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Prevalence of Incontinence Among Older Americans



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

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Summary: This report presents national estimates of incontinence prevalence in the United States using data source specific definitions of incontinence among persons aged 65 years and over by sociodemographic characteristics during 2007–2012. The prevalence of incontinence is evaluated for non-institutionalized persons, those living in residential care facilities, and home health and hospice care recipients.

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Objective

This report presents national estimates of incontinence prevalence in the United States using data source-specific definitions of incontinence among persons aged 65 and over by sociodemographic characteristics during 2007–2010.

Methods

Data are from the 2007–2010 National Health and Nutrition Examination Survey (NHANES), the 2010 National Survey of Residential Care Facilities (NSRCF), the 2007 National Home and Hospice Care Survey (NHHCS), and the 2009 Long Term Care Minimum Data Set (MDS). Findings are based on face-to-face interviews with 2,625 noninstitutionalized respondents (NHANES) and reports provided by designated facility or agency staff members for 6,856 residential care facility (RCF) residents (NSRCF), 3,226 current home health care patients (NHHCS), 3,918 hospice discharges (NHHCS), and 2,416,705 nursing home residents (MDS). Response rates for incontinence questions were 84% among noninstitutionalized persons (NHANES), 98% among RCF residents and home health and hospice care patients (NSRCF and NHHCS), and 99% for nursing home residents (MDS).

Results

This is the first report presenting national estimates on incontinence for subpopulations of older persons sampled in the Centers for Disease Control and Prevention's National Center for Health Statistics surveys and the Centers for Medicare & Medicaid Services' Long Term Care Minimum Data Set. Because a different definition of incontinence is used by each data collection system, it is not possible to make data comparisons between them or to summarize results across all surveys. Accordingly, only survey-specific results are presented. Including recent data from all of these data collection systems facilitates a multidimensional picture of incontinence, while underscoring the need for a standardized definition.

Keywords: bladder incontinence • incontinence of urine • bowel incontinence • incontinence of feces

Prevalence of Incontinence Among Older Americans

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Introduction

This report uses data from the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS) and the Centers for Medicare & Medicaid Services (CMS) to present national estimates of incontinence prevalence among persons aged 65 and over. The estimates are based on data collected for noninstitutionalized persons, residents of residential care facilities (RCFs), patients of home health and hospice care agencies, and nursing home residents. Data are presented by place of residence (noninstitutionalized persons, residential care facility residents, and nursing home residents) and by services received (recipients of home health or hospice care). This is the first report to present national estimates of incontinence for subpopulations of older persons sampled by NCHS surveys and the CMS Long Term Care Minimum Data Set. Because a different definition of incontinence is used by each data collection system, it is not possible to make data comparisons between surveys or to summarize results across all surveys.

In older persons, incontinence is associated with multiple interacting factors, including chronic conditions such as diabetes and stroke, cognitive impairment, and mobility impairment. Bladder incontinence may be caused by conditions such as age-related changes in the lower urinary tract, urinary tract infection, and conditions not directly related to the genitourinary system, such as diabetes, cancer, stroke, cognitive impairment, and mobility impairment (1–11). Risk factors for bowel

incontinence include chronic diarrhea, inadequate fiber and water intake and chronic constipation, diabetes, stroke, neurologic and psychiatric conditions, cognitive impairment, and mobility impairment (12–16). Use of certain medications and polypharmacy are also associated with incontinence (6,16,17).

Incontinence presents a significant financial burden to the individual and to society. In the United States, the cost of bladder incontinence among adults in 2000 was estimated at \$19.5 billion, with \$14.2 billion incurred by community residents and \$5.3 billion by institutional residents (18). A majority (50%–75%) of the costs are attributed to resources used for incontinence management or “routine care” such as absorbent pads, protection, and laundry (19). The 2010 average annual cost for fecal incontinence was estimated at \$4,110 per person for patients who had fecal incontinence for more than 1 year with at least monthly leakage of solid, liquid, or mucus stool: \$2,353 for direct medical and nonmedical expenses, and \$1,549 for indirect costs associated with productivity loss (20). Greater incontinence symptom severity was associated with higher annual direct costs.

Individuals who are incontinent may carry an emotional burden of shame and embarrassment in addition to the physical discomfort and disruption of their lives that occur with episodes of incontinence (21). Bladder and bowel incontinence significantly impact quality of life even after adjusting for comorbidities and demographic differences (12,22–26). This impact

increases with greater severity of incontinence. Research has found an association between incontinence and declining mental health (26) and increased risk of the onset of psychological distress (27) and depressive symptoms (28). Incontinence is a predictor of functional limitations (29) and is associated with an increase in falls, which may result in injuries and mobility impairment (30–32). Incontinence adds to the psychological and physical burden of caregivers (33–35) and can be a risk factor for nursing home placement, hospitalization, and death (36–39).

Incontinence refers to the involuntary loss of bladder or bowel control. In survey research, incontinence is operationally defined using many different measures, making comparisons across populations and settings difficult. For example, measures of incontinence may include frequency of loss of bladder control (e.g., daily, weekly, or monthly), magnitude (e.g., drops or splashes), and type of loss of bowel control (e.g., mucus, solid stool, or liquid stool). Urinary incontinence may also be categorized by activity when the incontinence occurs (e.g., stress or urge incontinence).

Methods

Data Sources and Subpopulations

The estimates in this report are based on data for persons aged 65 and over. Data for the civilian noninstitutionalized population are from the National Health and Nutrition Examination Survey (NHANES); data for residents of RCFs are from the National Survey of Residential Care Facilities (NSRCF); data for home health care patients and hospice discharges are from the National Home and Hospice Care Survey (NHHCS); and data for nursing home residents are from the Long Term Care Minimum Data Set (MDS).

The sampling frames for NHANES, NSRCF, and NHHCS were constructed

differently. For the civilian noninstitutionalized population (NHANES), the sample was chosen from selected counties, blocks, households, and individuals within the household. In contrast, the sampling frame for residents of RCFs and home health and hospice patients was based on the provider and then a sample of residents and patients from the provider. The MDS contains detailed information about health status for all residents in Medicare- or Medicaid-certified nursing facilities.

While the residence status of the noninstitutionalized population (sampled by NHANES) and the nursing home population (MDS) is mutually exclusive, the residents of some RCFs may be included in the NHANES sampling frame. Home health and hospice care patients are defined by the services they receive from the respective agency and may reside in the community, RCFs, nursing homes, or hospitals.

The age groups presented in this report differ across the surveys because of the difference in the age composition within the populations sampled and the higher percentage of persons aged 85 and over among RCF and nursing home residents and among home health and hospice care recipients compared with NHANES respondents. Unless otherwise noted, prevalence estimates are age-adjusted to the 2000 U.S. standard population using the age groups 65–74 and 75 and over (NHANES); and 65–74, 75–84, and 85 and over (NSRCF, NHHCS, and MDS).

Definitions

For the purposes of this report, unless otherwise specified, the general term “incontinence” refers to the presence of either bladder or bowel incontinence as defined for each data system. When bladder incontinence is mentioned, the person may be incontinent of bladder only, or of both bladder and bowel. Similarly, bowel incontinence may include incontinence of both bowel and bladder.

As noted, there is substantial variation among surveys in the measurement of bladder and bowel

incontinence (Table 1). For example, NHANES collects self-reported information on different types and frequency of bowel incontinence episodes, while NHHCS asks if the patient has difficulty controlling his or her bowels. The reference period for incontinence varies from 7 days in NSRCF to 1 year in NHANES. Answers provided by facility or agency staff members may differ from answers that would be provided by the patient or resident him- or herself.

Presence of a urinary catheter or ostomy may not be related to incontinence and can be used to change urine and feces evacuation patterns for another reason (e.g., surgical removal of the large intestine). In this report, persons with a catheter or ostomy were considered continent. Data on ostomy and catheter use were not collected in NHANES, and were collected in NSRCF, NHHCS, and MDS in different ways. Therefore, NHANES estimates of incontinence are irrespective of the presence of a catheter or ostomy, while RCF and nursing home residents and home health and hospice care patients with ostomies or catheters, as they were defined in each data system, were not considered incontinent.

Such variations in data collection methods result in disparate definitions of incontinence and make cross-survey comparisons impossible. To underscore these differences, data are always discussed in this report with reference to the particular survey they were derived from or to the definition of incontinence in the survey, e.g., “difficulty controlling bladder” for estimates derived from NHHCS.

Error Measures and Statistical Testing

Estimates with relative standard errors (RSEs) of 30% or more or based on fewer than 30 unweighted records are considered unreliable and are not shown. Estimates based on 30 or more but less than 59 unweighted records and with an RSE less than 30% are considered of low reliability and are shown with a preceding dagger.

Standard errors for the 100% MDS sample are negligible and are not shown.

Trends and differences between survey estimates were tested for statistical significance using two-tailed z and t tests with a level of significance of 0.05. Terms such as “higher than” and “lower than” indicate a statistically significant difference. Odds ratios with 95% confidence intervals (CIs) were used to indicate significant differences between estimates; 95% CIs that exclude the value 1.0 were considered statistically significant.

Noninstitutionalized Population: NHANES, 2007–2010

Data for the civilian noninstitutionalized population are based on face-to-face interviews with 2,625 NHANES respondents. NHANES is a nationally representative sample of civilian noninstitutionalized residents of the United States (<http://www.cdc.gov/nchs/nhanes.htm>). The survey is unique in that it combines interviews and physical examinations. The NHANES interview includes demographic, socioeconomic, dietary, and health-related questions. NHANES provides the only self-reported data presented. Multiple years of data (2007–2010) were combined to increase estimate reliability.

Bladder incontinence was defined using the bladder incontinence severity index (ISI), also known as the Sandvik scale (40). The ISI is based on two questions included in NHANES, “How often do you have urinary leakage?” and “How much urine do you lose each time?” The ISI is the product of the frequency category of incontinence episodes multiplied by the category of the amount of urine lost per episode. Categories for frequency in NHANES (with the numerical value used in scale calculation in parentheses) are: never (0); less than once a month (1); a few times a month (2); a few times a week (3); and every day and/or night (4). Categories for amount of urine lost (with the numerical value used in scale calculation in parentheses) are:

drops (1); small splashes (2); and more (3). The ISI is calculated as a frequency (five levels) multiplied by the amount of leakage (three levels). The resulting index values (ISI values 0–12) are further categorized into five levels of incontinence: none (ISI value 0), slight (ISI values 1 and 2), moderate (ISI values 3–6), severe (ISI values 8–9), and very severe (ISI value 12). Thus, a person with very severe bladder incontinence would have to have urinary leakage every day and/or night (frequency level 4) and more than drops or small splashes (amount level 3). Less severe levels of incontinence would be based on varying levels of frequency and amount. In this report, noninstitutionalized persons who answered “never” to the question about frequency of incontinence episodes were defined as continent of bladder; all others who answered the question were defined as incontinent of bladder (or bladder incontinent). This definition includes slight and more severe levels of incontinence (ISI values 1–12). Severity of incontinence is assessed using a mean value of ISI scores and percentages with mutually exclusive categories of slight, moderate, and severe or very severe levels of ISI. NHANES respondents with missing information on bladder incontinence were excluded from the calculations (15.4% in 2007–2010).

Bowel incontinence was defined using the questions, “How often during the past 30 days have you had any amount of accidental bowel leakage that consisted of gas? ...of mucus? ...of liquid stool? ...of solid stool?” Possible answers to each of these questions were: 2 or more times a day, once a day, 2 or more times a week, once a week, 1–3 times a month, or never. In this report, persons who answered “never” to the three questions about leakage of mucus, liquid stool, and solid stool, including those who reported accidental leakage of gas only, were defined as NHANES-continent of bowel; all others who answered the questions were defined as incontinent of bowel (or bowel incontinent). Severity of bowel incontinence was assessed by using a mean value of the fecal incontinence severity index (FISI). The FISI scale was developed by Rockwood et al. (41)

using subjects’ perception of symptom severity for each incontinence type (gas, mucus, liquid stool, or solid stool) by leakage frequency, and ranges from zero (total continence) to 61 (complete incontinence of solid stool on a daily basis). In addition, this report presents percentages by incontinence type (mucus, liquid, and solid stool). NHANES respondents with missing information on bowel incontinence were excluded from the calculations (16.8% in 2007–2010).

Persons who reported urinary leakage and/or accidental leakage of mucus, liquid stool, or solid stool are defined as incontinent of bladder or bowel (or incontinent). Those with missing information on either condition were excluded from the calculations (14.7% in 2007–2010).

Information on ostomy and catheter use was not available in NHANES. In the other surveys described in this report, persons with ostomies or catheters were considered continent, but this distinction is not possible with NHANES data. Therefore, the assessment of continence among noninstitutionalized persons is based solely on the description above.

