POTENTIALLY PREVENTABLE EMERGENCY DEPARTMENT VISITS AMONG THE U.S. NURSING HOME POPULATION

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By

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ABSTRACT

Racial minorities account for roughly 16% of the U.S. nursing home population. As more facility- and resident-level data have become available, racial disparities in nursing homes have become a greater focus for health policy analysts. Existing studies have found that blacks are more likely than whites to reside in nursing homes with fewer nurses, poorly trained executive staff, and a greater number of regulatory deficiencies. The purpose of this study is to examine whether racial disparities occur in potentially preventable emergency department visits. Using the 2004 National Nursing Home Survey, I constructed a logistic regression model to examine the extent to which race and other variables – sex, age, any falls or fractures in the 6 months prior to interview, payment source, facility ownership type, and facility location – are associated with potentially preventable emergency department visits. The regression results did not find a statistically significant relationship between race and potentially preventable emergency department visits. While this finding did not support the study’s hypothesis, the analysis did present suggestions for further research. Including additional questions in future surveys could contribute to a broader understanding of racial disparities in U.S. nursing homes, such as asking residents if they feel discriminated against by health care providers or other staff or if they feel they can openly engage in cultural activities. Answers to questions of this type may help determine if discrimination exists and in what ways it is manifested.
ACKNOWLEDGEMENTS

It would be impossible to take for granted how much the faculty and staff of the Georgetown University Public Policy Institute have done for me these past two years. In their own unique way, they have each contributed to the body of knowledge and skills needed to complete this thesis. My heaviest debt at Georgetown will not be student loans, but rather the priceless amount of time and generosity that is not in my power to repay. In particular, I give special thanks to my thesis advisor, Professor Harriet Komisar, PhD, for without her patience, encouragement, and knowledge, this study would never have been completed. I also want to thank Kerry Pace, Assistant Dean of the MPP Program, who reminded me that struggle and failure are not one in the same. Lastly, I thank my parents, two immigrants who provided me with the educational opportunities they wanted but could never have. I have had considerable assistance in my life to be grateful for. Every time I look back at my years at Georgetown, I will remember that Isaac Newton is not the only person to have stood on the shoulders of giants.

Many thanks,
Theresa R. Berry
# Table of Contents

Abstract................................................................................................................................. iii

Acknowledgements ........................................................................................................... iv

Introduction ......................................................................................................................... 1

Literature Review ............................................................................................................... 3

Conceptual Framework ....................................................................................................... 7

Data and Methodology ....................................................................................................... 9

Regression Results............................................................................................................. 15

Discussion............................................................................................................................ 18

References ........................................................................................................................... 20
INTRODUCTION

Despite nationwide and local efforts, gaps persist between African Americans and whites in health status, life expectancy, and mortality rates (IOM, 2002; Farmer and Ferarro, 2005; Burgess, Fu and van Ryn, 2004). Simultaneously, national health care costs are projected to reach 19.6% of GDP in 2019, and policymakers and analysts have placed increased importance on identifying areas for cost savings (CMS Office of the Actuary, 2010). As a result, there exist two problems at hand: African Americans needing more and/or better health care, and a perceived need to lower national health expenditures.

The racial health gap relevant to this study is quality of care in nursing homes. Numerous studies have been published on specific areas of concern regarding race and nursing home care -- e.g., staffing, quality of care, and vaccination status -- but there is relatively little literature on disparities in emergency department (ED) visits by African American and white residents, and how many of those visits could have been avoided. In 2004, an estimated 50,300 nursing home residents were sent to the ED for an acute condition that could have potentially been treated within the nursing home or prevented altogether. This type of ED visit is what the CDC and this study refers to as potentially preventable ED visits (Caffery, 2010).^a

