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Rural/Urban Disparities in Utilization of Medical Nutrition Therapy to the Fee-for-Service Medicare Population

Christian Rhudy; Eugene Shin; Jeffery Talbert, PhD

Overview of Key Findings

- In 2016, 21.8% of the fee-for-service (FFS) Medicare population resided in a rural county, but only 3.7% of enrollees residing in a county with utilization of Medical Nutrition Therapy (MNT) services were rural county residents.
- Utilization of MNT services in 2016 occurred in 92 rural counties and 388 urban counties.
- Average utilization rates of MNT services were greater in rural counties than urban counties (3.1% vs. 1.9%).

Introduction

In the treatment of many disease states and conditions, lifestyle and dietary changes can be important to achieve positive outcomes. In order to guide effective dietary changes, patients with renal disease or diabetes can be provided Medical Nutrition Therapy (MNT). MNT involves the development of a nutrition plan for a patient with a physician or dietitian that is appropriate for the patient's condition or disease state.¹ After an assessment of the client, MNT involves determining the nutritional needs of the patient and prescribing a diet that will offer optimal outcomes.

MNT plays an important role in the treatment of a variety of chronic conditions, including diabetes mellitus, hypertension, obesity, and chronic kidney disease.²⁻⁵ Usage of MNT services has been shown to decrease hemoglobin A1c values by 1%-2% in patients with diabetes mellitus,² while also reducing systolic blood pressure up to 10 mmHg in hypertensive patients.³ Patients receiving MNT were also approximately twice as likely to obtain a clinically significant reduction in weight and were more likely to exercise more frequently.⁴ Utilization of MNT in patients with chronic kidney disease was observed to delay dialysis and slow decline in kidney function.⁵ Medicare reimburses up to three hours of MNT services within the first year of diagnosis of either renal disease or diabetes. After the first year, Medicare will cover two further hours of MNT services per year.⁶

Despite the effectiveness of MNT, comparatively low utilization rates have been observed in populations with certain disease states (such as diabetes mellitus).⁷ Additionally, differences in utilization and compliance with MNT-recommended regimens have been observed along socioeconomic and gender demographic lines.⁷⁻⁸

One potential variable affecting MNT utilization in the United States that has not yet been examined is the utilization of MNT services in rural versus urban communities. The objective of this study was to identify the utilization of MNT services in rural and urban communities by examining the population of Medicare fee-for-service (FFS) beneficiaries in 2016.

Methods

The Medicare Physician and Other Supplier Public Use File (PUF) provides information on services and procedures provided to FFS Medicare beneficiaries by physicians and other health care providers (including pharmacies and nurse practitioners).⁹ The PUF data contain information on utilization, payment, and charges by National Provider Identifier (NPI), Healthcare Common Procedure Coding System (HCPCS) code, and provider type for all providers delivering services to FFS Medicare beneficiaries. At the time of the study, 2016 was the most recent PUF available. The 2016 Medicare provider data were extracted and HCPCS codes G0270 and G0271, as well as CPT codes 97802-97804, were used to determine the number of units of MNT services provided, the number of health care providers administering the service, and the number of beneficiaries served by each provider. Provider services and beneficiaries were then aggregated at the county level using provider location data. Rural-Urban Continuum Codes (RUCCs) were used to assign counties to rural versus urban designations, with codes 1-3 designated as urban and codes 4-9 designated as rural.¹⁰ The 2016 FFS Medicare enrollment data,¹¹ as well as diabetes and chronic kidney disease (CKD) incidence rates,¹² were observed in aggregate and applied at the county level to calculate potentially eligible enrollees and MNT utilization rates.

Findings

In 2016, FFS Medicare enrollees increased to 33.9 million (Table 1), with an approximate 4:1 ratio of enrollees residing in urban (RUCC 1-3) to rural (RUCC 4-9) counties. In this population, 9.2 million (27.3%) had diabetes, while 7.6 million (22.3%) had chronic kidney disease. Among FFS beneficiaries, 6.5 million (19.4%) had comorbid diabetes and CKD, which represents 38.9% of FFS beneficiaries with either diabetes or CKD. When examined separately, the ratio of urban to rural residence in enrollees with diabetes or CKD was comparable to the same ratio for the total FFS population.