Race and ethnicity in this report were recoded combining ethnicity (Hispanic or Latino or not) and race categories as reported by the NHANES respondent. Percentage of poverty level was calculated using the ratio of family income to poverty level. Marital status was recoded into two categories: married (married, living with the partner) and not married. Not married includes those who were never married, widowed, separated, or divorced. Level of education was recoded from NHANES data into three categories: no high school (8th grade or less, or grades 9 to 11 and 12th grade with no diploma); high school (high school graduate or general educational development [GED] high school equivalency diploma); and some college or more (combining some college or associate’s degree and college graduate degree or higher).

Residential Care Facility Residents: NSRCF, 2010

Data on residents of RCFs are based on the 2010 NSRCF. 2010 NSRCF data are nationally representative of state-regulated RCFs, such as assisted living communities, where residents receive housing and supportive services because they cannot live independently but generally do not require the skilled level of care provided by nursing homes (<http://www.cdc.gov/nchs/nsrcf.htm>) (42). Only facilities that were licensed, registered, certified, listed, or otherwise regulated by their state; served primarily an adult population; had at least one current resident; had four or more licensed, certified, or registered residential care beds; and provided room and board with at least two meals a day, around-the-clock on-site supervision, and help with personal care such as bathing and dressing, or health-related services such as medication management, were eligible to participate in NSRCF. Facilities that exclusively served the severely mentally ill, the intellectually or developmentally disabled, or both were ineligible.

Resident information is based on in-person interviews with facility staff members, who were asked to refer to the sampled residents' records to answer the survey questions. In the questionnaire, residents with ostomies, catheters, or other devices were skipped out of questions on continence. Presence of a device was assessed by the question, "Does the resident have an ostomy, an indwelling catheter, or similar device?" RCF residents who had devices (2.2%) were included as continent in the analyses. For residents without devices, the questions to assess continence were, "Has the resident had any episode of urinary incontinence during the last 7 days?" and "Has the resident had any episode of bowel incontinence during the last 7 days?" A "yes" response was used to categorize the resident as incontinent of bladder or bowel, respectively. Residents with unknown device or incontinence status were excluded from the calculations (less than 1%).

Race and level of education are presented using the same categories as reported by the RCF representatives with no recoding. Marital status was recoded into two categories: married (currently married) and not married. Not married includes those who were never married, widowed, legally separated, or divorced.

Home Health and Hospice Care Patients: NHHCS, 2007

The NHHCS collected data on home health care patients and hospice discharges who received care from nationally representative samples of home health and/or hospice care agencies either certified by Medicare or Medicaid or licensed by a state to provide home health or hospice care services (<http://www.cdc.gov/nchs/nhhcs.htm>). Agencies that provided only homemaker services or housekeeping services, assistance with instrumental activities of daily living, or durable medical equipment and supplies were excluded from the survey.

Data on current home health patients and hospice discharges were collected through in-person interviews with agency directors and their designated staff members; no interviews were conducted directly with patients or their families or friends.

In the NHHCS questionnaire, patients and discharges with ostomies, catheters, or other devices were not eligible for questions on continence. Presence of a device was assessed by the questions, "Does/Did the patient have a urinary catheter?" and "Does/Did a patient have a colostomy or ileostomy for bowel elimination?" Among home health care patients, 9.1% used a urinary catheter (13.2% of men and 7.1% of women) and 3.0% had a colostomy or ileostomy. Among hospice discharges, 38.8% used a urinary catheter (37.5% of men and 40.5% of women) and 2.8% had a colostomy or ileostomy during their hospice stay. For home health care patients and hospice discharges without devices, the questions to assess continence were,

"Does/Did the patient have difficulty controlling his/her bladder?" and "Does/Did the patient have difficulty controlling his/her bowels?" Those with difficulty were defined as incontinent of bladder or bowel, respectively. Patients with unknown device or incontinence status were excluded from the calculations (fewer than 3%).

Home health and hospice care patients are defined by receipt of services rather than type of residence. Among patients receiving home health care, 90.8% received care at a private home or apartment, while 9.2% received care in an RCF or nursing home. Among hospice discharges at the end of hospice care, 51.2% of patients received care in a private home or apartment, 30.9% in an RCF or nursing home, and 17.9% in a residential hospice, hospital, or other facility.

Race is presented using the same categories as reported by the home health and hospice care agency's representative with no recoding. Marital status was recoded into two categories: married and not married. Not married includes those who were never married, widowed, separated, or divorced.

Nursing Home Residents: MDS, 2009

Data on nursing home residents are derived from the 2009 Long Term Care Minimum Data Set (MDS), Version 2.0. The MDS is a standardized, comprehensive screening and assessment tool of health status. It is collected for all residents of long-term care facilities certified to participate in Medicare or Medicaid by the Centers for Medicare & Medicaid Services. The MDS captures data on resident demographics, and on physical, psychological, and psychosocial functioning at admission and on a quarterly and annual basis. The information in the MDS is based on reports about the nursing home residents as assessed by staff members. MDS data for 2008 were used to determine length of stay and demographic characteristics for residents who were discharged in the first quarter of 2009.

In this report, estimates for nursing home residents are presented based on

the length of the nursing home episode. Short-term residents typically enter a nursing home following a hospital stay and need skilled nursing care or rehabilitation before being able to return to the community. Medicare either partially or entirely covers costs for up to 100 days of a beneficiary's posthospitalization stay in a skilled nursing facility. Long-term residents require chronic care for extended periods and typically do not return to the community, with nursing home costs generally covered by self-pay, private insurance, or Medicaid (43). For the purposes of this report, short-term residents are defined as residents with no annual MDS assessment and with an assessment at admission only, or one quarterly assessment only, or with a length of stay of 100 days or fewer. Long-term residents are defined as those with at least two quarterly MDS assessments, or an annual assessment, or with a length of stay of 101 days or more. The latest available assessment was used to derive incontinence estimates.

MDS questions used to assess bladder and bowel continence were based on functioning during the 14 days prior to assessment and the presence of an indwelling catheter or ostomy. Level of control of urinary bladder function, with appliances or continence programs if employed, was defined as follows: continent (complete control, includes use of an indwelling urinary catheter that does not leak urine); usually continent (incontinent episodes once a week or fewer); occasionally incontinent (incontinent episodes two or more times a week but not daily); frequently incontinent (tended to be incontinent daily, but some control present); or incontinent (multiple daily incontinent episodes). Level of control of bowel movement, with appliance or bowel continence programs if employed, includes the following: continent (complete control, includes use of an ostomy device that does not leak stool); usually continent (incontinent episodes less than weekly); occasionally incontinent (incontinent episodes once a week); frequently incontinent (incontinent episodes two to three times a week); or incontinent (incontinent

episodes all or almost all of the time). A separate MDS question asked about the presence of an indwelling catheter or ostomy.

For the purposes of this report, nursing home residents with an indwelling catheter (13.9% of short-term and 7.3% of long-term residents) or without an indwelling catheter and in complete control of urinary bladder function are defined as continent of bladder. Residents without an indwelling catheter and not in complete control of their bladder are defined as bladder incontinent. Residents with ostomy (2.8% of short-term and 2.5% of long-term residents) or without ostomy and in complete control of bowel movement are defined as continent of bowel. Those without ostomy and not in complete control are defined as incontinent of bowel. Those with unknown bladder or bowel MDS-continenence status were excluded from the calculations (less than 1%).

Sociodemographic variables were also derived from the MDS. Race and ethnicity in this report are presented using the same categories as in the MDS with no recoding. Marital status was recoded into two categories: married and not married. Not married includes those who were never married, widowed, separated, or divorced. Level of education was recoded from MDS data into three categories: no high school (no schooling, 8th grade or less, or grades 9 to 11); high school (high school); and some college or more (combining technical or trade school, some college, bachelor's degree, and graduate degree).

Results

Noninstitutionalized Population (NHANES)

Of noninstitutionalized persons aged 65 and over, 50.9% reported a urinary leakage and/or accidental bowel leakage of mucus, liquid stool, or solid stool; of them, 43.8% reported a urinary leakage, and 17.3% reported an accidental bowel leakage (Figure 1, Table 2). Among those who reported an

incontinence episode, the majority reported urinary but not accidental bowel leakage, while 10.6% of noninstitutionalized persons reported both urinary and bowel leakage (Figure 1).

More than one-half of noninstitutionalized women and more than one-quarter of noninstitutionalized men aged 65 and over reported a urinary leakage (Table 2). About 12% of women had severe or very severe ISI scores of bladder incontinence, while the rest of women and almost all of the men who reported urinary leakage had slight or moderate ISI scores (Tables 3 and 4). Restricting the definition of bladder incontinence to include only moderate, severe, and very severe levels of incontinence reduced the percentage with bladder incontinence among noninstitutionalized men and women from 43.8% to 24.0%. When only severe and very severe levels were considered, the percentage with bladder incontinence was 8.1% (Table 3).

Among non-Hispanic white women, the percentage with urinary leakage was 1.8 times (95% CI 1.4, 2.1) higher compared with non-Hispanic black women (58.3% compared with 33.4%) (Table 4). Observed differences in urinary leakage rates among noninstitutionalized persons by age group (Figure 2), poverty level, level of education, or marital status were not statistically significant (Table 2).

The average bladder ISI was 1.7 [standard error (SE) 0.1, ISI scale from 0 to 12]. The average ISI score was 2.5 times (95% CI 2.0, 3.0) higher among noninstitutionalized women compared with men, with average ISIs equal to 2.3 and 1.0, respectively (Table 4). Among noninstitutionalized women, non-Hispanic white and Mexican-American women had higher ISI scores than non-Hispanic black women. Persons aged 75 and over had higher ISI scores than those aged 65–74; and unmarried persons had higher ISI scores than married persons.

Observed differences in accidental bowel leakage rates by sex, age, race and Hispanic origin, poverty level, education, and marital status were not statistically significant (Figure 2, Table 2). Among those with accidental

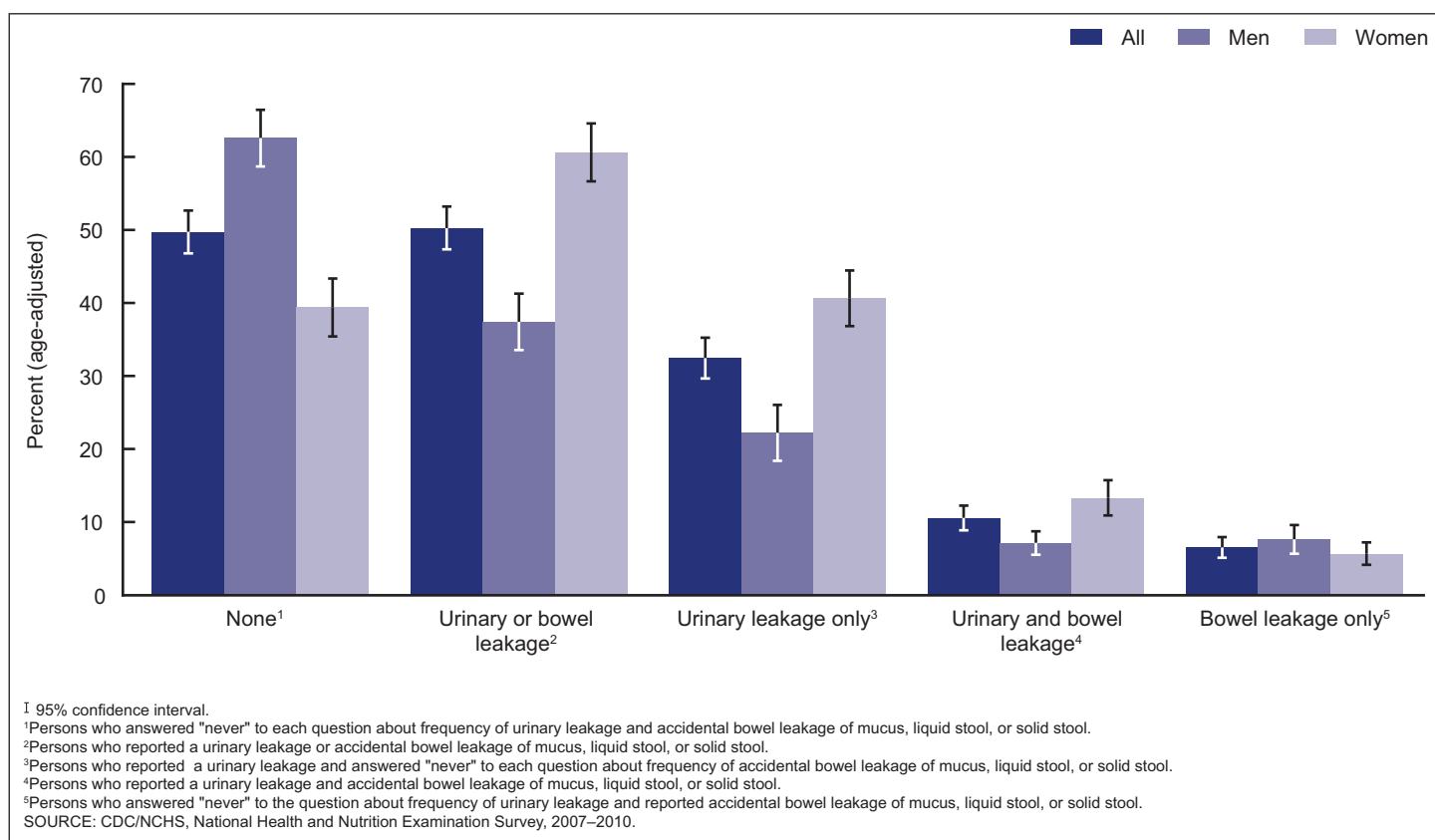


Figure 1. Age-adjusted incontinence among noninstitutionalized persons aged 65 and over, by type of incontinence and sex: National Health and Nutrition Examination Survey, 2007–2010

bowel leakage, 29.3% reported accidental leakage of mucus, 76.0% had had accidental leakage of liquid stool,

and 29.2% had had accidental leakage of solid stool, with 29.5% reporting two or three of these types of accidental

bowel leakage (data not shown). In addition, 74.9% of those with accidental bowel leakage of mucus, liquid stool, or solid stool reported accidental leakage of gas (data not shown).

