

Differences in Case-Mix between Rural and Urban  
Recipients of Home Health Care



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# Differences in Case-Mix between Rural and Urban Recipients of Home Health Care

## Executive Summary

Medicare pays for home health care for beneficiaries who require certain services but for whom travel to receive care is physically and/or mentally difficult or not medically recommended. Covered services include skilled nursing care; physical, occupational and speech-language pathology services; medical social services; and home health aide services. A beneficiary who has experienced a stroke and needs rehabilitative and support care during the recovery period is one example.

Home health care is both an important part of the care continuum for Medicare beneficiaries and a major program cost. However, little information about the actual health status and needs of the population receiving home health services has been published. Thus, the purpose of the analysis reported here is to provide a thorough, clinically based description of the health status and service needs of rural and urban Medicare home health patients based on a professional assessment of their condition at the start of care. The Centers for Medicare and Medicaid Services (CMS) requires that each home health care recipient be assessed at the start of care using a set of questions developed to reflect the specific needs of home health patients. Our report is based on a review of 1,468,465 unique beneficiary assessments from the 2010 Outcome Assessment Information Set (OASIS).

### Key findings about *all home health patients*:

- Overall, home health patients were severely impaired in their abilities for movement, self care, and medication management. This is an extremely vulnerable patient population:
  - The majority (80.7 percent) were taking five or more medications;
  - Most patients (82.1 percent) had difficulty transferring, that is, moving from one position to another such as from lying in bed to standing.
  - A high proportion of patients could not walk either independently or with only a one-handed cane (73.7 percent).
  - Slightly more than half (53.1 percent) needed assistance to use a toilet, commode or bedpan; a substantial proportion (45.5 percent) were incontinent.
  - Slightly more than a quarter of patients (27.2 percent) had an open surgical wound that required care.

### Key comparisons between *rural and urban* home health care patients:

- Rural home health care patients were more ill than their urban counterparts, based on higher levels of diagnostic severity, more risk factors for hospitalization and poorer overall status. In adjusted analysis, rural residence was associated with higher odds that the patient would be in a fragile or serious condition (OR 1.16, 95% confidence interval 1.14-1.16).
- Rural residents were more likely to receive respiratory treatments such as oxygen (21.1 percent rural, 14.6 percent urban). Need for respiratory therapies may be linked to the greater prevalence of reported smoking in rural cases (rural, 15.5 percent, urban 11.9 percent).
- Rural residents were more likely to have a surgical wound that required care (rural, 29.8 percent, urban 26.7 percent).

## Introduction

Medicare pays for home health care for beneficiaries who require certain services but for whom travel to receive care is physically and/or mentally difficult or not medically recommended. Covered services include skilled nursing care; physical, occupational and speech-language pathology services; medical social services; and home health aide services. A beneficiary who has experienced a stroke and needs rehabilitative and support care during the recovery period is one example. Appropriate use of home health care can reduce re-hospitalization and the need for more intensive forms of long term care.

Home health care is important for rural America because the rural population as a whole includes proportionately more persons over age 65 and more persons with chronic conditions such as diabetes and heart disease. Planning for services to meet the needs of an aging population across the continuum of care requires accurate information concerning patient characteristics and needs. However, little information about the actual health status and needs of the population receiving home health services has been published. Thus, the purpose of the analysis reported here is to provide a thorough, clinically based description of the health status and service needs of rural and urban Medicare home health patients based on a professional assessment of their condition at the start of care. Information about the demographic characteristics of home health recipients and technical definitions associated with this report are provided in the Technical Notes found at the end of the report. In the sections below, key patient characteristics associated with the complexity of providing adequate home health care are described.

### 1. Support available in the home

Nationally, most home health patients lived at home with another person (63.9 percent); the proportion living with others was larger among rural cases than among urban cases (65.9 percent rural versus 63.6 percent urban). Conversely, urban patients were more likely to be living in congregate settings such as assisted living than were rural home health recipients (9.6 percent urban versus 6.1 percent rural). The proportion of rural home health cases in congregate settings declined with rurality, from 7.0 percent in micropolitan counties to 3.8 percent in remote rural counties (Table 1, below).

<i>Living situation of home health care recipient</i>	Total	Urban	Rural	<i>Within rural counties:</i>		
				<i>Micropolitan</i>	<i>Small Adjacent</i>	<i>Remote</i>
	%	%	%	%	%	%
Alone	27.1	26.9	28.0	27.7	28.4	29.0
With another person	63.9	63.6	65.9	65.3	66.8	67.2
In a congregate setting (e.g., assisted living)	9.0	9.6	6.1	7.0	4.8	3.8

### 2. Patient ability for self-care

The ability of home health care patients to care for themselves can be influenced by multiple factors, including cognitive status and physical limitations. Most home health patients were able to see, hear and speak and were cognitively intact but had difficulty moving or in their ability to carry

out the activities needed to maintain good health. A majority of patients, 80.4 percent, received at least daily help in carrying out activities or instrumental activities of daily living (81.7 percent rural and 79.9 percent urban). This help may have come from paid providers or from family members.