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^a An ED visit whose primary reason for occurring is a condition associated with preventable visits. The conditions, as defined by the CDC are: Fever: includes high temperature; Chest pain: excludes heart pain; Other symptoms or problems relating to psychological and mental disorders, NEC, includes: can’t cope, going crazy, losing my mind, disoriented, difficulty concentrating, trouble concentrating, hate everybody, mood fluctuation, mood swings, blunted affect, constricted affect, peculiar thinking, inhibited, non-communicative, communications issues, déjà vu feelings, psychological problems (NOS), wandering around; and excludes: character disorder and personality disorder; Gastrointestinal bleeding; Urinary tract infection (NOS): includes genitourinary infection and urine infection; Other endocrine, nutritional, and metabolic diseases: includes hypoglycemia, hyperlipidemia, hypercholesterolemia, disorders of intestinal absorption, ovarian dysfunction, poor nutrition, low blood sugar; Other heart disease: includes cardiac dysrhythmias, atrial fibrillation, paroxysmal tachycardia, congestive heart failure, heart failure, heart murmur, premature ventricular contractions (PVCs), mitral valve prolapse; Pneumonia: includes viral pneumonia, bacterial pneumonia, bronchopneumonia, pneumonitis.; Carbuncle, furuncle, boil, cellulitis, abscess, NEC; Impetigo; Seborrheic dermatitis: includes: dandruff; Eczema and dermatitis, NOS; Psoriasis; Other diseases of the
As of this study’s date of publication, researchers have data indicating how residents’ finances, facility characteristics, and medication misuse are associated with the likelihood of experiencing unnecessary ED care. However, there is limited data on the significance of nursing home residents’ race to ED visits. Using data from the 2004 National Nursing Home Survey (NNHS), this study will add to existing research by examining the relationship between race and ED visits by using a binary logistic regression to control for non-race variables that also might potentially affect ED visits. This study will add to the understanding of factors potentially associated with potentially preventable emergency department (PPED) visits among nursing home residents, offer informed policy recommendations, and suggest areas for further research in order to prevent PPED visits among the U.S. nursing home population.

skin: includes allergic skin reactions, pilonidal cyst, urticaria, hives, keloid, keratosis, sebaceous cyst, paronychia, lupus erythematosus discoid, epidermal inclusion cyst, poison ivy, poison oak; and excludes cyst (NOS), Acne.
LITERATURE REVIEW

Despite the health implications and high costs of ED visits that could potentially have been prevented among the nursing home population, there exists relatively little background literature on the subject. To date, prior literature on the subject has been primarily focused on the elderly population in general (non-residents and residents) or solely on specific predictors of potentially preventable ED visits (i.e., misuse of medications, nursing home characteristics, nursing home staff characteristics, or the effect of the doctor-patient relationship on ED use). Existing literature also utilizes a variety of surveys, such as the National Ambulatory Medical Care Survey (NAMCS), the On-line Survey, Certification, and Reporting (OSCAR), the Minimum Data Set (MDS) for Nursing Homes, and local surveys that do not represent the nursing home population at large. However, few of the existing studies focus on two aspects of interest in this study: 1) potentially preventable ED visits by nursing home residents, and 2) race as a predictor of a potentially preventable ED visits by nursing home residents. Because no similar studies exist today, this literature review will focus on studies that empirically examine relevant questions to this study—potentially preventable ED visits by elderly nursing home residents (not identified by race), potentially preventable ED visits by elderly non-residents, and racial disparities in nursing homes in general.

Studies on potentially preventable ED visits by nursing home residents

In April 2010, the National Center for Health Statistics (NCHS) released a data brief, “Potentially Preventable Emergency Department Visits by Nursing Home Residents: United States, 2004.” For the first time, the CDC used the 2004 National Nursing Home Survey (NNHS)
to examine the number of U.S. PPED visits by nursing home residents, as well as the health conditions and consequences associated with the visits. The report was stark: 8% of the residents studied had had an ED visit within the 90 days prior to being interviewed; of this 8%, 40% had a potentially preventable ED visit. Overall, this pioneer data brief aptly summarized key information on the topic of ED visits by nursing home populations. It clearly delineated the number of ED visits, the number of preventable visits, and the common causes (Caffery, 2010). These data are an excellent foundation for this study, which will go one step further and examine how race relates to PPED visits, if at all.