The average FISI value was 5.98 (SE 0.21, FISI scale from 0 to 61). Among non-Hispanic white noninstitutionalized persons, the average FISI value was 6.2 (SE 0.2), 1.4 times (95% CI 1.2, 1.7) higher compared with the average FISI value among non-Hispanic black persons (4.3, SE 0.4), while observed differences in average FISI scores by other selected characteristics were not statistically significant (data not shown).

Residential Care Facility Residents (NSRCF)

Among RCF residents, 39.0% had had an episode of urinary and/or bowel incontinence during the 7 days prior to the survey, with 36.6% reported to have had an episode of urinary incontinence and 20.4% reported to have had an episode of bowel incontinence (Figure 3,

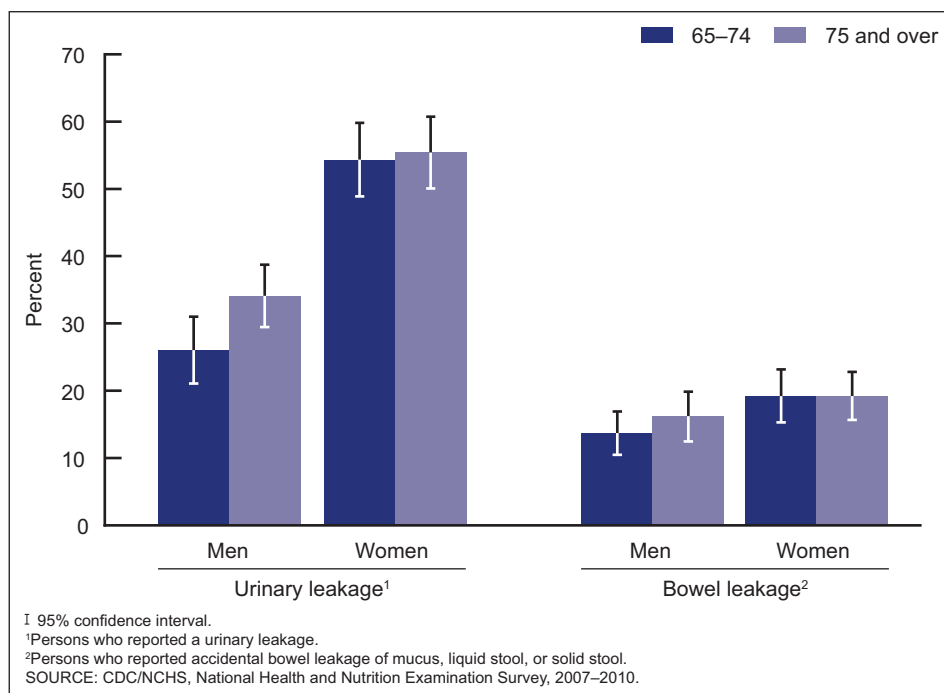


Figure 2. Incontinence among noninstitutionalized persons aged 65 and over, by age and sex: National Health and Nutrition Examination Survey, 2007–2010

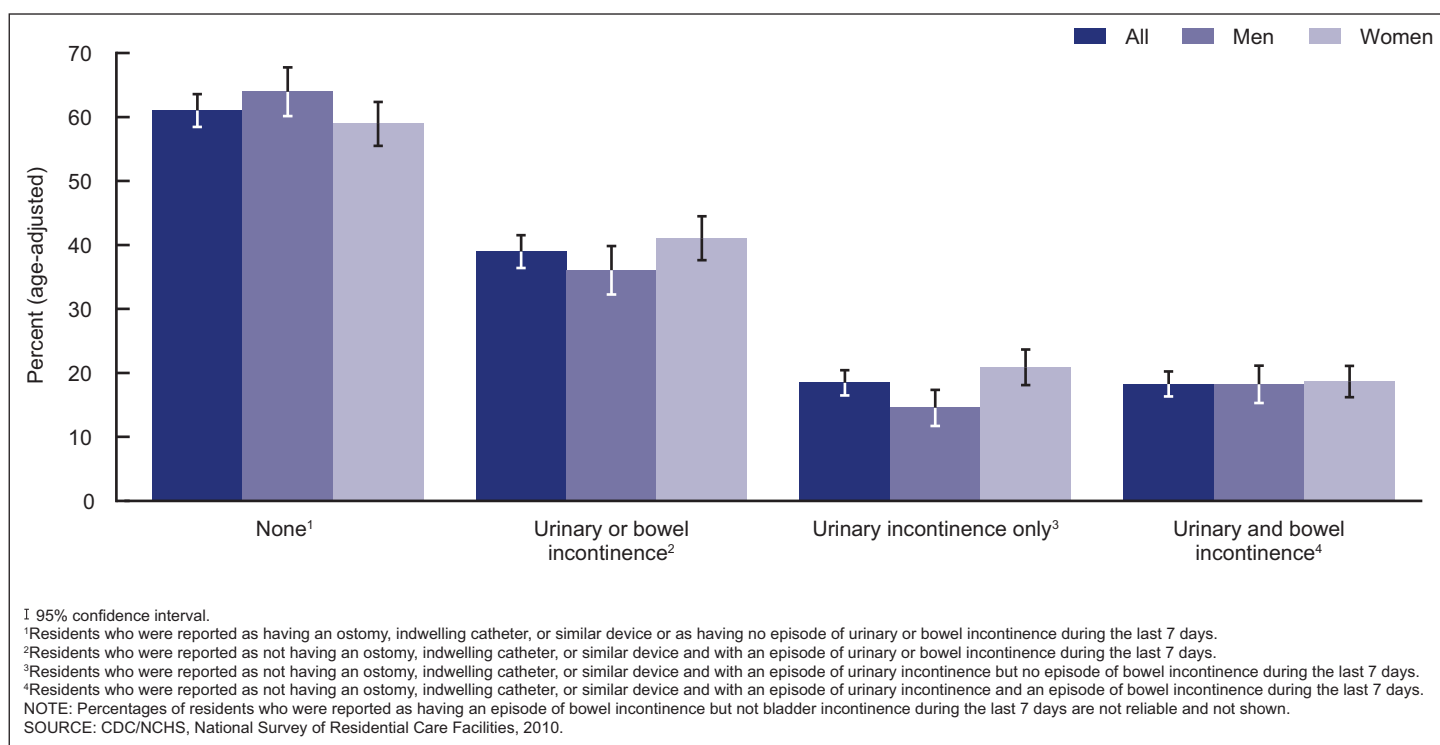


Figure 3. Age-adjusted incontinence among residential care facility residents aged 65 and over, by type of incontinence and sex: National Survey of Residential Care Facilities, 2010

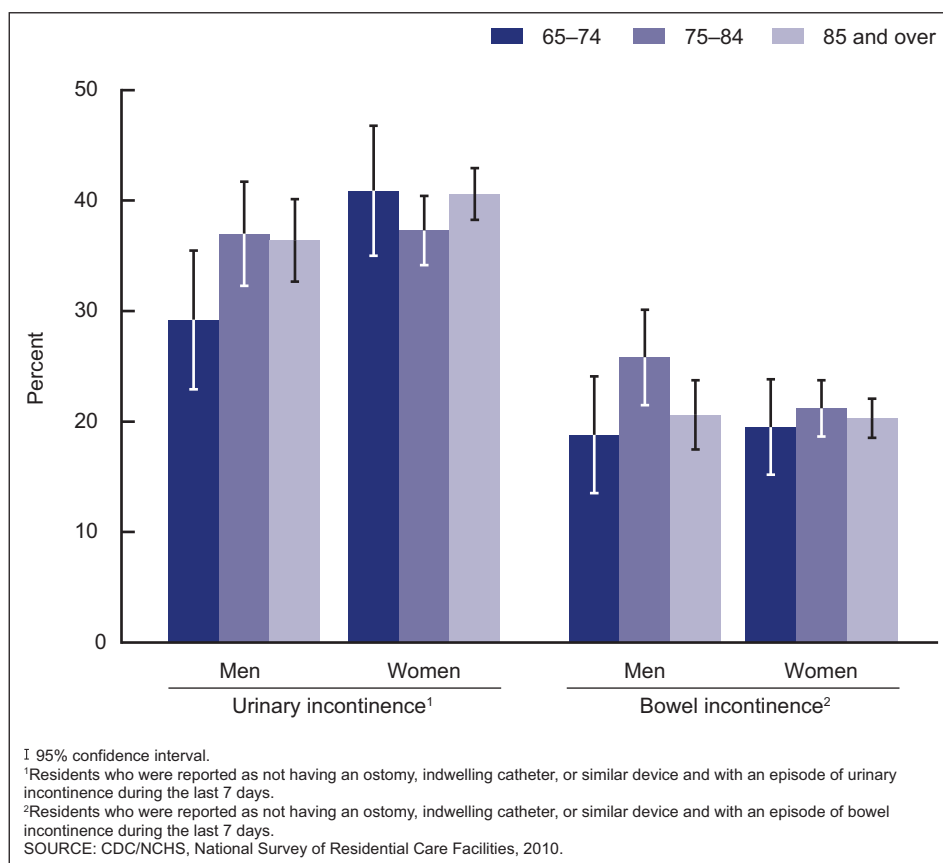


Figure 4. Incontinence among residential care facility residents aged 65 and over, by age and sex: National Survey of Residential Care Facilities, 2010

Table 5). About one-half of RCF residents who had had an incontinence episode were incontinent of bladder but not of bowel and about another one-half were incontinent of both bowel and bladder (Figure 3).

Women were 1.2 times more likely than men (95% CI 1.03, 1.4; 39.4% compared with 32.7%) to report a urinary incontinence episode, while there was no significant difference by sex in bowel incontinence (Figure 4, Table 5). Compared with unmarried residents, those who were married or living with a partner were 1.4 times (95% CI 1.2, 1.7; 48.7% compared with 34.4%) more likely to have had an episode of urinary incontinence and about 2 times (95% CI 1.5, 2.4; 35.1% compared with 17.9%) more likely to have had an episode of bowel incontinence (Table 5). There were no significant differences in rates of incontinence by age, race, and education (Figures 3 and 4, Table 5).

