

APPENDIX

DATABASE AND VARIABLE DESCRIPTIONS

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Database

This report contains information about nursing home residents from the Minimum Data Set for Nursing Home Resident Assessment and Care Screening (MDS) used by all Medicare or Medicaid-certified nursing homes in the United States.

The full MDS is completed at admission and annually on all nursing home residents. In this effort we used only annual MDS assessments completed during the calendar year 2001. This choice, as noted earlier, emphasizes longer-stay nursing home residents. It de-emphasizes those residents who enter a nursing home for a short recuperative or rehabilitative stay.

Again, it is important to note that the columns of data in the tables that represent portions of an area that differ in their degree of rurality will not always total to the data presented for the entire area (i.e., nation, region, State). This phenomenon results from the inability of the research team to match the data for some residents to our categories of rurality (see RUCA CODES below).

Regions

The data are presented for the nation as a whole, but they are also presented separately for each of the 10 CMS regions. The States included in each region are:

- Region I: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont (CT, ME, MA, NH, RI and VT)
- Region II: New Jersey, New York (NJ and NY)
- Region III: Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia (DE, DC, MD, PA, VA and WV)
- Region IV: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee (AL, FL, GA, KY, MS, NC, SC and TN)
- Region V: Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin (IL, IN, MI, MN, OH and WI)
- Region VI: Arkansas, Louisiana, New Mexico, Oklahoma, Texas (AR, LA, NM, OK and TX)
- Region VII: Iowa, Kansas, Missouri, Nebraska (IA, KS, MO and NE)

Region VIII: Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming (CO, MT, ND, SD, UT and WY)

Region IX: Arizona, California, Hawaii, Nevada (AZ, CA, HI and NV)

Region X: Alaska, Idaho, Oregon, Washington (AK, ID, OR and WA)

RUCA Codes

Rural-Urban Commuting Areas codes (RUCAs) are integers from 1.0 to 10.0, with subcategories (e.g., 10.4, 10.5) that classify an area into a category that further describes the degree to which a place is urban or rural. Each zip code in the United States has a corresponding RUCA code, which can be obtained from the WWAMI (Washington, Wyoming, Alaska, Montana, & Idaho) Rural Health Research Center website. The zip codes with RUCAs were matched to the zip code reported for each home. This allowed the research team to classify each nursing home into one of the RUCA categories.

The more detailed RUCAs were grouped into four aggregate categories (as suggested by WWAMI): urban focused, large rural city/town focused, small rural town focused, and isolated small rural town focused. The exact RUCA code grouping was:

Urban: 1.0, 1.1, 2.0, 2.1, 2.2, 3.0, 4.1, 5.1, 7.1, 8.1, and 10.1

Large City/Town: 4.0, 5.0, and 6.0

Small Town: 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1, and 9.2

Isolated Small Town: 10.0, 10.2, 10.3, 10.4, and 10.5

These four categories were used in all tables in this report. They are labeled: Urban, Large Town, Small Town, and Isolated. "Urban" areas refer to zip codes in an urban core area with a population greater than or equal to 50,000 or zip codes in which a significant proportion of the population commute into such an urban center. Those areas defined as "Large Town" refer to zip codes in an urban place with a population between 10,000 and 49,999, and those zip codes where a substantial proportion of the population commutes into the large town. Those areas defined as "Small Town" refer to zip codes in a place with a population between 2,500 and 9,999 persons or an area in which a relatively large proportion of the population commute into the small town. "Isolated" areas are the remaining rural areas that lack substantial commuting to urban centers, large towns, or small towns. The description above provides a "flavor" of the logic of the classification system, however, it is a more complex process than described here. For more information on RUCAs codes refer to the WWAMI Rural Health Research Center home page accessible at the following address: <http://www.fammed.washington.edu/wwamirhc>.

MDS Variables

All the information in this volume comes from the MDS. Information on the specific items in the MDS and the response codes is available from the CMS website (<http://www.cms.hhs.gov/medicaid/mds20/>).

MDS Scales

Three MDS-based scales are used in our presentation. These scales are the Cognitive Performance Scale (CPS),⁴ the MDS ADL Hierarchy (MDS-ADLH),⁵ and the MDS Changes in End-Stage disease and Signs and Symptoms score (MDS-CHESS).⁶ For ease of comparison or because of sparse distributions, some scale categories were collapsed in the presentation of scale data in this volume.

The MDS-CHESS is composed of four components -- the presence of end-stage disease, decline in cognition, decline in ADLs, and a group of signs and symptoms (dehydration, weight loss, leaving 25% of food uneaten, shortness of breath, and edema). These indicators are combined into a five level scale with each upward increment in the scale representing an increased likelihood of mortality, more intense service use, and increased frailty.⁶

The MDS-ADL Hierarchy is based on residents' scores on four ADLs -- personal hygiene (early loss), locomotion and toilet use (mid-loss), and eating (late loss). Residents are then classified, based on their functional abilities in these four areas, into one of seven categories. These categories range from zero, in which the resident is independent in all four ADLs, to six, in which the resident is totally dependent in all four ADLs.⁵

The CPS measures cognitive function using MDS indicators of short-term memory problems, impairment in expressive communication, and the degree of impairment in decision-making. Indicators of coma and problems eating are used to differentiate among those residents highly impaired in memory, communication, and decision-making. The scale ranges from zero to seven. Higher scores on the scale indicate greater levels of impairment in cognitive performance.⁴

Case-Mix Measures

The procedures for the calculation of the two MDS-based RUG-III⁷ case-mix measures used in this volume, which vary slightly from the CMS RUG-III case-mix indices, were provided by Dr. Brant Fries of the School of Public Health at the University of Michigan at Ann Arbor, the primary developer of the RUG-III case-mix classification model.

Quality Indicators

The MDS-based Quality Indicators used in this volume were developed by the Center for Health Services Research and Analysis at the University of Wisconsin-Madison.⁸ The specific definitions for each measure can be found on the CHSRA website (http://www.chsra.wisc.edu/CHSRA/Quality_Indicators/toc.htm).