0.89 (1.3)	1.16 (1.42)	0.70 (1.04)	0.85 (1.20)	0.74 (1.11)
n (%)						
Delirium <i>MDS-CAM</i> ^b	B5a–f, B6, E5					
Subsyndromal delirium level 1		41 (17.9)	79 (14.9)	227 (8.7)	63 (10.2)	4,577 (11.8)
Subsyndromal delirium level 2 or full delirium		15 (6.6)	34 (6.4)	151 (5.8)	23 (3.7)	2,781 (7.2)
Depression ^c Any	E1a, E1d, E1f, E1h, E1i, E1m	70 (30.6)	81 (15.3)	497 (19.0)	127 (20.6)	10,308 (26.6)

^aHartmaier SL, Sloane PD, Guess HA, Koch GG. The MDS cognition scale: A valid instrument for identifying and staging nursing home residents with dementia using the Minimum Data Set. *J Am Geriatr Soc.* 1994;42:1173–79.

^bDosa D, Intrator O, McNicoll L, Cang Y, Teno J. Preliminary derivation of a nursing home confusion assessment method based on data from the Minimum DataSet. *J Am Geriatr Soc.* 2007;55:1099–1105.

^cBurrows AB, Morris JN, Simon SE, Hirdes JP, Phillips C. Development of a Minimum Data Set-based depression rating scale for use in nursing homes. *Age Ageing.* 2000;29:165–72.

Table 3

Characteristics of Census Tract of Community around Nursing Homes

	% American Indians/ Asians/ Pacific Islanders ¹ in Census Tract	% Non- Hispanic Blacks in Census Tract	% Hispanics in Census Tract	% Non- Hispanic Whites in Census Tract	% Census Tract below poverty	% Working class in Census tract	% of Census tract in an urban area	% of Census tract in a rural area
Level of Census Tract Characteristic	n (%) of Nursing Homes							
< 25%	434 (97.3) ²	388 (87.0)	406 (91.0)	17 (3.8)	406 (91.0)	2 (0.4)	210 (47.1)	342 (76.7)
25 to < 50%	10 (2.2)	34 (7.6)	28 (6.3)	41 (9.2)	38 (8.5)	46 (10.3)	1 (0.2)	36 (8.1)
50 to < 75%	0 (0.0)	17 (3.8)	9 (2.0)	74 (16.6)	2 (0.4)	332 (74.4)	13 (2.9)	9 (2.0)
75%	2 (0.4)	7 (1.6)	3 (0.7)	314 (70.4)	0 (0.0)	66 (14.8)	222 (49.8)	59 (13.2)

¹ Racial/ethnic categories are according to US Census;

² For example, 97.3% of NHs in our sample were located in Census tracts with <25% American Indian/Asian/Pacific Islander population

Table 4

Significant^a Predictors of Receiving Incontinence Prevention at Nursing Home Admission Used in Modeling Disparities for Black Residents

Predictors OR (95% CI)			
	Activities of Daily Living Deficit Score ^b	Comorbidity Index ^c	Cognitive Deficits Score ^d
Whites in Mixed Race Nursing Homes	1.05 (1.05–1.06)	1.04 (1.01–1.07)	1.15 (1.13–1.17)

^a significant at p <0.05

^b Morris JN, Fries BE, Morris SA. Scaling ADLs within the MDS. *J Gerontol A BiolSci Med Sci.* 1999;54:M546–53.

^c Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: Development and validation. *J Chronic Dis.* 1987;40:373–83.

^d Hartmaier SL, Sloane PD, Guess HA, Koch GG. The MDS cognition scale: A valid instrument for identifying and staging nursing home residents with dementia using the Minimum Data Set. *J Am Geriatr Soc.* 1994;42:1173–79.