Recipients of Home Health Care (NHHCS)

Irrespective of place of residence, 45.4% of recipients of home health care

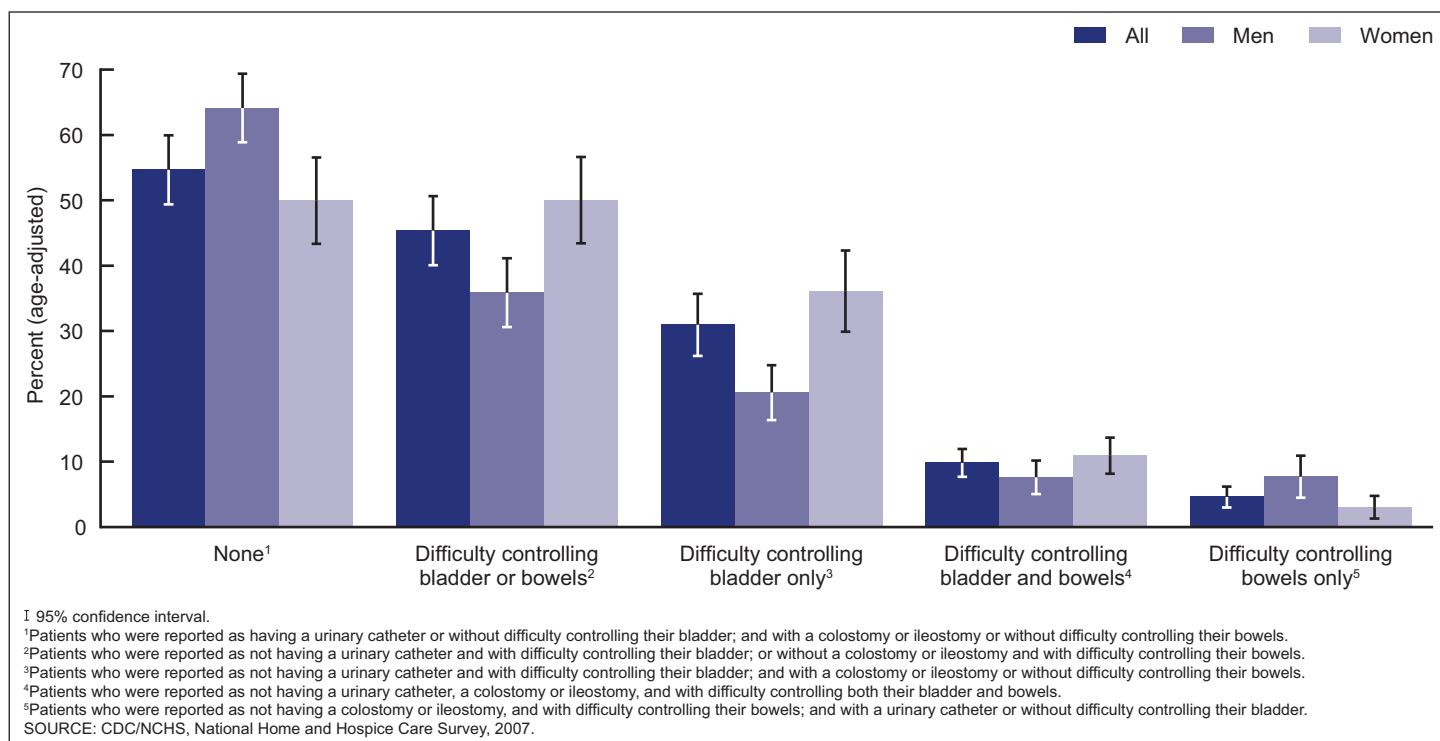


Figure 5. Age-adjusted incontinence among home health care patients aged 65 and over, by type of incontinence and sex: National Home and Hospice Care Survey, 2007

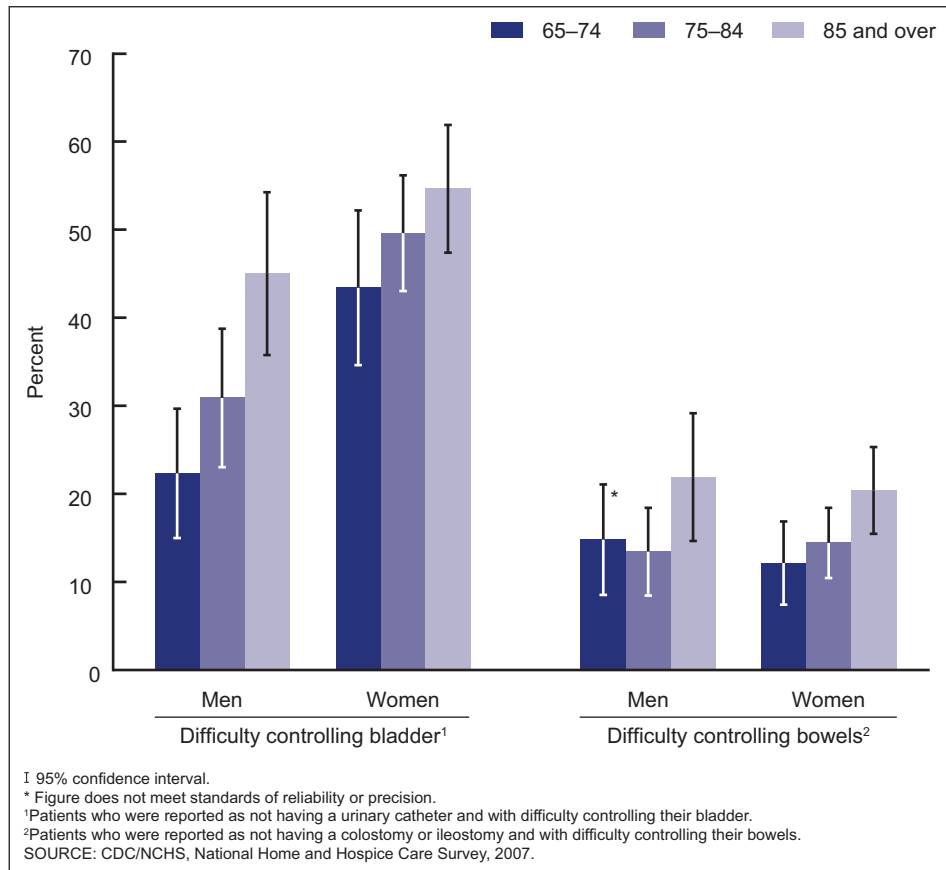


Figure 6. Incontinence among home health care patients aged 65 and over, by age and sex: National Home and Hospice Care Survey, 2007

were reported to have difficulty controlling their bladder and/or bowels; of them, 40.2% were reported to have difficulty controlling their bladder and 14.2% were reported to have difficulty controlling their bowels (Figure 5, Table 6). About one-third (30.8%) of incontinent home health care patients had difficulty controlling their bladder but not bowels, while 9.8% had difficulty controlling both bladder and bowels (Figure 5).

Female home health care patients were 1.7 times (95% CI 1.3, 2.1) more likely than male patients to have difficulty controlling their bladder (46.5% compared with 27.6%) (Figure 6, Table 6). The percentage of male patients with difficulty controlling their bladder doubled from 22.3% for the 65–74 age group to 45.0% for those 85 and over. Among female patients, the observed differences in the percentage of bladder incontinence by age were not significant (Figure 6, Table 6). There were no significant differences in difficulty controlling bladder by race and marital status (Table 6).

The percentage of recipients of home health care with difficulty controlling their bowels increased with

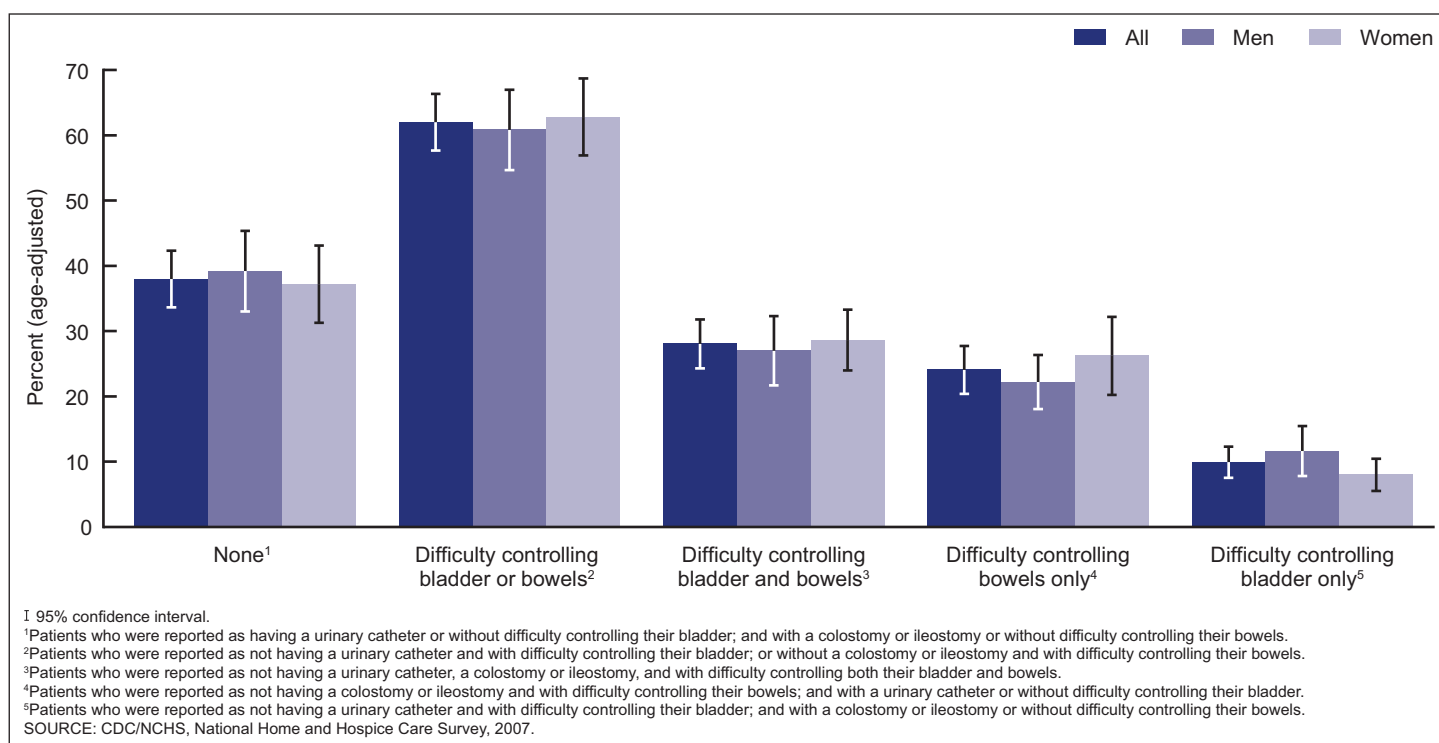


Figure 7. Age-adjusted incontinence among hospice care discharges aged 65 and over by type of incontinence and sex: National Home and Hospice Care Survey, 2007

age, from 13.1% for the 65–74 age group to 20.8% for those 85 and over (Table 6). There were no significant

differences in difficulty controlling bowels by sex, race, and marital status (Table 6).

Recipients of Hospice Care (NHHCS)

Among persons receiving hospice care, irrespective of place of residence, 62.1% were reported to have difficulty controlling their bladder and/or bowels (Figure 7, Table 7); of them, 36.0% were reported to have difficulty controlling their bladder, and 49.0% were reported to have difficulty controlling their bowels. About 10% (9.9%) of hospice patients had difficulty controlling their bladder but not their bowels, while 24.0% had difficulty controlling their bowels but not their bladder, and 28.0% had difficulty controlling both bladder and bowels (Figure 7). More than one-third of both male and female hospice patients (37.5% and 40.5%, respectively) were reported to have a urinary catheter (Figure 8), and 2.8% of hospice patients had a colostomy or ileostomy (data not shown). The lower percentage of hospice patients with difficulty controlling their bladder may be a result of the high proportion with urinary catheters.

The reported rate of difficulty controlling bladder among female hospice patients aged 85 and over was

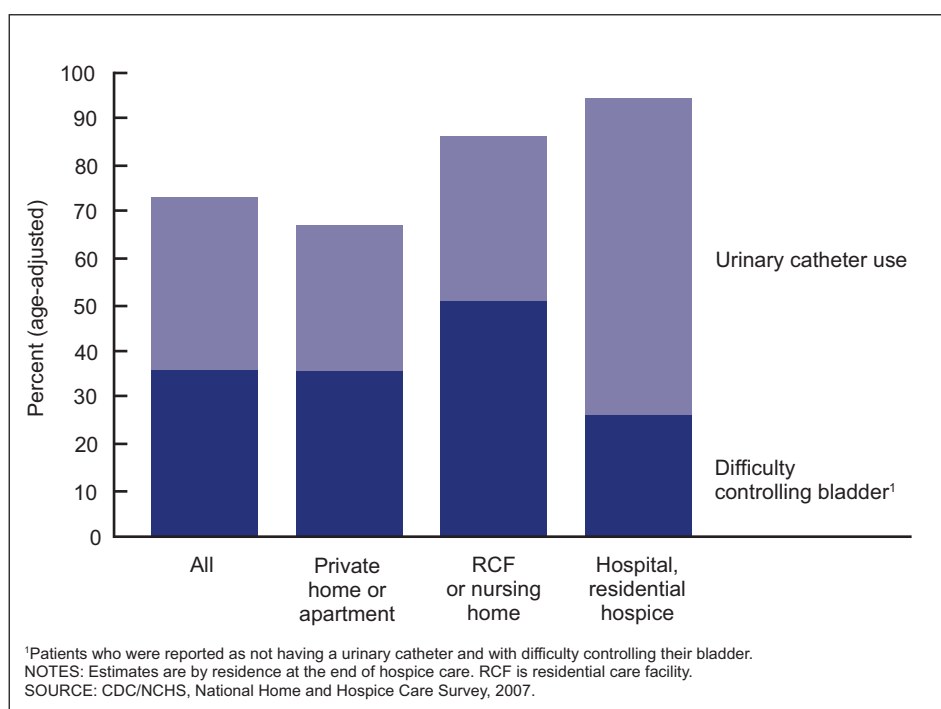


Figure 8. Age-adjusted incontinence of bladder or urinary catheter use among hospice discharges aged 65 and over, by residence: National Home and Hospice Care Survey, 2007

2 times higher (95% CI 1.5, 2.7) compared with the 65–74 age group (57.5% compared with 28.1%) (Figure 9, Table 7). There were no significant differences in the percentages with reported difficulty controlling their bladder by age group among male discharges, or among all discharges by race and marital status (Figure 9, Table 7).