***Physical and cognitive impairment***

Home health patients experienced significant limitations in movement. Overall, 82.1 percent of patients had difficulty transferring, that is, moving from one position to another, such as from lying in bed to standing. A high proportion of patients could not walk either independently or with only a one-handed cane (73.7 percent). Slightly more than half (53.1 percent) needed assistance to use a toilet, commode or bedpan. Rural and urban patients were similar in movement restrictions.

Rural and urban home health care patients differed only slightly in cognitive status. The majority of patients were classified as fully mentally capable, able to understand and remember tasks and directions (57.9 percent), or required prompting only when under stress (28.4 percent). Fewer than one percent of patients receiving care at home were totally dependent. The proportion of patients requiring assistance because of any level of loss of cognitive ability was similar in rural and urban patients (13.5 percent rural and 13.8 percent urban).

Relatively few home health patients experienced severe limitations in vision, hearing or speech. Nationally, only 1.5 percent were severely hearing impaired and only 1.8 percent had severely impaired vision. A larger proportion of patients had impaired speech (2.2 percent). Differences across residence were small and did not suggest that rural patients were systematically more limited.

***Activities of daily living***

OASIS assessments evaluate each patient’s abilities with regard to basic activities of daily living (ADLs: bathing, dressing, moving, toileting, transferring, eating) and instrumental activities of daily living (IADLs: transportation, shopping, preparing meals, managing medications, using the telephone, and managing equipment). Deficits in ability to carry out ADLs and IADLs may stem from physical or cognitive impairments.

Home health patients often required assistance in activities of daily living such as eating or grooming (See Table 2, at right). The area in which most home health patients required some level of assistance was bathing, followed by dressing the lower and upper body. With the exception of bathing, rural residents were slightly less likely than urban home health cases to need assistance in each of these areas. However, differences between the two groups were small and did not suggest major differences in this aspect of patient management.

Instrumental activities of daily living are tasks that an individual must conduct or have assistance with to live independently. As was the case for core activities of daily living, there were

Table 2. Limitations in ability to carry out activities of daily living\* among home health care patients, by residence, 2010 OASIS, in percent

<i>Requires assistance or dependent on others for:</i>	Total	Urban Patients	Rural Patients
	%	%	%
Eating	46.6	47.0	44.7
Dress, upper body	73.3	73.4	72.8
Dress, lower body	79.9	80.0	79.5
Grooming	65.9	65.9	65.6
Toilet hygiene	58.3	58.5	57.5
Bathing	82.8	82.4	84.5

\* See Technical Notes for full definitions.

only small differences between rural and urban home health cases in ability to conduct necessary activities. Most home health patients were unable to prepare a light meal, such as a sandwich, without assistance (overall, 76.6 percent; urban 76.8 percent, rural 75.7%). Most home health patients needed assistance for oral medications (64.6 percent). About one in every seven patients needed help to manage injectable medications (14.1 percent). Rural residents were more likely to require assistance with injectable medications than were urban patients (See Table 3, above) A slightly lower proportion of rural than urban residents required assistance with preparing a meal or using a telephone.

Table 3. Limitations in ability to carry out instrumental activities of daily living* among home health care cases,** by residence, 2010 OASIS, in percent			
<i>Requires assistance or dependent on others for:</i>	Total	Urban Patients	Rural Patients
	%	%	%
Prepare light meals	76.6	76.8	75.7
Manage oral medication*	64.6	64.6	64.7
Manage injectable medication*	14.1	13.8	15.8
Use telephone	23.3	23.4	22.7
* See Technical Notes for full definitions.			
**A small number of records did not contain information on the patient's current medication management, if any (n = 4,394).			

### 3. Clinical elements of patient status

The OASIS system assesses patient need across multiple dimensions including the severity of the diagnoses requiring home health care, the degree to which the patient has one or more risk factors for being re-hospitalized, specific factors that may complicate care or carry risk for infection such as incontinence, or the receipt of special therapies. These assessments are presented here.