Existing literature on potentially preventable emergency department visits has not specifically explored possible racial disparities, but it has identified several other major variables associated with PPED visits by both nursing home residents and non-residents. While this is not directly relevant to this study, it does offer information on factors other than race that are associated with having a potentially preventable ED visit. This is important because it helps other researchers know how to best form empirical models on PPED visits among all age groups, regardless of whether they are residents or non-residents. Variables empirically shown to be related to PPED visits are inappropriate use of medications and various facility characteristics.

*Inappropriate Use of Medications.* Budnitz and colleagues (2007), using the Beers criteria to identify inappropriate use of medications in older adults, found that among Americans 65 years of age or older, approximately 177,504 emergency department visits for adverse drug events occurred in 2004 and 2005; 3.6% of these visits were for adverse events caused by medications considered to be always potentially inappropriate. Studies by Hamilton and colleagues (2009), Lund and colleagues (2010), and Van Der Hooft and colleagues (2005) also
documented the likelihood and dangers of adverse events due to inappropriate medication use among the elderly.\(^b\)

*Facility Characteristics.* Young and colleagues (May 2010), in a study of New York nursing home residents, found that facilities with more highly trained staff and on-site physicians were correlated with fewer ED visits. In another small study in New York, Young and colleagues (March 2010) indentified four other possible predictors of ED utilization among nursing home residents: physician and nurse practitioner accessibility by pager, how highly the facility’s physicians were paid to care for acutely ill residents, resident family preferences, and access to medical history and EKG reports. Intrator and colleagues (1999) made a similar conclusion in an earlier study published in 1999. They found that nursing homes with special care units, more physicians, and any nurse practitioners or physician assistants were less likely to hospitalize residents. While this particular article did not focus specifically on ED visits but hospitalization in general, the same principle still applies—the nursing home was unable to provide the necessary care inside the facility and sought outside hospital assistance. Overall, existing literature on residents and nursing homes seems to indicate that the quantity and quality of staff are directly correlated with the general hospitalization of U.S. nursing home residents. This consistent finding suggests that residents who live in facilities with numerous qualified staff would also be less likely to have a PPED visit.

**Studies on racial disparities in quality of care for nursing home residents**

\(^b\) It should be noted, however, that the Beers criteria is not accepted as the most accurate test of appropriateness by some medical researchers (Levy et al., 2010), and some researchers have found Beers criteria medications to not be significantly correlated with adverse events in the elderly (Page and Ruscin, 2006).
Studies conducted over the past several decades have documented the various ways in which health disparities between blacks and whites exist at every stage of life, including old age. Specifically among the nursing home population, racial disparities have been found in the areas of facility quality, quality of care, access to care, advance care plan documents, hospice use, in-hospital deaths, secondary stroke prevention, and receipt of influenza and Pneumococcus vaccinations (Castle et al., 2009; Christian et al., 2003; Degenholtz et al., 2002; Grabowski and McGuire, 2009; Kwak et al., 2008; Li et al., 2010; Mor et al., 2004; Pourat et al; 2001; Rich et al., 2009; Smith et al. 2008; Smith et al. 2007; Troyer et al. 2006; and Welch et al. 2005). Thus, the many ways in which black nursing home residents suffer health disparities compared to their white counterparts are well documented. This evidence suggests it is likely health disparities exist in PPED visits as well.
CONCEPTUAL FRAMEWORK

When racial disparities in health care exist, a racial or ethnic group not treated appropriately is more likely to experience adverse health events, such as potentially preventable emergency department visits. For example, holding all else constant, evidence of a health disparity would be a situation in which a white and black nursing home resident with the same medical condition experience different health outcomes at the same time; however, the white resident is treated in a hospital or the nursing home, and the black resident is sent to the emergency department. The health provider’s decision to bring the black resident to the ED implies that his/her condition reached a point at which it was too severe and complicated to be treated in the nursing home. In this situation, the disparity is clear: the white resident experienced a better health outcome than the black resident, despite the fact that they were similar in all respects but race. The various factors associated with this outcome are less clear. Identifying what these factors are is the first step toward determining if the disparity occurs because the persons were of two different races (one less favored by health providers than the other), or if other factors, such as sex or age, are more related to the disparity.