Table 1. Rural/Urban Enrollment in FFS Medicare Nationwide and in Counties Providing MNT Services, 2016

Category	2016 Nationwide Medicare FFS enrollees					
	Total	RUCC 1-3 (Urban)		RUCC 4-9 (Rural)		
		Enrollees	Percentage	Enrollees	Percentage	
All	33,851,996	26,455,562	78.2%	7,396,434	21.8%	
With Diabetes	9,247,673	7,245,302	78.3%	2,002,371	21.7%	
With CKD	7,562,534	6,024,435	79.7%	1,538,099	20.3%	
With Diabetes and CKD	6,533,747	*	*	*	*	
2016 Medicare FFS Enrollees in Counties Where MNT Services Were Utilized						
All	19,410,855	18,697,835	96.3%	713,020	3.7%	
With Diabetes	5,300,610	5,117,576	96.5%	183,034	3.5%	
With CKD	4,419,866	4,276,853	96.8%	143,013	3.2%	
Eligible Enrollees*	5,939,208	5,739,993	96.6%	199,215	3.4%	

*Comorbidity rates of diabetes and CKD were unavailable at the county level. Eligible enrollees were estimated utilizing the sum of beneficiaries with CKD/Diabetes less the national comorbidity average of 39.8%.

Of all FFS Medicare enrollees in 2016, over half (19.4 million, 57.3%) resided in counties where MNT services were utilized. In these counties, 5.3 million (27.3%) FFS beneficiaries had diabetes, while 4.4 million (22.8%) had CKD. This group of enrollees resided predominantly in urban counties (96.3%). In subsets with diabetes or kidney disease, no marked differences in proportions of urban to rural residence were observed.

The estimated number of eligible enrollees in counties utilizing MNT services was 5.9 million (30.6%). This estimate was calculated by adding the number of county enrollees with diabetes and CKD less the number of beneficiaries with comorbid CKD and diabetes. Because comorbidity rates were not publicly available at the county level, the number of beneficiaries with comorbid CKD and diabetes was estimated using the national average (39.8% of summed CKD/diabetes enrollees).

In 2016, 1,533 unique providers administered 405,105 units of MNT services to 92,392 unique beneficiaries (Table 2). MNT beneficiaries utilized a mean 4.4 units of MNT services in 2016. Beneficiaries in rural counties utilized fewer units of MNT services on average (4.0 units) than those in urban counties (4.4 units). While there is no clinical recommendation for the amount of MNT a patient should receive as treatment is highly individualized, this does suggest that rural beneficiaries receive shorter or fewer sessions of MNT.¹² The average MNT provider administered 264.3 units of MNT. MNT providers practicing in urban counties administered more than the national average (270.6 units), while rural providers typically administered significantly less (185.4 units).

Table 2. FFS Medicare MNT Providers, Service Hours and Beneficiaries in 2016

Category	Total	RUCC 1-3 (Urban)	RUCC 4-9 (Rural)
Providers	1,533	1,418	115
Service Units	405,105	383,779	21,326
Beneficiaries	92,392	87,116	5,276
Average County Utilization Rate	2.1%	1.9%	3.1%

County utilization rates were calculated as the number of Medicare FFS beneficiaries utilizing MNT services in a county divided by the estimated number of eligible enrollees in that county. The average county utilization rate for the total population was 2.1%. Rural counties on average had a higher utilization rate (3.1%) than urban counties (1.9%).

Figures 1 and 2 display diabetes and chronic kidney disease prevalence by county in the FFS Medicare population. This can be compared to the actual utilization of MNT services at the county level, as displayed in Figure 3. Disease prevalence appears to be greatest in the Southeast, but services are more localized to the Northeast and Midwest. Interactive maps depicting MNT providers, service hours, beneficiaries, and utilization rates at the county level can be found at <https://ruhrc.uky.edu/infographics/>.