#### *Diagnostic severity*

Severity was measured for each diagnosis related to a beneficiary's home health care episode. The analysis below focuses on the severity of the principal diagnosis associated with the episode of care. Each patient was assigned one of four values for diagnostic severity:

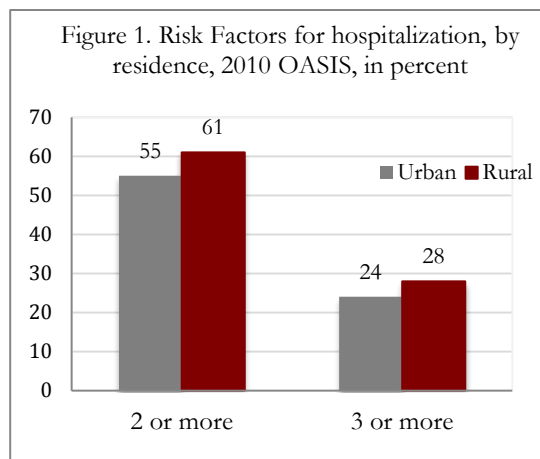
- Symptoms well controlled. Few home health patients nationally fell into this category (1.9 percent overall; 1.7 percent rural and 1.9 percent urban).
- Symptoms controlled with difficulty. About two of every five home health patients (40.5 percent overall; 35.8 percent rural and 41.5 percent urban care) were coded into this category.
- Symptoms poorly controlled; patient needs frequent adjustment. This was the most common overall rating for diagnostic severity, with 48.8 percent of cases (50.7 percent rural and 48.4 percent urban).
- Symptoms poorly controlled; history of re-hospitalization. Nationally, 8.9 percent of cases were classified in this category (11.9 percent rural and 8.3 percent rural).

Rural patients were more likely to fall into the two highest severity categories than were urban patients particularly if they lived in small or remote counties (Notes, Table T1). The pattern of rural disparity is present within race/ethnicity groups with rural cases within each race being more likely than urban cases to fall into the highest severity level (Notes, Table T2). For example, while 8.8 percent of urban white patients were in the most severe category, this value increased to 13.6 percent among rural American Indians and 17.7 percent among rural Asian/Pacific Islander cases.

### ***Risk Factors for Hospitalization***

The OASIS assessment for risk of hospitalization includes six possible factors, including “other.” Patients may experience more than one risk factor or may have none of them. Rural home health patients were more likely to experience each of the possible risk factors and less likely to be coded as “none” than were their urban counterparts:

- **Taking five or more medications.** Polypharmacy was common among home health patients; 80.7 percent of cases were taking five or more prescription medications (82.6 percent rural, 80.4 percent urban).
- **Multiple hospitalizations** (2 or more) in past 12 months. Overall, 24.5 percent of cases had experienced 2 or more hospitalizations in the past year (26.7 percent rural, 24.1 percent urban).
- **History of falls** (2 or more) in past 12 months. Among all cases, 27.0 percent had a history of falls (29.4 percent rural, 26.5 percent urban).
- **Frailty indicators.** Frailty is a generalized concept centering on physical weakness; presence of frailty was coded for 25.6 percent of patients (27.9 percent rural, 25.2 percent urban)
- **Recent decline** in mental, emotional or behavior status. Recent decline was recorded for 14.3 percent of cases overall (14.7 percent rural, 14.2 percent urban).
- **Other.** The “other” category was highlighted for 10.9 percent of cases (12.5 percent rural, 10.6 percent urban).
- **None** of the above. “None” was indicated for only 7.2 percent of all cases (6.1 percent rural, 7.4 percent urban).



In addition to having a higher prevalence of each individual risk factor for hospitalization, rural residents were more likely to experience multiple risk factors for hospitalization (See Figure 1, above). While 7.5 percent of urban patients had four or more risk factors for hospitalization, 9.1 percent of all rural patients were at this risk level. In remote rural counties, 9.7 percent of patients had four or more risk factors for hospitalization.

### ***Other clinical risk factors***

About one fifth of home health patients, 21.5 percent, were reported to experience severe pain (See Table 4, at right). Rural patients were more likely to have a surgical incision (wound) than were their urban peers. Rural patients were also more likely than urban cases to experience shortness of breath or urinary incontinence. A small proportion of home health patients required a urinary catheter (a tube inserted in the urethra to allow bladder drainage; 3.7 percent), or had an ostomy (an opening in the bowel to allow removal of stool; 1.7 percent).

<i>Clinical risk factors</i>	Total Patients	Urban Patients	Rural Patients
	%	%	%
Severe pain	21.5	21.4	22.1
Surgical wound	27.2	26.7	29.8
Shortness of breath	14.6	13.5	19.9
Urinary Incontinence			
Incontinent	45.5	44.7	49.1
Requires urinary catheter	3.7	3.6	3.9
Ostomy present	1.7	1.6	1.9



### ***Special Therapies***

Respiratory therapies include oxygen, ventilator, or airway pressure devices. In total, 15.7 percent of home health care patients received one or more respiratory treatments in their homes (21.1 percent rural, 14.6 percent urban). The rate of respiratory therapy use increased with rurality from 20.6 percent in micropolitan counties to 20.9 percent in small adjacent rural counties and 24.7 percent in remote rural counties. Higher needs for respiratory therapy were possibly associated with the higher prevalence of smoking reported for rural patients. Nationally, 12.5 percent of home health cases were reported to smoke. Among urban patients 11.9 percent smoked versus 15.5 percent among rural patients.