The large body of research on racial disparities in health care suggests that nursing homes with highly paid doctors and nurses, sufficient number of certified nursing assistants, special care units, and access to patients’ medical histories are the least likely to have residents who experience potentially preventable adverse health events, including ED visits. These nursing homes are typically located in middle and upper class white communities; the most deficient are typically located in low-income, minority communities. This dynamic results in differences between white and black health outcomes, as one race is more likely than the other to receive
overall good quality health care (Mor V, Zinn J, Angelelli J, Teno JM, and Miller SC 2004). As noted above, researchers have published findings indicating this is the case. Facility quality, quality of care, access to care, advance care plans, hospice use, in-hospital deaths, secondary stroke prevention, and receipt of influenza and Pneumococcus vaccinations vary between races, often in favor of white residents who are middle- or upper-class.

The hypothesis of this study is rooted in the large body of literature and empirical analysis that documents racial disparities in health care at all stages of life. Empirically, this study will test the author’s hypothesis that blacks are more likely than whites to have a potentially preventable emergency department visit.
DATA AND METHODOLOGY

Data Set

The data used in this study is from the National Nursing Home Survey (NNHS), 2004. The questionnaires, datasets, and related documentation from the NNHS are provided by the CDC’s National Center for Health Statistics. The sample design for the survey is a stratified, two-stage probability design. In the first stage, each nursing facility was placed into a stratum by bed size and metropolitan status. Nursing homes were then selected by using systematic sampling with probability proportional to their bed sizes. In the second stage, up to 12 residents from each facility were selected by using a sampling module, which randomly selected 12. With an overall response rate of 78 percent, 1,174 nursing home facilities and 13,507 residents participated in the survey.\(^c\) Data on the subjects were collected by surveyors interviewing facility staff with access to resident medical records. No resident was interviewed directly.

Study Population

The study population consists of 13,504 nursing home residents selected by using a sampling module in the CAPI system, which randomly selected 12 residents from 1,174 participating nursing homes. Resident races are categorized as black, white, and other.\(^d\) A potentially preventable ED visit is defined as an ED visit that could have potentially been prevented if proper monitoring or treatment had taken place. Since it is impossible to precisely

\(^c\) In the NNHS, 1,500 nursing homes were randomly selected to participate from a sampling frame of 16,628 nursing homes; 283 refused and 43 were not eligible to complete the survey, so 1,174 responded or 81 percent. When using this data set, I did not include the three facilities with only one resident respondent (singletons). Additionally, 14,017 residents were selected from these facilities; 502 refused and 8 were not eligible, so 13,507 responded or 96 percent. Thus, the overall response rate for the resident portion of the NNHS was approximately 78 percent.

\(^d\) Other includes American Indians, Alaskan Natives, Asians, and Pacific Islanders.
determine which visits could have been prevented, researchers instead look to the diagnosis of ED residents that alone should not have required an ED visit. This study specifically examines potentially preventable ED visits as defined by the diagnoses used by the CDC in a data brief on potentially preventable emergency department visits, which is coded in accordance with the 1997 Reason for Classification Codes (Caffery, 2010). The diagnoses examined are: Fever (1010.0); Chest pain (1050.1); Other symptoms or problems relating to psychological and mental disorders, NEC (1165.0); Gastrointestinal bleeding (1580.0); Urinary tract infection, NOS (1675.0); Other endocrine, nutritional, and metabolic diseases (2215.0); Other heart disease (2520.0); Pneumonia (2630.0); Carbuncle, furuncle, boil, cellulitis, abscess, NEC (2800.0); Impetigo (2805.0); Seborrheic dermatitis (2810.0); Eczema and dermatitis, NOS (2815.0); Psoriasis (2820.0); Other diseases of the skin, excluding cyst, NOS, and Acne (2825.0).