The percentage with difficulty controlling their bowels among hospice care recipients aged 85 and over was higher than among those aged 65–74: 63.2% compared with 47.6%. Observed differences in difficulty controlling their bowels by age and race were not significant (Table 7).

Difficulty Controlling Bladder and Bowels Among Persons Receiving Home Health and Hospice Care by Type of Residence (NHHCS)

Persons receiving home health care in RCFs or nursing homes were 1.4 times (95% CI 1.1, 1.8; 58.0% compared with 40.0%) more likely to be reported as having difficulty controlling their bladder and 2.5 times (95% CI 1.4,

3.7; 32.7% compared with 12.9%) more likely to be reported as having difficulty controlling their bowels compared with those who received care in a private home or apartment (Table 8).

A similar pattern was seen for persons receiving hospice care. The percentage with difficulty controlling their bladder among persons receiving hospice care in an RCF or nursing home (50.9%) was higher compared with those who received care in a private home or apartment (35.8%) or in a residential hospice or hospital (26.4%) (Figure 8, Table 9). The lower percentage with difficulty controlling their bladder among hospice care recipients in residential hospices or hospitals may be explained by the higher percentage with a urinary catheter (68.1%), which is about 2 times higher than among those receiving care in a private home or apartment (31.4%) or an RCF or nursing home (35.4%) (Figure 8).

Patients receiving hospice care in a private home or apartment were less likely to be reported as having difficulty controlling their bowels (41.2%) compared with those receiving care in an RCF or a nursing home (66.3%) and residential hospice or hospitals (69.8%) (Table 9).

Nursing Home Residents (MDS)

Almost one-half (46.1%) of short-term nursing home residents and three-quarters (75.8%) of long-term nursing home residents were not in complete control of urinary bladder function or bowel movement during 14 days prior to the interview (Figure 10, Table 10). More than one-third (36.7%) of short-term residents and 70.3% of long-term residents were not in complete control of their bladder and one-third (33.1%) of short-term and 60.0% of long-term residents were not in complete control of their bowels. Almost one-quarter (23.6%) of short-term residents and more than one-half (54.4%) of long-term residents were not in complete control of both bladder and bowels (Figure 10).

The percentage of those who were not in complete control of urinary bladder function or bowel movement among nursing home residents aged 85 and over compared with those aged 65–74 was 1.5 times higher for short-term residents (60.3% compared with 40.2%) and 1.2 times higher for long-term residents (82.2% compared with 72.0%) (Table 10).

Among short-term nursing home residents, about the same percentage of men and women were not in complete control of urinary bladder function (36.5% and 36.7%, respectively), but a higher percentage of men were not in complete control of bowel movement compared with women (37.1% compared with 30.6%). Among long-term residents, a higher percentage of women were not in complete control of urinary bladder function compared with men (73.5% compared with 64.9%), while the percentages of men and women not in complete control of bowel movement were about the same (59.1% and 60.7%) (Table 10).

Non-Hispanic black residents had a higher prevalence of not being in complete control of urinary bladder function or bowel movement (66.7%) than non-Hispanic white or Hispanic residents (56.0% and 59.4%, respectively). This pattern was observed for both urinary bladder function and

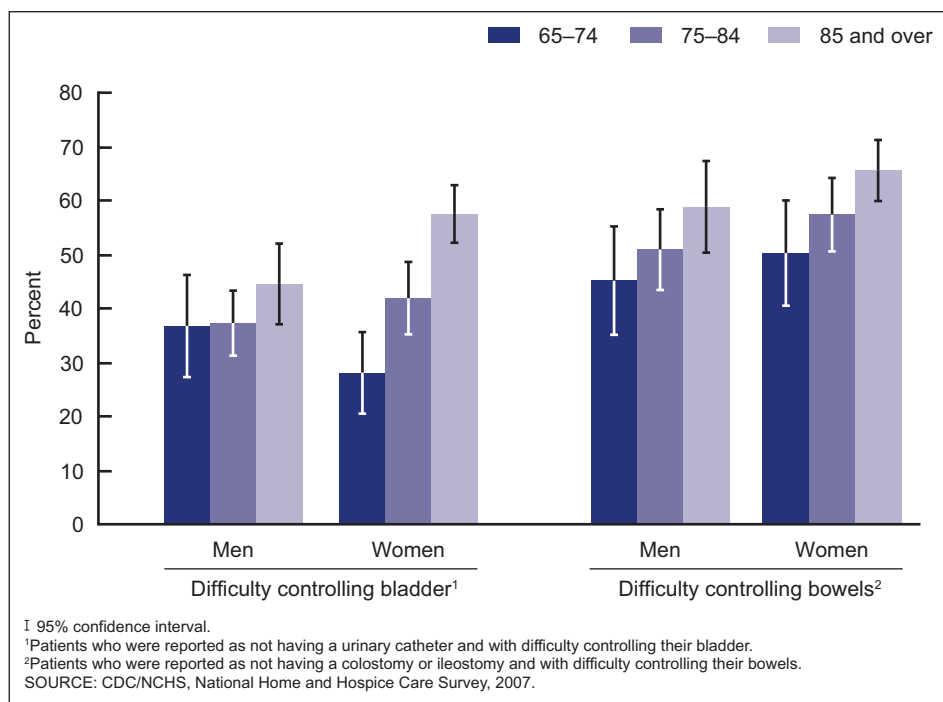


Figure 9. Incontinence among hospice discharges aged 65 and over, by age and sex: National Home and Hospice Care Survey, 2007

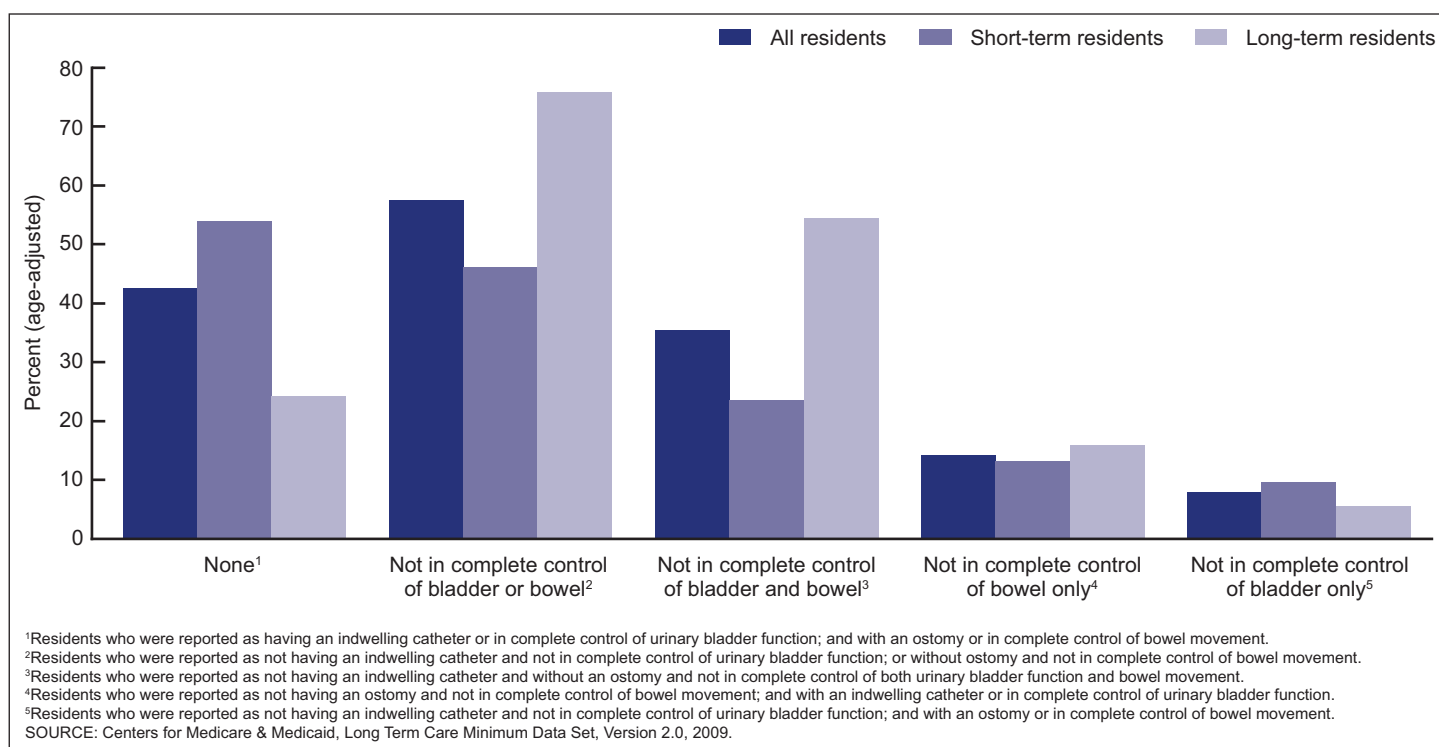


Figure 10. Age-adjusted incontinence among nursing home residents aged 65 and over, by type of incontinence and length of stay: Long Term Care Minimum Data Set, 2009

bowel movement, but the differences were more pronounced among short-term compared with long-term residents.

Among short-term residents, the prevalence of not being in complete control of urinary bladder function or bowel movement decreased with increasing levels of education, from 50.3% among residents with no high school diploma to 42.2% among residents with at least some college education. In contrast, the percentage of long-term residents not in complete control of urinary bladder function or bowel movement slightly increased with increasing levels of education, from 74.9% for those with no high school diploma to 78.3% for those with at least some college.

A greater percentage of married short-term and long-term residents were not in complete control of urinary bladder function or bowel movement compared with unmarried residents (47.1% compared with 44.7% of short-term residents, and 82.2% compared with 73.8% of long-term residents, respectively). This pattern held true for urinary bladder function

among long-term residents (75.0% of married residents and 68.7% of unmarried residents) but not among short-term residents (36.2% of married residents and 36.0% of unmarried residents). The prevalence of not being in complete control of bowel movement among married residents was higher compared with unmarried residents among both short-term (34.7% compared with 31.0%) and long-term residents (69.0% compared with 57.0%) (Table 10).

Discussion

Bladder and bowel incontinence are conditions affecting older persons that can have serious implications for quality of life, caregiving, and service delivery. To date, little attention has been given to summarizing incontinence data across multiple national data sources. This report presents comprehensive and detailed data on the prevalence of incontinence from four large national data systems: NHANES, NSRCF, NHHCS, and MDS. These are rich data

sources containing numerous indicators of health status, functional status, and other variables that can be used to examine the association of incontinence with other health conditions of older persons. Generally, the incontinence definitions in each data system reflect the needs of each residential or care setting, e.g., severity of incontinence among the noninstitutionalized population, hospice caregiver burden, or nursing home quality assessment. However, as this report demonstrates, the lack of standardized operational definitions for bladder and bowel incontinence makes it difficult to compare results.

Study Limitations

The difference in the years of data collection and lack of consistency in the definition of incontinence across the four data sources used for this report affect the comparability of the results. The data from the provider-based data surveys (NSRCF, NHHCS, MDS) were supplied by facility or agency staff

members, while the data from NHANES were based on self-report. In addition, NHANES does not collect data on the presence of an ostomy or catheter, while NSRCF does not distinguish between persons with ostomies and urinary catheters. If a person had such a device, NSRCF did not ask the question on incontinence. As a result, if a person with a colostomy was bladder incontinent, he or she was defined as continent. However, this definition should not affect the results significantly because only 2.2% of RCF residents were reported as having a device. Different designs and approaches to incontinence in the data systems did not allow harmonization of the incontinence definition and direct comparison of incontinence rates across residential settings.

Because home health and hospice care agencies may provide services in any residential setting and the residents of small RCFs may be included in the scope of the population sampled by NHANES, the results from these surveys in this report are not mutually exclusive.

Although NHANES provides data on the severity of incontinence, these data were not available from other data sources.

Records with missing incontinence status were excluded from the analysis. The extent of data missing varies across the data systems and was less than 1% in NSRCF and MDS, less than 3% in NHHCS, and about 15% in NHANES.