A small proportion of home health care cases received intravenous infusion therapy (2.4 percent), enteral nutrition (feeding through a naso-gastric tube; 1.2 percent), and/or parenteral nutrition (meeting nutrition needs through a solution dripped into a vein 0.13 percent). The proportion of patients needing one or more of these therapies was similar in rural and urban counties.

## **4. Overall assessment of patient status**

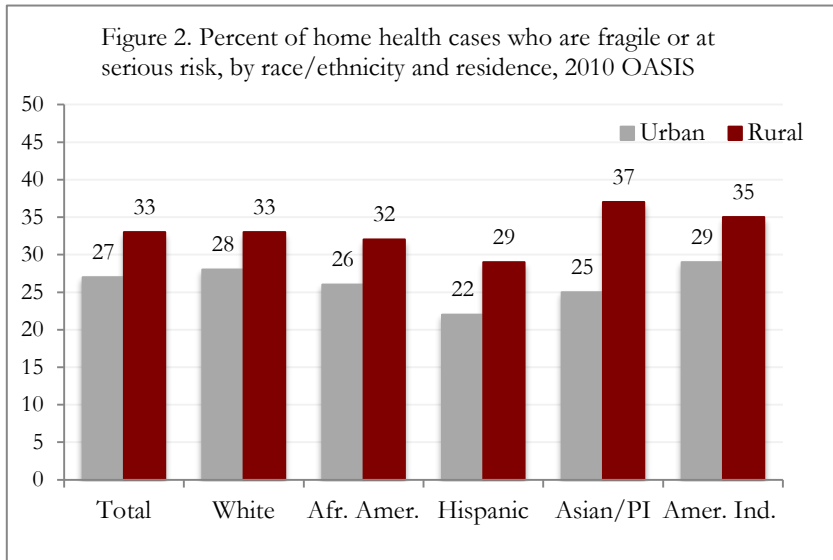
The professional assessing the home health patient provides his or her best judgment regarding the overall health status of the patient taking into consideration all of the diagnostic and therapy information available. The assessment places patients in one of four major categories:

- **Stable**: patient is stable with no heightened risk(s) for serious complications and death beyond those typical of the patient's age. Overall, 18.5 percent of cases fall into this category (rural, 15.8 percent; urban 19.0 percent).
- **Temporary risk**: patient is temporarily facing high health risk(s) but is likely to return to being stable without heightened risk(s) for serious complications and death beyond those typical of the patient's age. This is the more common group overall with 53.2 percent of cases being rated as temporarily at risk (50.7 percent rural; 53.7 percent urban).
- **Fragile**: Patient is likely to remain in fragile health and have ongoing high risk(s) of serious complications and death. Slightly less than a quarter of all home health cases (24.1 percent) fall into this risk category (27.9 percent rural; 23.3 percent urban).
- **Serious**: Patient has serious progressive conditions that could lead to death within a year. Overall, 3.9 percent of cases are rated serious (5.4 percent rural; 3.6 percent urban).
- **Unknown**: Patient's situation is unknown or unclear. A very small number of cases, 0.3 percent overall, were classified as unknown or unclear (0.3 percent rural; 0.4 percent urban).

Nationally, 28.1 percent of all home health patients were characterized as being either fragile or at serious risk. Rural patients were more likely to fall in this highest severity category than were urban patients (see Figure 2, next page). Differences in severity associated with rural residence were consistent across racial/ethnic groups, with rural home health care patients being more likely to fall in the highest two severity groups than were their urban peers. The size of the rural disparity varied with race with the rural / urban difference being greatest among Asian/Pacific Islander patients.

**Adjusted assessment of condition**

To verify that rural residence was associated with higher risk of being categorized as fragile or serious, rather than differences in demographic and clinical characteristics between rural and urban residents, we conducted several multivariable analyses. First, we simply examined the risk of having an overall status of fragile or serious condition among all patients. We then examined overall status within patients receiving care for three specific diagnoses: cerebrovascular disease (stroke), diabetes, and joint replacement.



Results were mixed (Table 5, at right), but suggest that rural patients were at higher risk for fragile/serious status even after taking other characteristics into consideration. When all cases were considered, among patients with a principal diagnosis of cerebrovascular disease or stroke, rural residents were at higher odds for poor overall status. Among patients receiving care subsequent to joint replacement therapy, a procedure generally provided only for patients who are otherwise healthy, residence was not associated with the risk for having fragile/serious status.