Figure 1. Diabetes Prevalence in the FFS Medicare Population in 2016

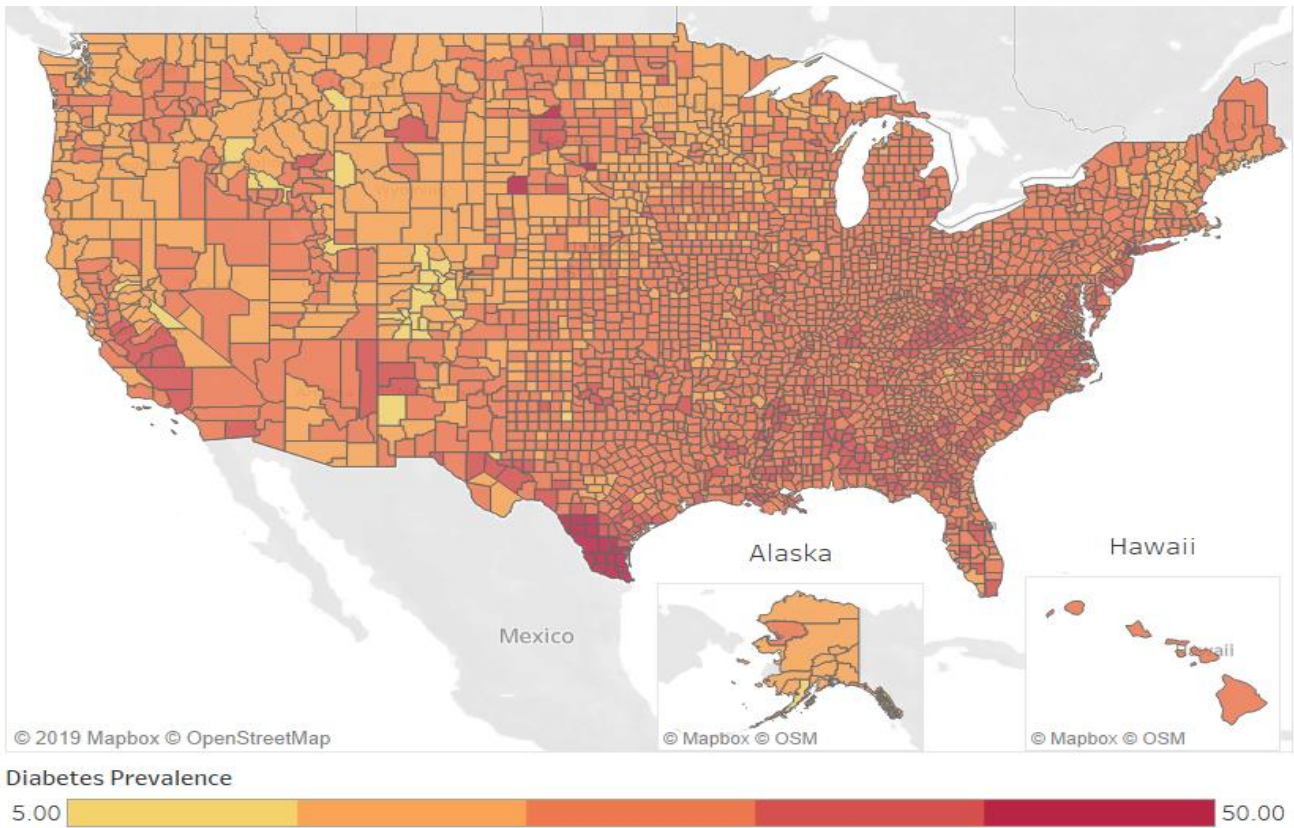


Figure 2. Chronic Kidney Disease Prevalence in the FFS Medicare Population in 2016