Some residential care facilities either do not admit persons with incontinence or will discharge residents after they become incontinent. These policies may affect the results. Estimates of the percentages of incontinent RCF residents were calculated including facilities that do not admit persons with bladder or bowel incontinence (10% and 20% of sampled facilities, respectively; data not shown) and those that discharge persons after they become bladder or bowel incontinent (5% and 13% of sampled facilities, respectively; data not shown).

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Table 1. Continence and incontinence definitions by data source

Data source	Year(s)	Population	Bladder incontinence		Bowel incontinence	
			Continent	Incontinent	Continent	Incontinent
National Health and Nutrition Examination Survey	2007–2010	Noninstitutionalized persons	Person who answered “never” to the question about frequency of urinary leakage.	Person who answered “less than once a month,” “a few times a month,” “a few times a week,” or “every day and/or night” to the question about frequency of urinary leakage.	Person who answered “never” to questions about frequency of accidental leakage of mucus, liquid stool, or solid stool.	Person who answered “2 or more times a day,” “once a day,” “2 or more times a week,” “once a week,” or “1–3 times a month” to questions about frequency of accidental leakage of mucus, liquid stool, or solid stool.
National Survey of Residential Care Facilities	2010	Residents of residential care facilities	Resident reported as having an ostomy, an indwelling catheter, or similar device or with no episode of urinary incontinence during 7 days prior to the interview.	Resident reported as not having an ostomy, an indwelling catheter, or similar device and with an episode of urinary incontinence during 7 days prior to the interview.	Resident reported as having an ostomy, an indwelling catheter, or similar device or with no episode of bowel incontinence during 7 days prior to the interview.	Resident reported as not having an ostomy, an indwelling catheter, or similar device and with an episode of bowel incontinence during 7 days prior to the interview.
National Home and Hospice Care Survey	2007	Home health and hospice care patients	Patient reported as having a urinary catheter or with no difficulty controlling his or her bladder.	Patient reported as not having a urinary catheter and with difficulty controlling his or her bladder.	Patient reported as having a colostomy or ileostomy for bowel elimination or with no difficulty controlling his or her bowels.	Patient reported as not having a colostomy or ileostomy for bowel elimination and with difficulty controlling his or her bowels.
Long Term Care Minimum Data Set	2009	Nursing home residents	Resident reported as having an indwelling catheter or in complete control of urinary bladder function during 14 days prior to the assessment.	Resident reported as not having an indwelling catheter and not in complete control of urinary bladder function during 14 days prior to the assessment.	Resident reported as having an ostomy or in complete control of bowel movement during 14 days prior to the assessment.	Resident reported as not having an ostomy and not in complete control of bowel movement during 14 days prior to the assessment.

Table 2. Incontinence among noninstitutionalized persons aged 65 and over, by selected characteristics: National Health and Nutrition Examination Survey, United States, 2007–2010

Characteristic	Number of persons ¹ (thousands)				Urinary leakage or accidental bowel leakage of mucus, liquid stool, or solid stool ²						Urinary leakage ³						Accidental bowel leakage of mucus, liquid stool, or solid stool ⁴					
	Men		Women		Total		Men		Women		Total		Men		Women		Total		Men		Women	
	Number	Standard error	Number	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
65 and over, age- adjusted ^{5,6}	...	...	...	...	50.9	1.5	38.0	1.9	61.2	2.0	43.8	1.7	29.9	2.0	54.8	2.1	17.3	1.1	14.9	1.3	19.2	1.4
65 and over, crude ⁶	16,076	...	21,230	...	50.6	1.5	37.5	2.0	61.2	2.0	43.5	1.7	29.4	2.1	54.8	2.1	17.2	1.1	14.7	1.3	19.2	1.5
Age group																						
65–74	9,218	...	10,768	...	48.4	2.0	34.1	2.4	60.6	2.6	41.4	2.0	26.0	2.4	54.3	2.7	16.7	1.4	13.7	1.6	19.2	1.9
75 and over	6,859	...	10,462	...	53.6	1.7	42.4	2.1	61.9	2.3	46.4	1.8	34.1	2.3	55.4	2.6	17.9	1.3	16.2	1.8	19.2	1.8
Race and ethnicity ⁵																						
Non-Hispanic white	12,991	...	16,838	...	53.0	1.6	39.6	2.2	63.6	2.2	46.0	1.8	30.6	2.3	58.3	2.2	17.8	1.3	15.8	1.6	19.4	1.7
Non-Hispanic black	1,222	...	1,899	...	40.8	2.4	35.1	4.5	44.5	3.2	32.2	2.2	†30.4	†4.3	33.4	3.5	†15.3	†1.6	*	*	†17.1	†2.4
Mexican-American	631	...	771	...	43.2	3.5	†26.4	†3.8	57.5	4.3	35.9	3.2	*	*	49.0	4.9	†16.4	†3.2	*	*	*	*
Percent of poverty level ^{5,7}																						
Less than 100%	1,211	127	2,138	200	40.9	3.6	†26.0	†4.3	50.6	4.0	33.2	3.5	*	*	43.0	4.0	†13.7	†2.2	*	*	*	*
100%–199%	3,608	209	6,144	261	50.7	2.0	38.0	3.0	58.6	2.7	43.9	1.9	28.9	2.7	53.3	3.0	18.1	2.1	†14.9	†2.7	20.0	2.4
200% or more	9,953	262	10,857	308	51.4	2.1	40.0	2.8	62.2	2.5	44.3	2.3	31.8	3.2	56.0	2.6	17.0	1.3	15.8	†1.7	18.2	1.8
Education ⁵																						
No high school diploma or GED	4,058	293	6,078	465	51.0	2.4	36.5	3.5	61.2	2.5	43.9	2.4	29.3	2.8	54.0	3.1	18.0	1.9	†11.6	†2.2	22.6	2.4
High school diploma or GED	3,907	240	6,157	268	49.2	2.2	35.4	3.2	58.2	3.2	43.7	2.3	27.9	3.1	54.2	3.3	14.2	1.2	†14.1	†1.5	†14.2	†1.5
Some college or more	8,114	410	8,993	437	51.9	1.8	39.9	2.4	63.3	2.8	43.8	1.9	30.9	2.7	56.0	2.6	18.7	1.8	16.8	2.0	20.6	2.7
Marital status ⁵																						
Married or living with partner	12,242	215	9,995	365	49.0	1.9	37.2	2.1	64.0	2.6	42.1	1.9	29.9	2.2	58.1	2.4	16.9	1.4	14.3	1.3	20.1	2.1
Not married	3,834	215	11,235	365	53.5	1.9	41.1	2.6	58.0	2.3	46.3	2.1	30.3	3.2	52.0	2.4	17.5	1.8	†16.8	†2.6	17.7	2.2

... Category not applicable.

† Estimate of low reliability (sample size between 30 and 59).

* Figure does not meet standards of reliability or precision.

¹Civilian noninstitutionalized U.S. population aged 65 and over. The population estimates by sex, age, and race and ethnicity are calculated by combining populations for NHANES 2007–2008 and NHANES 2009–2010. The population estimates by poverty level, education, and marital status categories are calculated by multiplying the weighted percentage of NHANES 2007–2010 participants in the category by the population.

²Defined as a leakage of urine or accidental bowel leakage that consisted of mucus, liquid stool, or solid stool.

³Defined as a leakage of urine. Respondents were asked, “How often do you have urinary leakage?” Those who answered “never” are defined as continent. Persons with unknown bladder incontinence status are excluded (15.4% in 2007–2010).

⁴Defined as an accidental bowel leakage that consisted of mucus, liquid stool, or solid stool. Respondents were asked, “How often during the past 30 days have you had any amount of accidental bowel leakage that consisted of mucus? ...of liquid stool? ...of solid stool?” Those who answered “never” to all three questions are defined as continent. Persons with unknown bowel incontinence status are excluded (16.8% in 2007–2010).

⁵Age-adjusted to the 2000 standard population using two age groups: 65–74 and 75 and over.

⁶Includes other racial and ethnic groups not shown separately and missing or unknown responses for poverty level, education, and marital status.

⁷Based on family income and family size.

NOTE: GED is General Educational Development high school equivalency diploma.

SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey.

Table 3. Age-adjusted percentage with bladder incontinence among noninstitutionalized persons aged 65 and over, by severity level and sex: National Health and Nutrition Examination Survey, United States, 2007–2010

Severity of bladder incontinence ^{1,2}	Total		Men		Women	
	Percent ³	Standard error	Percent ³	Standard error	Percent ³	Standard error
Slight, moderate, severe, very severe ⁴ . . .	43.8	1.7	29.9	2.0	54.8	2.1
Moderate, severe, very severe ⁵	24.0	1.5	13.2	1.1	32.5	2.0
Severe, very severe ⁶	8.1	0.8	†3.1	†0.5	11.9	1.4

† Estimate of low reliability (sample size between 30 and 59).

¹Defined as a leakage of urine. Respondents were asked, "How often do you have urinary leakage?" Those who answered "never" are defined as continent. Persons with unknown bladder incontinence status are excluded (15.4% in 2007–2010).

²Assessed by incontinence severity index (ISI, Sandvik 1999) and categorized as mutually exclusive categories of slight (ISI values 1 and 2), moderate (ISI values 3–6), severe (ISI values 8–9), and very severe (ISI value 12).

³Age-adjusted to the 2000 standard population using two age groups: 65–74 and 75 and over.

⁴ISI values of 1–12.

⁵ISI values of 3–12.

⁶ISI values of 8–12.

SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey.

Table 4. Severity of bladder incontinence among noninstitutionalized persons aged 65 and over, by selected characteristics: National Health and Nutrition Examination Survey, United States, 2007–2010

Characteristic	Bladder incontinence ¹ severity score (ISI scale) ^{2,3}						Percentage with slight incontinence on ISI scale ⁴						Percentage with moderate incontinence on ISI scale ⁴						Percentage with severe or very severe incontinence on ISI scale ⁴					
	Total		Men		Women		Total		Men		Women		Total		Men		Women		Total		Men		Women	
	Mean	Standard error	Mean	Standard error	Mean	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
65 and over, age-adjusted ^{5,6}	1.7	0.1	1.0	0.1	2.3	0.1	19.8	1.0	16.7	1.3	22.3	1.7	15.9	1.2	10.1	1.0	20.7	1.7	8.1	0.8	†3.1	†0.5	11.9	1.4
65 and over, crude ⁶	1.7	0.1	0.9	0.1	2.3	0.1	19.9	1.0	16.5	1.3	22.5	1.8	15.9	1.2	9.9	1.0	20.7	1.8	7.7	0.9	†2.9	†0.5	11.6	1.4
Age group																								
65–74	1.4	0.1	0.7	0.1	2.0	0.1	20.8	1.4	15.5	1.7	25.3	2.5	16.0	1.8	9.2	1.4	21.8	2.7	4.6	0.6	*	*	†7.2	†1.1
75 and over	2.1	0.1	1.2	0.1	2.7	0.2	18.6	1.3	18.1	1.8	19.1	1.6	15.9	1.4	11.1	1.4	19.4	1.8	11.9	1.3	†2.9	†0.5	16.9	2.0
Race/ethnicity ⁵																								
Non-Hispanic white	1.8	0.1	0.9	0.1	2.4	0.2	21.2	1.2	17.5	1.4	24.2	2.1	16.7	1.4	10.0	1.3	21.9	1.9	8.2	1.0	*	*	12.2	1.6
Non-Hispanic black	1.3	0.1	1.1	0.3	1.5	0.2	†12.2	†1.2	*	*	†11.9	†1.8	†14.1	†1.7	*	*	*	*	*	*	*	*	*	*
Mexican-American	1.7	0.2	0.7	0.2	2.5	0.3	†12.5	†1.6	*	*	*	*	†14.5	†3.1	*	*	†21.4	†4.7	*	*	*	*	*	*
Percent of poverty level ^{5,7}																								
Less than 100%	1.7	0.1	0.6	0.1	2.4	0.2	†11.2	†2.3	*	*	*	*	†11.4	†2.7	*	*	*	*	†10.6	†1.5	*	*	†15.8	†2.6
100%–199%	1.8	0.1	0.9	0.1	2.4	0.2	18.4	1.9	†15.1	†2.6	20.4	3.0	16.9	1.6	†10.9	†1.8	20.7	2.5	8.7	1.0	*	*	†12.2	†1.8
200% or more	1.6	0.1	1.0	0.1	2.2	0.2	21.4	1.4	18.5	2.0	24.1	2.4	15.7	1.5	10.1	1.4	21.0	2.3	7.2	1.2	*	*	†10.9	†1.8
Education ⁵																								
No high school diploma or GED	2.0	0.2	1.0	0.1	2.7	0.2	14.7	1.3	14.3	1.9	14.8	1.9	19.8	1.9	†12.6	†2.2	24.7	2.4	9.4	1.1	*	*	14.5	1.6
High school diploma or GED	1.7	0.1	1.0	0.2	2.2	0.2	18.4	1.4	†15.2	†2.3	20.5	2.4	17.7	1.4	*	*	23.7	2.0	†7.6	†1.1	*	*	†10.0	†1.9
Some college or more	1.6	0.1	0.9	0.1	2.2	0.2	23.2	1.7	18.5	2.3	28.0	3.2	13.0	1.4	†9.4	†1.1	16.3	2.4	7.6	1.0	*	*	†11.7	†1.9
Marital status ⁵																								
Married or living with partner	1.5	0.1	1.0	0.1	2.2	0.2	20.2	1.1	16.4	1.4	24.9	2.0	15.9	1.6	10.4	1.2	23.1	2.7	5.9	0.7	*	*	†9.7	†1.7
Not married	2.0	0.1	1.0	0.1	2.4	0.2	19.2	1.8	†17.6	†2.3	20.0	2.4	16.5	1.5	†9.2	†1.6	19.1	1.9	10.6	1.2	*	*	13.0	1.5

† Estimate of low reliability (sample size between 30 and 59).