Patients included:	Adjusted* Odds Ratio	95% Confidence Interval	
		Lower Limit	Upper Limit
All cases (n=1,4684,65)	1.16	1.14	1.16
Cerebrovascular (stroke; n=54,515)	1.18	1.12	1.25
Diabetes (n=91,634)	1.06	1.02	1.11
Joint replacement (n=104,958)	0.92	0.90	1.04

\* Adjusted for sex, age, living situation (alone or with others), payment status (dual versus other), region, and county characteristics (physician/population ratio, presence of a home health agency, skilled nursing facility, and hospital)

**5. Summary and Conclusions**

Medicare home health patients in both rural and urban counties constitute a frail, at-risk population. By program intent, home health care is only reimbursed for beneficiaries who are no longer capable of traveling for care or for whom such travel would be extremely difficult. Thus, it is not surprising that most patients had difficulty walking or using a wheelchair (73.7 percent), needed help transferring from one position to another (82.1 percent), or could not prepare a light meal such as reheating food provided by a social service agency without assistance (76.6 percent). Rural and urban home health care recipients were similar across these measures. However, rural beneficiaries still pose unique challenges for their home health care providers. These challenges, in turn, may affect the solvency of rural home health care providers.

### ***Patient complexity and Medicare margin***

In a recent analysis, Rosati and associates<sup>1</sup> examined the association between patient characteristics and Medicare home health reimbursement margins finding that the most vulnerable patients were associated with the lowest margins. Patients who needed skilled nursing care for complex conditions, for example, generated lower margins than patients for whom specific therapies were delivered such as persons recovering from hip fracture or stroke. The Rosati study was limited to 26 non-profit home health agencies principally drawn from the Northeast. However, if the findings are applicable nationally then their work suggests that home health agencies serving rural populations are particularly at risk. Rural beneficiaries share many of the characteristics that define a vulnerable home health patient in the analysis by Rosati's team.

Rural patients studied in the present report were more likely to live alone, particularly in remote rural counties, and correspondingly less likely to live in congregate settings such as assisted living facilities (Table 1). While rural patients did not differ from their urban peers with regard to the severity of limitations in activities of daily living (Tables 2 and 3), they were more likely to present clinically complex challenges as indicated by the higher proportion of rural patients with two or more risk factors for hospitalization (Figure 1). Similarly, rural patients were more likely to be receiving some form of respiratory therapy (21.1 percent versus 14.6 percent) and to require assistance with injectable medication (15.8 percent versus 13.8 percent). Finally, rural patients were more likely to be fragile or at serious risk (Figure 2; Table 5). All of these measures of patient vulnerability were found to be associated with lower margins in the Rosati study.

### ***Implications***

Differences in patient populations, rather than provider inefficiencies or waste, may underlie some of the differences in utilization and payment noted by the Medicare Payment Advisory Commission (MedPAC) in its 2014 report.<sup>2</sup> The MedPAC analysis, based on billing data with no adjustment for patient characteristics, found that 2012 Medicare margins for free-standing home health agencies that served “mostly rural” patients were lower than those serving “mostly urban” patients (12.8 percent rural versus 14.8 percent urban; p. 226). Providing adequate nursing care services to medically complex patients, rather than patients who need more profitable therapy services, may contribute to lower margins among rural providers. Methods for rebasing payment for home health services will need to ensure that clinical differences are taken into consideration so that rural patients and providers are not adversely affected.

The Commission also expressed concern that rural beneficiaries might be overusing benefits noting that twenty of the twenty-five counties with the highest proportion of beneficiaries accessing home health care in 2012 were rural (p. 224). If the distribution reflected the proportion of all U.S. counties that are rural, only fourteen rural counties (61 percent) would fall into the top group. While the Commission's concern about over utilization is appropriate to its mission, a “small numbers” problem may be contributing to the definition of outliers when using rates alone. For example, the top three rural counties cited by MedPAC are all in Texas with relatively small population sizes

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<sup>1</sup> Rosati RJ, Russell D, Peng T, Brickner C, Kurowski D, Christopher MA, Sheehan KM. Medicare home health payment reform may jeopardize access for clinically complex and socially vulnerable patients. *Health Aff* (Millwood). 2014 Jun;33(6):946-56.

<sup>2</sup> Medicare Payment Advisory Commission, *Report to the Congress Medicare Payment Policy*, March 2014, Chapter Nine, Home health care services. Washington DC.

(Duval, 11,782; Brooks, 7,222; Jim Hogg, 5,265).<sup>3</sup> Correspondingly, the absolute number of Medicare beneficiaries in each of these counties is also small (Duval, 1,414; Brooks, 972; Jim Hogg, 608). Both Brooks and Duval counties lack any primary care physician and fall into the worst-performing quartile across the U.S. for ambulatory care sensitive admission rates among Medicare beneficiaries. Jim Hogg county has one physician and falls into the next quartile still below the national median. From a research perspective, more nuanced examination of the clinical status of both the underlying population and the specific needs of patients in rural counties may help clarify some of the observations made by the Commission. High utilization may result from higher hospitalization rates which in turn could be associated with poor availability of primary care.

