

## Diabetes in Nursing Homes: United States 2004

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## **ABSTRACT**

The 2004 National Nursing Home Survey collected cross-sectional data for 11,939 NH residents aged  $\geq 65$  years, representing  $\sim 1.32$  million individuals. That year, 24.6% of NH residents had diabetes as a primary admission and/or current diagnosis. Diabetes was present in 22.5% and 35.6% of White and non-White residents, respectively. Diabetic residents were admitted more often from acute care hospitals (42.5% vs 35.3%), were more likely to have length of stay  $\leq 100$  days (22.6% vs 20.1%) and took more medications (10.3 vs. 8.4). Diabetic residents had a 39% higher odds of having emergency department visits in the previous 90 days and 56% higher odds of having a pressure ulcer at the time of the survey. In the United States in 2004, 1 in 4 nursing home residents  $\geq 65$  years had diabetes and diabetic residents had increased odds of several unfavorable outcomes that are important for care planning.

There is an incomplete picture of DM in institutionalized populations, including older adults in nursing homes (NH). This report defines the prevalence of DM in U.S. NHs and examines ethnic disparities, ADLs, reasons for admission, payment sources, length of stay (LOS), pressure ulcers, emergency department (ED) visits and medication usage among diabetic residents.

## METHODS

The 2004 National Nursing Home Survey (NNHS) is based on data collected in 1,174 NH with data for 13,507 residents (1). Primary diagnosis codes at the time of admission and at the time of survey (current) and up to 15 current secondary diagnosis were collected.

Race/ethnicity, current age, living arrangements prior to admission, and sources of payment were recorded. LOS was calculated at the time of the survey. Activities of daily living (ADLs) were collected including bed mobility, transfer, dressing, eating, toileting, personal hygiene and bathing. Residents were coded as 1 of 5 categories: independent, requires supervision, requires limited assistance, requires extensive assistance, and total dependence or that the activity did not occur. Residents in the "total dependence" and "did not occur" categories were combined (2). Data on falls and fractures in the 6 months prior to the survey, emergency department (ED) visits in the 90 days prior to the survey, and pressure ulcers and medications at the time of the survey were recorded.

### *Statistical analysis*

Analyses were conducted with SURVEYMEANS, SURVEYFREQ and SURVEYLOGISTIC procedures in SAS. These account for the strata,

cluster and weight variables defining the NNHS sampling methodology and were used to generate results that are generalizable to U.S. NH residents aged  $\geq 65$  years.

## RESULTS

Of the 13,507 NH residents in the 2004 NNHS, 11,939, representing ~1.32 million residents were  $\geq 65$  years. Of these, 3.6% had diabetes as the primary admission diagnosis, 5.6% had diabetes as the primary diagnosis at the time of the survey, and 24.6% of residents, representing ~324,000 individuals, had diabetes as a primary admission and/or current diagnosis.

Diabetic NH residents were younger (mean age 81.7 years) than those without diabetes (84.9 years,  $p < .0001$ ). Among residents aged 65-74, 75-84 and 85+, diabetes prevalence was 36.1%, 29.5% and 18.3%, respectively ( $p < .0001$ ). Diabetes was present in 35.2%-37.5% of non-White residents, compared to 22.5% among Whites. Relative to Whites, non-White residents had about twice the odds of diabetes.

Nearly 35% of diabetic residents were admitted with circulatory problems, compared to 27.3% of non-diabetic residents ( $p < .0001$ ). Diabetic residents had lower LOS (763 days vs 841 days,  $p < .01$ ) and the proportion of diabetic residents with LOS  $\leq 100$  days was slightly higher (22.6% vs 20.1%,  $p < .05$ ) than non-diabetic residents. Diabetic residents used more medications (10.3) than non-diabetic residents (8.4,  $p < .0001$ ).

Diabetic residents were admitted more frequently from acute care hospitals (42.5% vs 35.3%,  $p < .0001$ ). At admission, diabetic residents were less likely to pay with private insurance (10.5% vs 12.4%,  $p = .03$ ) and out-of-pocket resources

(34.4% vs 40.6%,  $p < .0001$ ), and more likely to utilize Medicare (44.0% vs 39.6%,  $p < .001$ ) and Medicaid (35.7% vs 32.6%,  $p < .05$ ).

With the exception of transfers, total dependence in ADLs differed by only ~1% between diabetic and non-diabetic residents. In the 6 months prior to the survey, diabetic residents had slightly fewer falls and fractures (34.7% vs 37.5%,  $p = .03$ ). Ten percent and 7.4% of diabetic and non-diabetic residents had ED visits in the 90 days prior to the survey. Nearly 14% and 9.4% of diabetic and non-diabetic residents had a pressure ulcer at the time of the survey, yielding a 56% higher odds of ulcer among diabetic residents.

## **CONCLUSIONS**

In 2004, approximately 1 in 4 United States NH residents aged  $\geq 65$  years had diabetes, a figure representing ~324,000 individuals.

NCHS reports together with our data, suggest suggesting a steady increase in diabetes as a condition of primary focus in U.S. NH: In 1995, 1997, 1999 and 2004 (current data) the prevalence of diabetes as the primary current diagnosis in NH was: 4.4%, 4.6%, 5.0% and 5.6 % (3,4,5). Ethnic disparities in diabetes prevalence that are well-documented in the community (6) continue into the NH setting. The odds of diabetes were about two times higher in Black and Hispanic NH residents relative to Whites. To the extent that demographic shifts and population projections will apply to NH, it is likely that non-Whites, particularly persons of Hispanic origin, will become more highly represented in the NH population in the future (7).

Diabetic nursing home residents had a somewhat more “post-acute/rehabilitation” profile than non-diabetic residents. They were admitted

more often from acute care hospitals, were slightly more likely to have stays of  $\leq 100$  days at the time of the survey and paid for care with Medicare more often than non-diabetic residents.

Diabetic residents were younger than their non-diabetic counterparts and diabetes decreased as age increased. The decrease in diabetes with increasing age may reflect selective mortality associated with diabetes and/or early cardiovascular morbidity (8,9).

Our observation of fewer falls and fractures in diabetic NH residents is inconsistent with previous community-based research (10,11). Diabetes may play a less significant role in risk of falls and fractures in NH because residents are frailer and may share a more homogenous risk profile than elders in the community. However, diabetic NH residents had a 56% increased odds of having a pressure ulcer at the time of the survey and were also more likely to have had an ED visit in the past 90 days. It was therefore not surprising that diabetic residents used more medications, an observation that was noted previously in a study of nursing home admissions (12).

Clinical practice guidelines are available for persons with diabetes (13), older adults with diabetes (14), and diabetic individuals in LTC (15,16). Nevertheless, the evidence base supporting clinical decision-making for diabetes in NH is sparse, partly because of the difficulty of conducting clinical trials in this population. Given the expected increase in the number and complexity of NH residents with diabetes in the coming decades and the paucity of clinical research providing guidance for their care, future efforts should focus on filling the knowledge gap by first defining endpoints that are appropriate for diabetic persons in NH and then designing clinical trials around these outcomes.

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