**Regression Model**

In order to examine the relationship between race and PPED visits, this study utilizes a logistical regression model:

\[
\text{Log (odds of resident having a PPED visit)} = \beta_0 + \beta_1 \text{Sex} + \beta_2 \text{Age Variables} + \beta_3 \text{Race Variables} + \beta_4 \text{Any falls or fractures in the past 6 months} + \beta_5 \text{Primary Source of Payment Variables} + \beta_6 \text{For-Profit Status} + \beta_7 \text{Location}
\]

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*c The 1997 Reason for Classification Codes are on the CDC website at [http://www.cdc.gov/nchs/data/ahcd/rvc97.pdf](http://www.cdc.gov/nchs/data/ahcd/rvc97.pdf).*
Dependent Variable

The outcome variable of interest in this study is whether or not a U.S. nursing home resident had a potentially preventable ED visit within the 90 days prior to being interviewed for the NNHS. This variable has two possible outcomes: yes, measured as 1; and no, measured as 0. The study population includes 13,504 of the 13,507 residents interviewed, regardless of whether or not they had an ED visit and regardless of whether or not they answered questions regarding ED visits. Three facilities with only one resident record (singletons) were excluded from the survey prior to Stata runs to avoid having strata with one sampling unit.

As noted previously, throughout the analysis, “potentially preventable emergency department visit” will refer to an ED visit for which the primary reason for occurring is a condition associated with preventable visits.\textsuperscript{f}

Covariates

Sex: This binary variable indicates female residents. This variable was included because there are fewer males in nursing homes, and males typically have shorter stays in facilities than females. Also, on average, females live longer than males (Pourat, N, Andersen, R, and Wallace, S 2001).

\textsuperscript{f}All specific conditions are listed here. Fever: includes high temperature; Chest pain: excludes heart pain; Other symptoms or problems relating to psychological and mental disorders, NEC, includes: can’t cope, going crazy, losing my mind, disoriented, difficulty concentrating, trouble concentrating, hate everybody, mood fluctuation, mood swings, blunted affect, constricted affect, peculiar thinking, inhibited, non-communicative, communications issues, déjà vu feelings, psychological problems (NOS), wandering around; and excludes: character disorder and personality disorder; Gastrointestinal bleeding; Urinary tract infection (NOS): includes genitourinary infection and urine infection; Other endocrine, nutritional, and metabolic diseases: includes hypoglycemia, hyperlipidemia, hypercholesterolemia, disorders of intestinal absorption, ovarian dysfunction, poor nutrition, low blood sugar; Other heart disease: includes cardiac dysrhythmias, atrial fibrillation, paroxysmal tachycardia, congestive heart failure, heart failure, heart murmur, premature ventricular contractions (PVCs), mitral valve prolapse; Pneumonia: includes viral pneumonia, bacterial pneumonia, bronchopneumonia, pneumonitis; Carbuncle, furuncle, boil, cellulitis, abscess, NEC; Impetigo; Seborrheic dermatitis: includes: dandruff; Eczema and dermatitis, NOS; Psoriasis; Other diseases of the skin: includes allergic skin reactions, pilonidal cyst, urticaria, hives, keloid, keratosis, sebaceous cyst, paronychia, lupus erythematosus discoid, epidermal inclusion cyst, poison ivy, poison oak; and excludes cyst (NOS), Acne.
**Age**: A binary variable indicating age over 65 was included because younger persons are typically in better health than those 65 and older, and older persons are typically less able to recover from injuries and illnesses.

**Race (Black, White, and Other)**: This set of variables was included because it is the primary independent variable of interest. The purpose of this study is to determine race’s relationship with PPED visits. Black or African Americans generally enter nursing homes in poorer health, are more likely to reside in a nursing home that does not meet Federal standards, and less likely to be vaccinated for the flu or pneumonia than Whites and other races. The model included binary variables indicating “black” and “other race” with “white” as the reference group.