The brief snapshots of Duval, Brooks and Jim Hogg counties are relevant to an additional Commission recommendation that home health agencies be incentivized through the Hospital Readmission Reduction Program. As described in the 2014 Report, this would entail financial penalties for agencies that did not meet readmission targets (p. 230) with adjustment for patient characteristics associated with re-hospitalization risk such as dual eligibility status. While providers across the continuum of care should coordinate to improve patient well-being and reduce unnecessary hospitalization, the resources for coordination may be severely strained in rural counties. It may be appropriate to include adjustment for the local availability of health care providers as well as for patient specific risks. Overall, caution will be needed to ensure that rural home health providers are not penalized as a result of an inadequate primary care system.

As payment reforms are implemented, the level of home health care availability should be monitored closely in rural areas which generally are served by fewer home health providers than are urban areas. Reductions in home health availability, should these occur, could have unintended consequences through a possible relationship between availability of home health services and the proportion of Medicare beneficiaries who are able to live independently. Research suggests that a reduction of 1 visit per episode results in a 0.22 percent increase in the proportion of beneficiaries who have to enter shared living arrangements such as living with children.<sup>4</sup> Given the greater severity of illness among rural home health care recipients, effects on rural residents may be greater than those for the nation as a whole. The effects of shared living for both beneficiaries and families have not been explored. Changes in home health availability, if these occur, will need to be assessed for effects on living situations among rural beneficiaries including use of residential long term care and for effects on the health and health services use of these individuals.

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<sup>3</sup> Data drawn from the Robert Wood Johnson 2013 *County Rankings* data base.

<sup>4</sup> Orsini C. Changing the way the elderly live: Evidence from the home health care market in the United States. *J Pub Economics* 2010; 94:142-152.

## Technical Notes

### Information sources

Information on the relative status and severity of rural and urban home health cases was drawn from the Outcome Assessment Information Set (OASIS) maintained by the Centers for Medicare and Medicaid Services (CMS). CMS requires that each home health care recipient be assessed at the start of care and at discharge from care using a set of questions developed to reflect the specific needs of home health patients. OASIS information about the patient's condition and needs for care is used to adjust the standard payment rate (details available at [http://www.medpac.gov/payment\\_basics.cfm](http://www.medpac.gov/payment_basics.cfm)). Patients must also be assessed for further care at the end of each 60 days of care, when/if the patient's condition changes, and if returning to care after an inpatient stay. Topics covered in the OASIS assessment go beyond basic diagnostic information to include the patient's overall status and severity of impairment; ability to carry out activities needed to live independently, such as preparing a meal and eating it; risk factors for hospitalization; and living situation. Our report presents the absolute prevalence of each risk factor among rural cases; estimates are not adjusted to reflect the demographic differences between rural and urban home health care recipients.

The start of care case assessment, on which this report is based, must be conducted within the first five days of CMS-funded home health care. The information presented here was based on assessments conducted in calendar year 2010. Home health recipients include beneficiaries younger than 65 such as disabled persons or those with end stage renal disease. For beneficiaries with multiple start of care case assessments, only the earliest case assessment was included. Of the 1,994,312 total assessments, we excluded 525,847 (26.4 percent) due to missing patient residence or multiple start of care case assessments, leaving 1,468,465 assessments as the basis for the report.

The OASIS assessment can be conducted by a registered nurse (RN), a physical therapist (PT), a speech and language therapist or speech pathologist (SLT/SP), or by an occupational therapist (OT). Nationally, most assessments were conducted by RNs (88.2 percent). Rural assessments overall were more likely to be conducted by an RN than were urban assessments (91.9 percent versus 87.4 percent). The proportion conducted by RNs increased with rurality from 91.2 percent in micropolitan counties to 92.9 percent in small adjacent rural counties and to 93.9 percent in remote rural counties.

Rural residence was classified at the county level using the 2003 Urban Influence Codes (UIC) of the U.S. Department of Agriculture's Economic Research Service. UICs of 1 and 2 were classified as "Urban" while all other UICs were classified as rural. Analysis across levels of rurality used three groups: "micropolitan rural" (UICs 3, 5 and 8) "small adjacent rural" (UICs 4, 6 and 7) and "remote rural" (UICs 9, 10, 11 and 12). Patient residence and provider location were each recorded in the OASIS data set.