* Figure does not meet standards of reliability or precision.

¹Defined as a leakage of urine. Respondents were asked, “How often do you have urinary leakage?” Those who answered “never” are defined as continent. Persons with unknown bladder incontinence status are excluded (15.4% in 2007–2010).

²Severity of bladder incontinence assessed by incontinence severity index (ISI, Sandvik 1999).

³Persons who were defined as continent and incontinent are included in the calculation.

⁴Severity of bladder incontinence is categorized as mutually exclusive categories of slight (ISI values 1 and 2), moderate (ISI values 3–6), severe (ISI values 8–9), and very severe (ISI value 12).

⁵Age-adjusted to the 2000 standard population using two age groups: 65–74 and 75 and over.

⁶Includes other racial and ethnic groups not shown separately and missing or unknown responses for poverty level, education, and marital status.

⁷Based on family income and family size.

NOTE: GED is General Educational Development high school equivalency diploma.

SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey.

Table 5. Incontinence among persons aged 65 and over living in state-regulated residential care facilities, by selected characteristics: National Survey of Residential Care Facilities, United States, 2010

Characteristic	Number of residents ¹ (in thousands)				Urinary and/or bowel ² incontinence						Urinary ³ incontinence						Bowel ⁴ incontinence					
	Men		Women		Total		Men		Women		Total		Men		Women		Total		Men		Women	
	Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard	
	Number	error	Number	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error
65 and over, age-adjusted ^{5,6}	...	...	...	...	39.0	1.3	36.1	1.9	41.1	1.7	36.6	1.3	32.7	1.9	39.4	1.7	20.4	1.0	21.4	1.7	20.1	1.3
65 and over, crude ⁶	179.2	4.8	476.9	7.4	39.9	0.9	37.4	1.4	40.8	1.0	38.5	0.9	35.5	1.4	39.6	1.0	20.9	0.7	22.0	1.2	20.5	0.8
Age group																						
65–74	26.9	1.9	35.5	2.3	38.9	2.2	33.8	3.3	42.8	3.1	35.9	2.2	29.2	3.2	40.9	3.0	19.2	1.7	18.8	2.7	19.5	2.2
75–84	55.6	2.8	143.2	4.6	38.6	1.4	39.2	2.5	38.3	1.6	37.2	1.4	37.0	2.4	37.3	1.6	22.5	1.1	25.8	2.2	21.2	1.3
85 and over	96.7	3.7	298.2	6.3	40.7	1.1	37.4	1.9	41.7	1.2	39.5	1.1	36.4	1.9	40.6	1.2	20.4	0.8	20.6	1.6	20.3	0.9
Race ⁵																						
White	170.1	4.7	456.6	7.4	39.5	1.4	36.2	2.1	41.9	1.9	36.9	1.4	32.4	2.0	40.2	1.9	20.9	1.1	21.7	1.8	20.7	1.4
Black	6.4	0.9	12.2	1.4	33.2	4.4	†33.2	†6.3	†33.7	†5.8	32.4	4.4	†33.2	†6.3	†32.3	†5.8	†14.1	†2.6	*	*	*	*
Education ⁵																						
High school or less	74.1	3.2	241.5	6.2	40.4	1.8	38.6	2.9	41.4	2.4	38.2	1.8	34.8	2.8	40.1	2.4	22.1	1.5	21.1	2.4	22.9	1.9
Some college or more	79.8	3.6	157.5	5.4	40.1	2.2	36.9	3.3	42.6	3.0	38.1	2.2	34.4	3.2	41.1	3.0	18.9	1.6	22.4	2.6	16.7	1.8
Marital status ⁵																						
Married or living with partner	52.5	2.7	38.6	2.3	51.5	3.7	48.8	5.1	54.2	5.2	48.7	3.7	43.4	5.1	53.5	5.2	35.1	3.5	37.7	5.0	33.0	4.7
Not married	124.5	4.1	432.0	7.1	36.7	1.3	32.7	2.1	39.2	1.8	34.4	1.3	29.9	2.0	37.3	1.8	17.9	1.0	17.3	1.5	18.5	1.4

... Category not applicable.

† Estimate of low reliability.

* Figure does not meet standards of reliability or precision.

¹Weighted number of residential facility residents, including those with a catheter or ostomy (about 2.2%, standard error 0.4 among RCF residents). Residents with unknown bladder or bowel incontinence status are excluded (less than 1% in 2010).²Defined as at least one episode of urinary or bowel incontinence during the last 7 days and not using a catheter or having an ostomy.³Defined as at least one episode of urinary incontinence during the last 7 days and not using a catheter or having a urostomy.⁴Defined as at least one episode of bowel incontinence during the last 7 days and not having a colostomy or ileostomy.⁵Age-adjusted to the 2000 standard population using three age groups: 65–74, 75–84, and 85 and over.⁶Includes other racial groups not shown separately and missing or unknown responses for education and marital status.

NOTE: RCF is residential care facility.

SOURCE: CDC/NCHS, National Survey of Residential Care Facilities, 2010.

Table 6. Incontinence among home health care patients aged 65 and over, by selected characteristics: National Home and Hospice Care Survey, United States, 2007

Characteristic	Number of patients (in thousands) ¹				Difficulty controlling bladder and/or bowels ²						Difficulty controlling bladder ³						Difficulty controlling bowels ⁴					
	Men		Women		Total		Men		Women		Total		Men		Women		Total		Men		Women	
	Number	Standard error	Number	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
65 and over, age-adjusted ^{5,6}	...	...	...	...	45.4	2.7	35.9	2.7	50.1	3.4	40.2	2.6	27.6	2.5	46.5	3.3	14.2	1.2	15.0	2.0	13.8	1.6
65 and over, crude ⁶	317.3	21.2	686.1	41.6	48.8	2.5	39.3	2.7	53.1	3.0	44.3	2.5	32.4	2.7	49.8	3.0	16.0	1.3	16.2	1.8	15.9	1.5
Age group																						
65–74	90.3	9.9	170.8	15.6	41.9	3.5	32.2	4.1	47.0	4.6	36.2	3.3	22.3	3.8	43.4	4.5	13.1	1.8	†14.8	†3.2	12.2	2.4
75–84	138.9	12.6	285.7	21.7	46.4	3.0	35.9	4.1	51.5	3.4	43.6	2.9	30.9	4.0	49.6	3.4	14.1	1.7	13.4	2.5	14.4	2.0
85 and over	88.2	9.0	229.6	16.7	57.4	3.0	51.6	4.7	59.6	3.6	52.0	3.1	45.0	4.7	54.6	3.7	20.8	2.1	21.9	3.7	20.4	2.5
Race ⁵																						
White	261.9	18.6	565.2	36.9	46.6	3.0	36.3	3.1	51.6	3.7	41.2	2.8	27.2	2.8	48.2	3.6	15.0	1.5	15.7	2.3	14.8	1.8
Black	43.3	7.7	107.1	14.3	43.4	4.8	†38.6	†6.8	46.2	6.1	38.2	5.2	†32.6	†6.4	41.5	6.1	13.0	2.4	*	*	†12.1	†3.2
Marital status ⁵																						
Married or living with partner	184.1	15.8	154.0	12.8	40.4	3.2	34.5	3.5	46.9	4.5	34.1	2.9	26.3	3.1	42.7	4.2	14.7	1.9	15.1	2.6	14.2	2.4
Not married	96.8	9.4	430.4	29.6	49.9	3.5	35.9	4.3	53.4	4.1	45.1	3.6	27.4	4.2	49.6	4.1	14.4	1.7	†15.3	†3.4	14.1	2.0

... Category not applicable.

† Estimate of low reliability.

* Figure does not meet standards of reliability or precision.

¹Weighted number of home health care patients aged 65 and over, including those with a catheter or ostomy (15.7%, standard error 1.9 among men; 10%, standard error 1.7 among women). Patients with unknown bladder or bowel incontinence status are excluded (1.4% in 2007).

²Defined as having difficulty controlling bladder (and not using a catheter) or bowels (and not having a colostomy or ileostomy).

³Defined as having difficulty controlling bladder and not using a catheter.

⁴Defined as having difficulty controlling bowels and not having a colostomy or ileostomy.

⁵Age-adjusted to the 2000 standard population using three age groups: 65–74, 75–84, and 85 and over.

⁶Includes other racial groups not shown separately and missing or unknown responses for marital status.

SOURCE: CDC/NCHS, National Home and Hospice Care Survey, 2007.

Table 7. Incontinence during hospice stay among hospice discharges aged 65 years and over, by selected characteristics: National Home and Hospice Care Survey, United States, 2007

Characteristic	Number of patients (in thousands) ¹				Difficulty controlling bladder and/or bowels ²						Difficulty controlling bladder ³						Difficulty controlling bowels ⁴					
	Men		Women		Total		Men		Women		Total		Men		Women		Total		Men		Women	
	Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard	
	Number	error	Number	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error	Percent	error
65 and over, age-adjusted ^{5,6}	...	...	...	...	62.1	2.2	60.9	3.1	62.9	3.0	36.0	2.1	36.6	2.8	34.7	2.5	49.0	2.6	46.6	3.2	51.3	3.5
65 and over, crude ⁶	374.7	21.2	493.3	24.0	68.6	1.6	64.1	2.6	72.0	1.9	44.6	1.6	39.9	2.3	48.2	2.0	57.2	2.1	52.6	2.9	60.7	2.3
Age group																						
65–74	82.9	8.1	78.1	9.1	57.4	3.4	58.2	5.2	56.6	4.8	32.7	3.1	36.8	4.8	28.1	3.9	47.6	3.5	45.2	5.1	50.3	5.0
75–84	153.4	11.2	154.6	10.9	64.2	2.6	61.7	3.8	66.6	3.3	39.6	2.4	37.3	3.1	41.9	3.4	54.1	2.7	50.9	3.8	57.4	3.5
85 and over	138.4	12.2	260.6	17.1	76.1	2.0	70.0	3.9	79.4	2.3	53.0	2.3	44.6	3.8	57.5	2.7	63.2	2.6	58.8	4.3	65.6	2.9
Race ⁵																						
White	333.5	19.5	462.0	23.2	62.1	2.2	60.4	3.3	63.6	3.1	35.8	2.2	36.7	3.0	34.5	2.6	48.4	2.6	45.3	3.3	51.2	3.7
Black	34.6	6.8	22.9	5.1	63.2	7.3	62.2	9.4	59.7	10.6	37.8	7.4	†35.8	†9.5	36.5	9.8	58.1	7.1	56.4	8.9	57.5	10.5
Marital status ⁵																						
Married or living with partner.	241.1	16.7	98.6	8.1	60.5	3.0	59.0	3.6	63.9	4.8	34.5	2.5	35.1	3.2	33.4	3.9	49.2	3.1	47.5	3.6	52.6	5.1
Not married.	118.9	9.4	359.5	21.0	62.2	3.0	63.8	5.0	60.7	4.1	37.7	2.8	39.2	5.1	35.9	3.4	50.4	3.3	46.5	5.3	51.7	4.3

... Category not applicable.

† Estimate of low reliability.

¹Weighted number of hospice discharges aged 65 and over, including those with a catheter or ostomy (about 40% among men and women). Discharges with unknown bladder or bowel incontinence status are excluded (2.7% in 2007).²Defined as having difficulty controlling bladder (and not using a catheter) or bowels (and not having a colostomy or ileostomy).³Defined as having difficulty controlling bladder and not using a catheter.⁴Defined as having difficulty controlling bowels and not having a colostomy or ileostomy.⁵Age-adjusted to the 2000 standard population using three age groups: 65–74, 75–84, and 85 and over.⁶Includes other racial groups not shown separately and missing or unknown responses for marital status.

SOURCE: CDC/NCHS, National Home and Hospice Care Survey, 2007.