**Any falls or fractures in the past 6 months**: This binary variable was included because falls are the number one cause of PPED visits (Caffrey 2004; Berry, Sarah D, Samelson, Elizabeth J, Bordes, Malynda, Broe, Kerry and Kiel, Douglas P 2009).

**Primary source of payment variables**: NNHS 2004 asked for all sources of payment for a resident's current admission for the billing period prior to interview. To create a set of mutually exclusive categories of payment sources for the billing period prior to interview, the eight possible payment categories were coded to form four mutually exclusive sources of payment: (1) Medicare, (2) Medicaid, (3) Other, and (4) Unknown. The source of payment is important in this model because form of payment may affect quality and/or quantity of care, positively or negatively, depending on the characteristics of the source. In my regression, Medicare is used as the reference group.

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8 Other sources on the topic of race disparities in health care are KL, and Toppa, RS (2003); Grabowski, David C, and McGuire, Thomas G (2009); Kwak, Jung, Haley, William E, and Chiriboga, David A (2008); Li, Yue, and Mukamel, Dana B (2010); Mor V, Zinn J, Angelelli J, Teno JM, and Miller SC (2004); Pourat, N, Andersen, R, and Wallace, S (2001); Smith, David Barton, Zhanlian, Feng, Fennell, Mary L., Zinn, Jacqueline, and Mor (2007); and Welch, LC, Teno, JM, and Mor, V (2005).
Type of Facility (Ownership): A binary variable indicating for-profit ownership (versus not-for-profit) is included in the model because the source of the facility’s funding may impact quality and/or quantity of care (Amirkhanyan, A. 2008; Levinson, Daniel R 2009).

Location: A binary variable indicates the location of the resident’s facility in a metropolitan (in contrast to a rural) location. This variable was included because urban nursing homes are often overcrowded, understaffed, and underfunded. This often leads to adverse health outcomes among residents, which could result in ER visits. Residents in urban areas also have better access to ERs than rural residents (Reed, Susan C, Andes, Steven and Tobias, Anne Ruth 2001; Gessert, C. E., Haller, I. V., Kane, R. L. and Degenholtz, H 2006; Reed, Susan C, Andes, Steven and Tobias, Anne Ruth 2001).

Description of Study Population

Table 1 below provides a brief overview of some of the study population’s characteristics. The population is primarily white (85.7%), over the age of 65 (88.3%), and female (71.2%). White residents and females vastly outnumber African American residents and males. Additionally, 35% of residents had fallen within the 180 days prior to the interview. The primary source of payment for nursing home care varies among nursing home residents: 29.34% with Medicaid, 36.4% with Medicare, and 19.7% with other sources, and 14.56% with unknown sources. Among nursing home residents, 61.72% reside in nursing homes that are for profit, and 75.68% reside in nursing homes located in metropolitan areas.

Also in Table 1, there are three columns with PPED visit data. There are few PPED visits (40,470), and they occur mostly among white (88%), female (71%) residents over 65 years of age (88%) who live in metropolitan areas (72%) and rely primarily on Medicare (34%) to pay for
their nursing home expenses. This study conducts a logistic regression to determine if race has a relationship with PPED visits, holding all other variables in the model constant.

<table>
<thead>
<tr>
<th>Variable</th>
<th>% Total Population</th>
<th># Total Population</th>
<th># Total No PPED</th>
<th># Total Yes PPED</th>
<th>% Yes PPED of Total Population</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Total</td>
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<td>Over 65</td>
<td>Black</td>
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Table 1. Characteristics of the study population at the time of interview (unweighted estimates in italics)

Source: Author’s analysis of data from the National Nursing Home Survey, 2004

*’Other race’ includes Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, and multiple races.