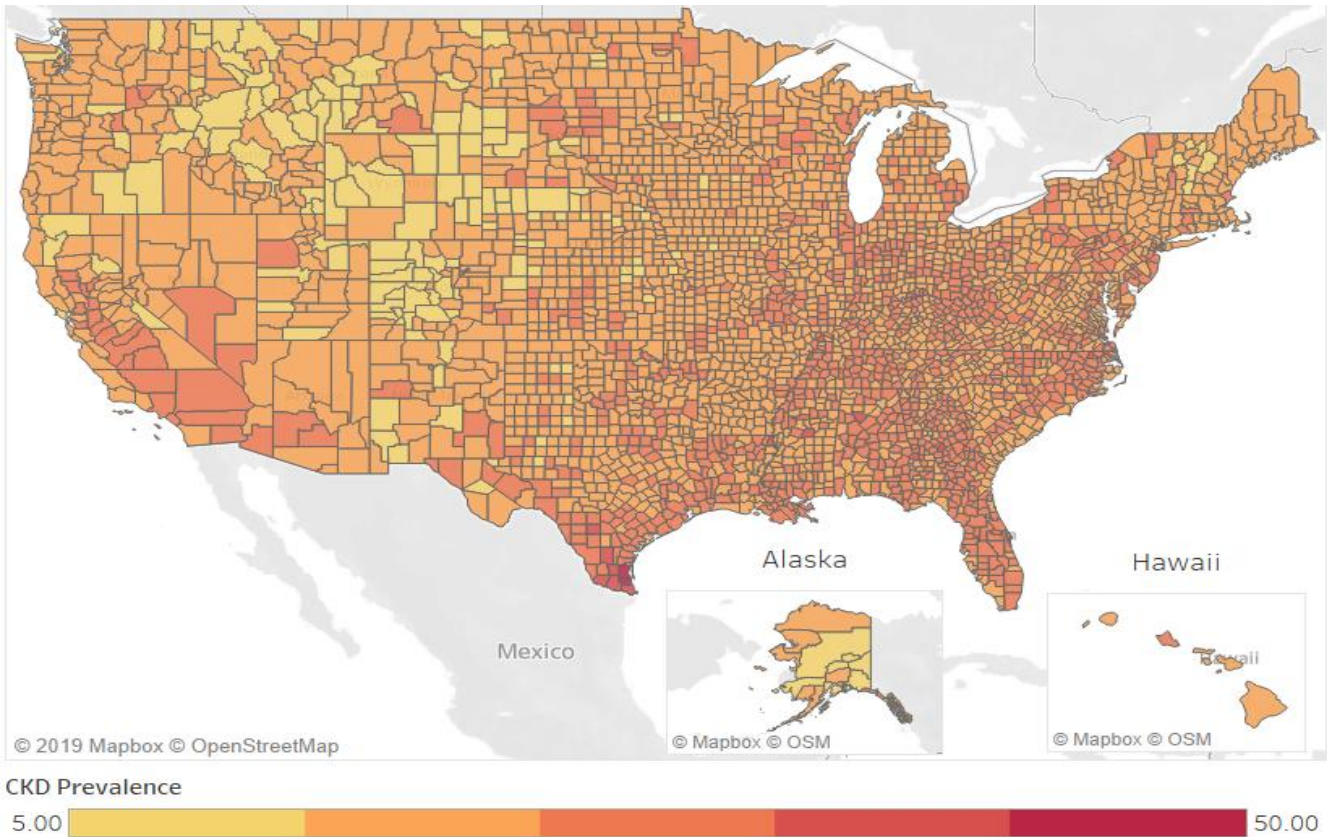
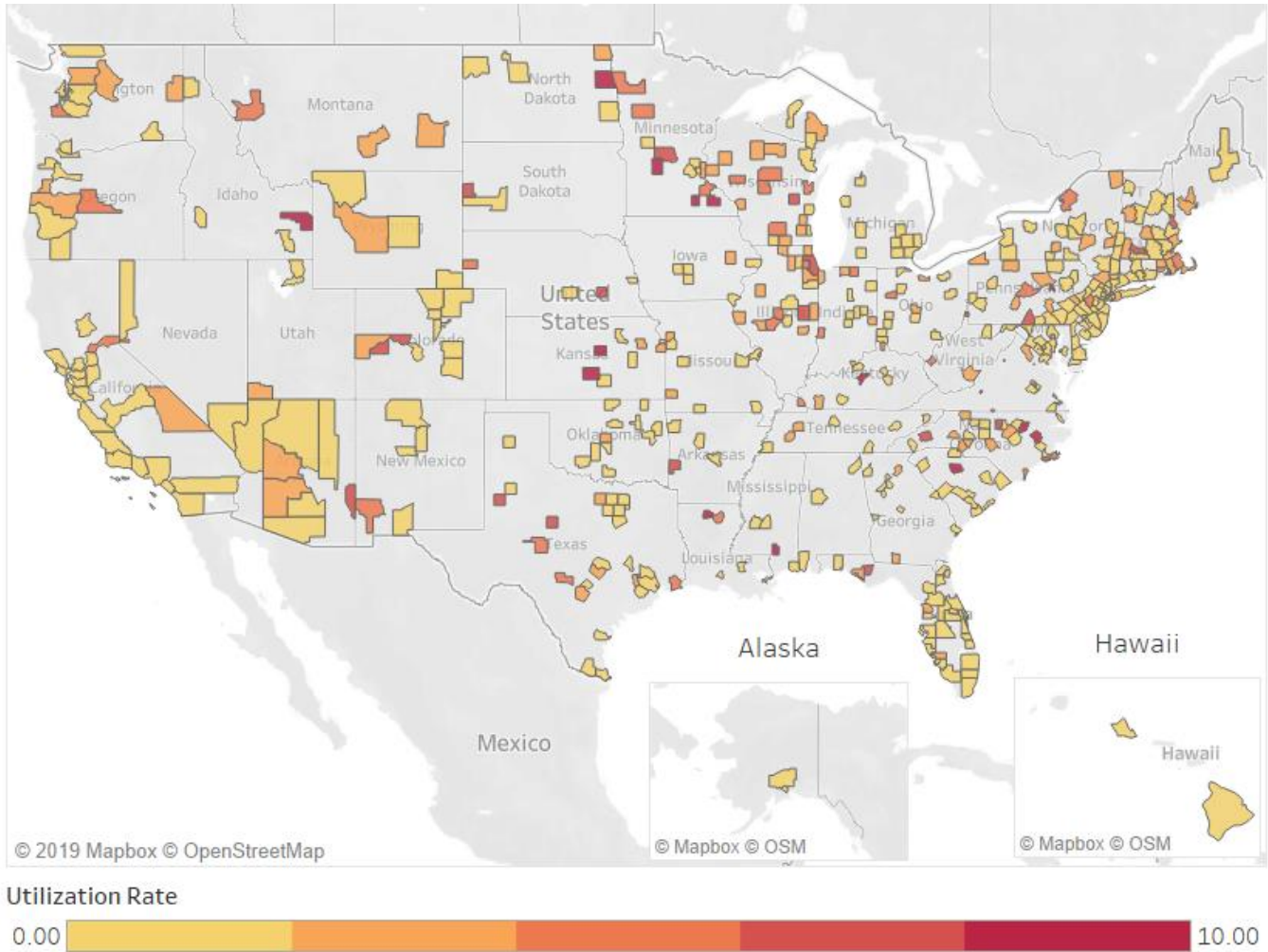