We do not routinely report statistical significance in the text of the report. Statistical significance depends on two factors: the size of differences between categories and the size of the groups being compared. With more than one million assessments being examined, virtually all differences will be *statistically* significant. Small differences may have little clinical or practical importance. When rural and urban home health patients differ by less than a percentage point on a specific characteristic, only the national value will be provided. For example, the majority of home health patients are unable to prepare light meals for themselves (76.6 percent). Since rural and urban patients are highly similar on this characteristic (rural, 75.7 percent, urban 76.8 percent), they would not be described separately.

Limitations: Private pay patients are not included in OASIS, thus the information presented here only pertains to Medicare beneficiaries along with a small proportion of Medicaid-only patients. Some research has suggested that OASIS is less effective than a clinical record review in identifying all possible diagnoses experienced by patients; however, home health agencies are instructed only to record diagnoses relevant to the home health care episode. Next, because start of care assessments must be repeated for every new 60-day episode of care or for every major change in patient health status, there is often more than one assessment for each patient. To provide a description of home health *patients*, this report included only the earliest care assessment conducted on a patient. Because each person is included only once, our report uses the terms “cases” and “patients” interchangeably. Finally, because our analysis only examines beneficiaries who received home health care, we cannot identify differences between those who did and those who did not use this service

### Demographic Characteristics of Home Health Patients

A majority of home health cases in 2010 involved beneficiaries who lived in urban counties (83.1 percent urban, versus 16.9 percent in rural counties). Among rural beneficiaries, 63.6 percent lived in micropolitan counties (10.8 percent of all cases), 27.5 percent lived in small, adjacent counties (4.7 percent of all cases), and 8.9 percent lived in remote rural counties (1.5 percent of all cases).

The majority of cases involved female patients (62.7 percent). Rural home health patients, on average, were about a year younger than urban patient, 76.0 years of age versus 76.9 years among urban residents. Most home health cases were white patients (77.9 percent nationally); the proportion of white patients was higher in rural than in urban counties (87.2 percent versus 76.0 percent). The proportion of white patients varied with level of rurality, at 87.2 percent in micropolitan counties, 86.3 in small adjacent rural counties, and 89.9 percent in remote rural counties. African American, Hispanic and Asian/Pacific Islander patients were proportionately more frequent in urban counties while the highest proportion of American Indian/Alaska Native cases, 1.02 percent, was found in remote rural counties.

The majority of rural patients were insured by Medicare alone (89.1 percent). Nationally, 3.6 percent of cases were funded by Medicare plus Medicaid; this type of funding was most common in remote rural counties (4.4 percent). Funding by Medicare plus some other form of insurance was also most common in remote rural counties, 8.0 percent versus the national average of 5.9 percent.

### Definitions for Section 2, Patient ability for self-care

If the home health patient’s assessment fell into any of the categories listed, they were deemed to require assistance:

Category	Levels of activity classified as less than independent
<i>Cognitive Function</i>	<p>Requires <u>some assistance/direction</u>: Requires assistance/direction in specific situations (e.g. all tasks involving shifting of attention) or consistently requires low stimulus environment due to distractibility</p> <p><u>Considerable assistance</u> required: Requires considerable assist in routine situations. Is not alert and oriented or is unable to shift attention and recall directions more than half the time</p> <p><u>Totally dependent</u>: Totally dependent due to disturbances such as constant disorientation, coma, persistent vegetative state, or delirium</p>