**Total missing observations (weighted) for residents who fell with a PPED visit is 16,819, and total without a PPED visit is 0.
Total missing observations (weighted) for metropolitan residents with a PPED visit is 4,883, and total without a PPED visit is 157,540. In both cases, the missing observations can still be designated yes or no with regard to PPED visits.

***Other includes welfare, Veterans’ Affairs, out-of-pocket, and private insurance.
REGRESSION RESULTS

My analysis was focused on 13,504 of the 13,507 residents interviewed for the NNHS 2004, regardless of whether or not they had an ED visit. (Three facilities with only one resident record were excluded from the survey prior to Stata runs to avoid having strata with one sampling unit.) The outcome variable of interest was “had a potentially preventable ED visit,” coded as yes or no. I analyzed a set of resident and facility variables that, according to other relevant studies, may be associated with experiencing a potentially preventable ED visit on the resident and facility level. Resident level variables were sex, age (under or over 65), race (black, white, or other), any falls or fractures, and payment source (Medicare, Medicaid, unknown, or other). Facility level variables were type of ownership (for-profit or non-profit) and geographic location (metropolitan or micropolitan). I performed a multivariate logistic analysis to determine the relationship between each of these variables and the likelihood of having a PPED visit, focusing particularly on the independent variable of race. All statistical analyses were performed using Stata version 11.0.

From the outset, I was aware there would be significant limitations, despite the NNHS being a nationally representative study of nursing home residents in the United States. First, the outcome (PPED visit) is relatively rare, making it more difficult to obtain statistically significant results. Second, the analysis included only a few factors related to patient health status. Third, the analysis did not include a number of facility-level characteristics that would have been valuable in controlling for factors that impact resident quality of care, such as patient-to-staff ratios and employee compensation for labor. And fourth, defining and accurately determining which ED visits could have potentially been prevented is complex and highly subjective. I
adopted the definition of a PPED visit used by the Centers for Disease Control and Prevention, though even the Centers themselves acknowledge the challenge of accurately defining the term (Caffrey 2010). It is nearly impossible to know if an ED visit could have been prevented had certain health care measures been taken beforehand.

The results of my logistic regression are in Table 2 below. Residents who had fallen within the 6 months prior to the interview have higher odds (99.8% higher) than those who had not fallen to experience a PPED visit. Residents who living a nursing home in a metropolitan area had 25% lower odds of a PPED visit than residents who lived in micropolitan areas. Also, residents whose primary source of payment was “other source” (that is, a source other than Medicare or Medicaid) had 41% lower odds of a PPED visit than residents whose primary source of payment was Medicare. All other estimates in the model do not meet a statistical significance test of p < .10.
Table 2. Logistic regression analysis of the relationship between potentially preventable emergency department (PPED) visits and specified variables

<table>
<thead>
<tr>
<th>Variable (Reference Group)</th>
<th>Coefficient</th>
<th>Odds Ratio</th>
<th>P value</th>
<th>95% Confidence Interval of Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-3.167194</td>
<td>0.000</td>
<td></td>
<td>-3.703268 - 2.63112</td>
</tr>
<tr>
<td>Female</td>
<td>-.2270605</td>
<td>.7968726</td>
<td>0.135</td>
<td>.5913828 - 1.073764</td>
</tr>
<tr>
<td>Over 65</td>
<td>-.0672074</td>
<td>.9350012</td>
<td>0.768</td>
<td>.5977244 - 1.462593</td>
</tr>
<tr>
<td>Black</td>
<td>-.3628946</td>
<td>.6956598</td>
<td>0.107</td>
<td>.4471611 - 1.082256</td>
</tr>
<tr>
<td>Other Race</td>
<td>-.4584832</td>
<td>.6322419</td>
<td>0.498</td>
<td>.1676299 - 2.384597</td>
</tr>
<tr>
<td>Any Fall / Fracture</td>
<td>.692042</td>
<td>1.997791</td>
<td>0.000</td>
<td>1.513729 - 2.636645</td>
</tr>
<tr>
<td>For-Profit Facility</td>
<td>-.1364321</td>
<td>.8724655</td>
<td>0.383</td>
<td>.6418567 - 1.185928</td>
</tr>
<tr>
<td>Metropolitan</td>
<td>-.2834415</td>
<td>.7531872</td>
<td>0.061</td>
<td>.560087 - 1.012862</td>
</tr>
</tbody>
</table>