Figure 3. Utilization of MNT Services in the FFS Medicare Population in 2016



Prevalence data from a total of 3,140 counties were observed, and utilization of MNT services was observed to occur in 480 counties (Table 3). While the average prevalence of chronic kidney disease/diabetes is relatively similar across rural and urban counties, MNT services were utilized in many more urban counties (388, 80.8%) than rural (92, 19.2%). When taken in the context of the overall greater number of rural counties (1,975 compared to 1,165), the disparity is even more striking.

Table 3. County Utilization of MNT Services as Compared to Average County DM/CKD Prevalence, 2016

Category	Number of Counties	All Counties	
		Average Incidence of Diabetes	Average Incidence of CKD
Total	3,140	26.8%	21%
Urban (RUCC 1-3)	1,165	27.1%	22.2%
Rural (RUCC 4-9)	1,975	26.6%	20.2%
Counties Utilizing MNT			
Total	480	26.2%	21.8%
Urban (RUCC 1-3)	388	26.5%	22.3%
Rural (RUCC 4-9)	92	25.3%	19.8%
Counties without MNT Utilization			
Total	2,660	26.9%	20.9%
Urban (RUCC 1-3)	777	27.4%	22.2%
Rural (RUCC 4-9)	1,883	26.7%	20.2%

Conclusion/Discussion

Based upon the observed patterns of MNT utilization, significant differences exist between rural and urban utilization. In counties where MNT services are utilized, utilization rates are higher in rural counties as compared to urban counties. However, utilization of MNT services occurs in far fewer rural counties than urban counties, and it occurs in lesser amounts per beneficiary as compared to urban utilization. The lack of utilization in rural counties cannot be explained by lower disease incidence and is not proportional to the rural segment of the FFS Medicare population. Low utilization in rural areas may be explained by a lack of rural access, or rural beneficiaries traveling to urban locations for treatment; however, these conditions could not be examined. Regardless of etiology, the lower utilization of MNT services in rural counties may lead to an outcome disparity as compared to urban counties. Finding methods to provide more MNT services to rural populations, via innovative health care organization structure or technology, may be key in addressing this observed disparity.

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