Table 8. Percentage with incontinence among home health care patients aged 65 and over, by residence: National Home and Hospice Care Survey, United States, 2007

Characteristic	Number of patients (in thousands) ¹				Difficulty controlling bladder and/or bowels ²				Difficulty controlling bladder ³				Difficulty controlling bowels ⁴			
	Private home or apartment		RCF or nursing home		Private home or apartment		RCF or nursing home		Private home or apartment		RCF or nursing home		Private home or apartment		RCF or nursing home	
	Number	Standard error	Number	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
65 and over, age-adjusted ⁵	...	...	...	...	44.5	2.8	63.1	6.7	40.0	2.7	58.0	6.5	12.9	1.1	32.7	7.1
65 and over, crude	905.1	49.1	91.7	10.7	47.5	2.6	63.9	5.1	43.5	2.6	55.3	5.4	14.0	1.1	36.3	5.2
Age group																
65–74	244.6	18.7	*	*	40.7	3.7	*	*	34.8	3.4	*	*	12.1	1.7	*	*
75–84	389.2	26.2	34.7	6.6	46.2	3.0	49.8	9.3	44.0	3.1	38.5	7.9	12.5	1.7	*	*
85 and over.	271.3	18.5	44.0	6.6	55.5	3.2	72.4	5.7	50.6	3.3	63.3	6.6	17.7	2.0	41.2	7.3
Sex ⁵																
Men	280.6	20.0	35.2	5.6	34.0	2.7	54.0	11.1	26.7	2.4	47.3	10.9	13.3	2.1	*	*
Women	624.5	40.6	56.5	7.5	49.4	3.5	71.5	6.6	46.4	3.5	67.7	6.4	12.7	1.4	36.1	10.8

... Category not applicable.

* Figure does not meet standards of reliability or precision.

¹Weighted number of home health care patients, including those with a catheter or ostomy (15.7%, standard error 1.9 among men; 10%, standard error 1.7 among women). Patients with unknown bladder or bowel incontinence status are excluded (1.4% in 2007).

²Defined as having difficulty controlling bladder (and not using a catheter) or bowels (and not having a colostomy or ileostomy).

³Defined as having difficulty controlling bladder and not using a catheter.

⁴Defined as having difficulty controlling bowels and not having a colostomy or ileostomy.

⁵Age-adjusted to the 2000 standard population using three age groups: 65–74, 75–84, and 85 and over.

NOTE: RCF is residential care facility.

SOURCE: CDC/NCHS, National Home and Hospice Care Survey, 2007.

Table 9. Percentage with incontinence among hospice patients aged 65 and over, by place of residence at the end of hospice care: National Home and Hospice Care Survey, United States, 2007

Characteristic	Number of patients (in thousands) ¹						Difficulty controlling bladder and/or bowels ²						Difficulty controlling bladder ³						Difficulty controlling bowels ⁴					
	Private home or apartment		RCF or nursing home		Hospital, residential hospice		Private home or apartment		RCF or nursing home		Hospital, residential hospice		Private home or apartment		RCF or nursing home		Hospital, residential hospice		Private home or apartment		RCF or nursing home		Hospital, residential hospice	
	Standard Number	error	Standard Number	error	Standard Number	error	Standard Percent	error	Standard Percent	error	Standard Percent	error	Standard Percent	error	Standard Percent	error	Standard Percent	error	Standard Percent	error	Standard Percent	error	Standard Percent	error
65 and over, age-adjusted ⁵	...	...	...	...	...	...	53.1	2.7	77.0	4.5	74.1	3.9	35.8	2.2	50.9	6.4	26.4	3.9	41.2	2.7	66.3	5.2	69.8	4.2
65 and over, crude	439.0	23.1	264.5	19.0	153.4	15.2	58.4	2.2	82.4	2.1	74.2	3.2	39.9	2.0	62.9	3.2	26.3	3.0	45.9	2.4	69.3	3.0	69.6	3.8
Age group																								
65–74.	100.3	9.6	20.1	4.2	32.1	5.3	48.7	4.4	71.7	8.0	76.1	6.0	32.6	3.6	43.6	10.8	25.9	6.1	37.7	4.3	61.1	8.7	70.5	6.3
75–84.	172.6	12.0	77.8	8.0	54.9	8.0	54.2	3.4	82.4	3.7	70.2	5.5	36.1	3.0	55.5	4.7	27.4	5.7	41.4	3.4	73.3	4.3	68.8	5.6
85 and over	166.1	13.3	166.6	14.1	66.3	7.6	68.5	3.1	83.6	2.4	76.6	4.9	48.1	3.5	68.8	3.4	25.7	4.9	55.4	3.4	68.5	3.6	69.9	5.3
Sex ⁵																								
Men	217.0	14.9	86.7	8.2	68.1	9.6	50.7	3.6	79.7	6.3	77.9	5.5	35.3	3.2	55.8	7.3	28.0	6.2	38.0	3.4	64.2	7.8	72.5	5.9
Women	222.0	14.3	177.8	15.2	85.3	9.1	55.4	3.7	73.3	7.3	70.3	5.3	35.8	3.2	44.3	7.2	24.8	4.5	44.7	3.9	67.7	7.6	66.9	5.5

... Category not applicable.

¹Weighted number of hospice discharges aged 65 and over, including those with a catheter or ostomy (about 40% among men and women). Discharges with unknown bladder or bowel incontinence status are excluded (2.7% in 2007).²Defined as having difficulty controlling bladder (and not using a catheter) or bowels (and not having a colostomy or ileostomy).³Defined as having difficulty controlling bladder and not using a catheter.⁴Defined as having difficulty controlling bowels and not having a colostomy or ileostomy.⁵Age-adjusted to the 2000 standard population using three age groups: 65–74, 75–84, and 85 and over.

NOTE: RCF is residential care facility.

SOURCE: CDC/NCHS, National Home and Hospice Care Survey, 2007.

Table 10. Incontinence among nursing home residents aged 65 and over, by selected characteristics: Long Term Care Minimum Data Set, United States, 2009

Characteristic	Number of residents ¹ (in thousands)		Residents not in complete control of urinary bladder function or bowel movement ²			Residents not in complete control of urinary bladder function ³			Residents not in complete control of bowel movement ⁴		
	Short-term ⁵	Long-term ⁶	All	Short-term ⁵	Long-term ⁶	All	Short-term ⁵	Long-term ⁶	All	Short-term ⁵	Long-term ⁶
				Percent			Percent			Percent	
65 and over, age-adjusted ^{7,8}	...	...	57.5	46.1	75.8	49.6	36.7	70.3	43.4	33.1	60.0
65 and over, crude ⁸	1,356.3	1,060.4	64.3	52.3	79.8	56.8	42.4	75.4	48.3	37.3	62.2
Age											
65–74	271.9	150.9	51.5	40.2	72.0	43.4	31.1	65.5	39.2	29.1	57.4
75–84	531.2	339.2	61.4	50.0	79.4	53.6	40.3	74.4	46.1	35.5	62.9
85 and over	553.2	570.3	71.4	60.3	82.2	64.4	49.9	78.5	53.3	43.2	63.2
Sex											
Men aged 65 and over ^{7,8}	472.7	282.6	57.1	48.1	72.3	47.0	36.5	64.9	45.2	37.1	59.1
65–74	112.6	68.2	52.0	42.3	68.1	42.6	31.7	60.6	41.7	33.0	56.0
75–84	194.6	106.6	61.0	52.4	76.6	50.5	40.2	69.2	48.2	40.1	62.9
85 and over	165.5	107.8	67.3	60.2	78.1	56.1	46.5	70.8	52.0	45.7	61.8
Women aged 65 and over ^{7,8}	883.3	777.8	57.6	44.9	78.1	50.8	36.7	73.5	42.1	30.6	60.7
65–74	159.3	82.7	51.2	38.7	75.2	44.0	30.7	69.6	37.3	26.3	58.5
75–84	336.5	232.6	61.7	48.6	80.6	55.2	40.3	76.7	45.1	32.8	62.8
85 and over	387.6	462.5	72.8	60.4	83.1	67.1	51.4	80.3	53.8	42.1	63.5
Race/ethnicity ⁷											
Non-Hispanic white	1,164.9	870.5	56.0	44.9	75.5	48.1	35.6	69.8	41.1	31.2	58.5
Non-Hispanic black	109.4	123.9	66.7	55.5	78.7	58.6	44.8	73.1	55.8	45.4	66.9
Hispanic	47.8	42.0	59.4	49.1	73.9	51.6	38.9	69.1	49.6	40.2	62.8
Education ⁷											
Unknown	63.3	440.5	76.5	64.5	72.4	70.7	54.0	73.2	62.0	53.0	63.4
No high school diploma	300.9	213.2	58.5	50.3	74.9	50.3	40.2	67.2	44.0	36.7	56.3
High school	588.5	266.0	53.2	45.3	75.4	44.7	35.8	68.9	39.0	32.1	58.1
Some college or more	403.5	140.7	49.4	42.2	78.3	41.0	33.2	68.8	35.8	29.4	59.1
Marital status ⁷											
Married	437.1	189.9	56.2	47.1	82.2	46.4	36.2	75.0	43.7	34.7	69.0
Not married	875.6	815.8	57.3	44.7	73.8	50.3	36.0	68.7	42.4	31.2	57.0

... Category not applicable.

¹Nursing home residents aged 65 and over, including those with a catheter or ostomy (17% among short-stay and 9.5% among long-stay residents). Persons with unknown bladder or bowel incontinence status are excluded (less than 1% in 2009).²Defined as having at least one incontinence episode in the past 14 days or ostomy leaking a stool or urostomy leaking urine. Estimates for bladder incontinence exclude those with an indwelling catheter but may include those with another type of catheter leaking urine.³Defined as having at least one bladder incontinence episode in the past 14 days and not having an indwelling catheter. Estimates for bladder incontinence may include persons with other types of catheters or a urostomy leaking urine.⁴Defined as having at least one bowel incontinence episode in the past 14 days, including an ostomy device leaking stool.⁵Residents with a length of stay of 100 days or fewer. The data are for those with admission or first quarterly review assessments only or with a length of stay of no more than 100 days.⁶Residents with a length of stay of more than 100 days. The data are for those with annual or quarterly review assessments after the first 100 days of the stay.⁷Age-adjusted to the 2000 standard population using age groups: 65–74, 75–84, and 85 and over.⁸Includes other racial and ethnic groups not shown separately and missing or unknown responses for education, and marital status.

SOURCE: Centers for Medicare & Medicaid, Long Term Care Minimum Data Set, Version 2.0.

Appendix. Technical Notes

The data sources used in this report are described briefly below.

National Health and Nutrition Examination Survey

Description: Designed to assess the health and nutritional status of the U.S. noninstitutionalized civilian population through direct physical examinations, laboratory tests, and interviews. The interview includes demographic, socioeconomic, dietary, and health-related questions. The examination component consists of medical, dental, and physiological measurements, as well as laboratory tests administered by highly trained medical personnel.

Source and contact information: Centers for Disease Control and Prevention, National Center for Health Statistics, <http://www.cdc.gov/nchs/nhanes.htm>.

National Survey of Residential Care Facilities

Description: Designed to produce a general database on residential care facilities, their residents, and staff members. It is a first-ever survey of residential care providers including assisted living residences; board and care homes; congregate care-enriched housing programs; homes for the aged; personal care homes; and shared housing establishments that are licensed, registered, listed, certified, or otherwise regulated by a state. Data are collected on facility characteristics, such as size, ownership, staffing, certification status, and services provided; and resident demographics, health and functional status, involvement in activities, services used, and charges.

In-person interviews were conducted with residential care administrators, caregivers, and staff members.

Source and contact information: Centers for Disease Control and Prevention, National Center for Health Statistics, <http://www.cdc.gov/nchs/nsrcf.htm>.

National Home and Hospice Care Survey

Description: Designed to provide descriptive information on home health and hospice care agencies, their staff members, their services, and their patients. Data are collected on demographic characteristics of home health care patients and hospice discharges, services received, length of time since admission, diagnoses, medications taken, advance directives, and other items.

Source and contact information: Centers for Disease Control and Prevention, National Center for Health Statistics, <http://www.cdc.gov/nchs/nhcs.htm>.

Long Term Care Minimum Data Set, Version 2.0

Description: Standardized, primary screening and assessment tool of health status for comprehensive assessment for all residents of long-term care facilities certified to participate in Medicare or Medicaid. The Minimum Data Set (MDS) contains data on resident demographics; and physical, psychological, and psychosocial functioning. The MDS plays a key role in the Medicare and Medicaid reimbursement system and in monitoring the quality of care provided to nursing facility residents.

Source and contact information: Centers for Medicare & Medicaid Services, <http://www.resdac.org/cms-data/files/mds-2.0>.

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