**Payment Source Variables**

<table>
<thead>
<tr>
<th>Source</th>
<th>Coefficient</th>
<th>Odds Ratio</th>
<th>P value</th>
<th>95% Confidence Interval of Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicaid</td>
<td>-.0977421</td>
<td>.9068828</td>
<td>0.563</td>
<td>.6510462 - 1.263253</td>
</tr>
<tr>
<td>Other Source</td>
<td>-.5264164</td>
<td>.5907181</td>
<td>0.005</td>
<td>.4096238 - .851874</td>
</tr>
<tr>
<td>Unknown</td>
<td>-.1137039</td>
<td>.8925222</td>
<td>0.623</td>
<td>.5671596 - 1.404536</td>
</tr>
</tbody>
</table>

Source: Author’s analysis of data from the National Nursing Home Survey, 2004
N=10503
DISCUSSION

This study examines whether there are racial disparities in potentially preventable emergency department visits in U.S. nursing homes. As noted above, there are many limitations that make the question difficult to answer with the analysis. A potentially preventable emergency department visit could be the result of inadequate care by health providers; of certain racial prejudices held by health care providers; of relationships between political processes, or general racial segregation and racial discrimination. It is likely that the true answer to this question is a complicated mix of various reasons in various circumstances that result in PPED visits.

In brief, major changes have to be made to repair the broken social, economic, and health care system that allows for PPED visits to take place, regardless of who is experiencing them. How best to do that is beyond the scope of this study, but what can be said for certain is that more data are needed. Adding additional questions to the National Nursing Home Survey would provide more information that might help answer this study’s question, e.g., 1) Asking a resident (not a staff member) if s/he feels discriminated against by health care providers or other staff; 2) Asking a resident if s/he feels like s/he can openly engage in cultural activities; or 3) Asking a resident if s/he receives assistance when needed to engage in cultural activities. Answers to questions of this type may help determine if discrimination exists and in what ways it is manifested. Of course, these answers would be prone to bias, and not all randomly selected residents would have the cognitive abilities to give answers.

It is important to note the complications with obtaining these data. A survey for residents would mean yet another questionnaire for the NNHS (or other research organization) and many additional resources would be needed to create, disseminate, and organize the collected data. The
cost of an additional or extended questionnaire, the different priorities of policymakers, and the current recession and budget cuts may make such a project unlikely. It is my hope that more studies on the minority experience in U.S. nursing homes will begin to emerge in the upcoming decade.
REFERENCES


Hamilton, HJ, Gallagher, PF, and O'Mahony, D. “Inappropriate prescribing and adverse drug events in older people.” BMC Geriatrics (January 28, 2009).


Intrator, Orna, Castle, Nicholas G, and Mor, Vincent. “Facility Characteristics Associated With Hospitalization of Nursing Home Residents: Results of a National Study.” Medical Care 37, no. 3 (March 1999): 228-237.


Mor V, Zinn J, Angelelli J, Teno JM, and Miller SC. "Driven to Tiers: Socioeconomic and Racial Disparities in the Quality of Nursing Home Care." Milbank Quarterly 82, no. 2 (June 2004): 227-256.


Young, Y, Inamdar, S, Barhydt, NR, Colello, AD, and Hannan EL. “Preventable hospitalization among nursing home residents: varying views between medical directors and directors of nursing regarding determinants.” Journal of Aging and Health 22, no. 2 (March 2010): 169-182.

Zhanlian Feng, Z, Lepore, M, Clark, M, Tyler, D, Smith D, Mor, V,Vincent Mor, and Fennell, ML. “Geographic Concentration and Correlates of Nursing Home Closures: 1999-2008.” Archives of Internal Medicine (January 2011).