<i>Movement</i>	
Ambulation	Two-handed device: <u>Requires use of a two-handed device</u> (e.g. walker or crutches) to walk alone on a level surface and/or requires human supervision or assistance to negotiate stairs or steps or uneven surfaces <u>Supervision Required:</u> Able to walk only with the supervision or assistance of another person at all times <u>Chairfast</u> Dependent: Chairfast (wheelchair bound), unable to ambulate and is unable to wheel self <u>Bedfast:</u> Bedfast, unable to ambulate or be up in a chair
Transferring	Bear weight and Pivot: Able to bear weight and pivot during the transfer process but <u>unable to transfer self</u> <u>Unable to transfer or assist:</u> Unable to transfer self and is unable to bear weight or pivot when transferred by another person <u>Bedfast, Able to turn:</u> Bedfast, unable to transfer but is able to turn and position self in bed <u>Dependent:</u> Bedfast, unable to transfer and is unable to turn and position self
Toileting	<u>Requires reminders, assistance, or supervision:</u> When reminded, assisted, or supervised by another person, able to get to and from the toilet and transfer <u>Use of commode:</u> Unable to get to and from the toilet but is able to use a bedside commode (with or without assistance) <u>Use of bedpan/urinal:</u> Unable to get to and from the toilet or bedside commode but is able to use a bedpan/urinal independently <u>Dependent:</u> Is totally dependent in toileting
<i>Other Activities</i>	
Eating	Requires assistance to feed: <u>Unable to feed self</u> and must be assisted or supervised throughout the meal/snack <u>Received supplemental nutrients:</u> Able to take in nutrients orally and receive supplemental nutrients through a nasogastric tube or gastrostomy <u>Fed through nasogastric tube or gastrostomy:</u> Unable to take in nutrients orally and is fed nutrients through a nasogastric tube or gastrostomy <u>No oral or tube feeding:</u> Unable to take in nutrients orally or by tube feeding
Dress, upper or lower body	<u>Able to dress, if clothing is provided:</u> Able to dress without assistance if clothing is laid out or handed to the patient <u>Assistance needed:</u> Someone must help the patient put on clothing <u>Dependent:</u> Patient depends entirely upon another person to dress
Grooming	Grooming utensils required: <u>Grooming utensils must be placed within reach</u> before able to complete grooming activities <u>Need assistance:</u> Someone must assist the patient to groom self <u>Dependent:</u> Patient depends entirely upon someone else for grooming needs
Toilet hygiene	Supplies required: Able to manage toileting hygiene and clothing management without assistance if <u>supplies/implements are laid out</u> for the patient <u>Needs assistance:</u> Someone must help the patient to maintain toileting hygiene and/or adjust clothing <u>Dependent:</u> Patient depends entirely upon another person to maintain toileting hygiene
Bathing	<u>Intermittent Assistance:</u> Able to bathe in shower or tub with the intermittent assistance of another person: (a) for intermittent supervision or encouragement or reminders, or (b) to get in and out of the shower or tub, or (c) for washing difficult to reach areas <u>Assistance Required:</u> Able to participate in bathing self in shower or tub, but requires presence of another person throughout the bath for assistance or supervision <u>Unable to Shower:</u> Unable to use the shower or tub, but able to participate in bathing self in bed, at the sink, in bedside chair, or on commode, with the assistance or supervision of another person throughout the bath <u>Dependent:</u> Unable to participate effectively in bathing and is bathed totally by another person
Meal preparation	<u>Unable due to limitations:</u> Unable to prepare light meals on a regular basis due to physical, cognitive, or mental limitations <u>Unable:</u> Unable to prepare any light meals or reheat any delivered meals

Medication management*	<u>Able with preparation from others</u> : Able to take medication(s) at the correct times if: (a) individual dosages are prepared in advance by another person; OR (b) another person develops a drug diary or chart <u>Able with reminders</u> : Able to take medication(s) at the correct times if given reminders by another person at the appropriate times <u>Unable unless administered</u> : Unable to take medication unless administered by another person
Telephone	<u>Limited ability</u> : Able to answer the telephone only some of the time or is able to carry on only a limited conversation <u>Unable to answer, listen with assistance</u> : Unable to answer the telephone at all but can listen if assisted with equipment <u>Unable to use phone</u> : Totally unable to use the telephone Patient does not have telephone

## Supplemental Tables

Table T1. Primary Diagnosis Severity Rating, by residence (n= 982,794 assessments\*)

<i>Cases by residence</i>	Total	Urban	Rural	Within rural counties:		
	%	%	%	<i>Micro-politan %</i>	<i>Small Adjacent %</i>	<i>Remote %</i>
Symptoms well controlled	1.9	1.9	1.7	1.8	1.5	1.3
Symptoms controlled with difficulty	40.5	41.5	35.8	36.5	34.8	33.7
Symptoms poorly controlled; patient needs frequent adjustment	48.8	48.4	50.7	50.2	51.6	51.5
Symptoms poorly controlled; history of rehospitalization	8.9	8.3	11.9	11.5	12.1	13.4

Table T2. Primary Diagnosis Severity Rating, by race and residence (n= 982,794 assessments)\*

<i>Symptoms are:</i>		Well controlled %	Controlled with difficulty %	Poorly controlled; frequent adjustment %	Poorly controlled; history rehospitalization %
White	Urban	1.9	41.6	47.7	8.8
	Rural	1.7	35.7	50.4	12.2
African American	Urban	1.7	39.2	51.3	7.8
	Rural	1.5	36.8	52.2	9.5
Hispanic	Urban	1.9	43.2	49.6	5.4
	Rural	1.4	36.5	53.7	8.4
Asian/PI	Urban	2.1	45.4	47.3	5.2
	Rural	N/A	33.1	47.5	17.7
American Indian	Urban	2.6	37.0	51.2	9.2
	Rural	3.7	32.1	50.6	13.6
Total		1.9	40.5	48.8	8.86

\*Note: Many records did not contain information on the patient's primary diagnosis severity rating, if any (n =485,671). The percent of records with missing data, by residence, is as follows: Urban (33.09), Rural (32.97), Micropolitan (33.46), Small Adjacent (31.93), Remote (32.68), Total (33.07).