

O N L I N E A P P E N D I X E S

**Regional Variation in
Medicare Service Use**

O N L I N E A P P E N D I X

A

**Comparison of results from
CMS Office of the Actuary data and
Beneficiary Annual Summary File**

Our current analysis differs from our previous work in which we used county-level program spending from the CMS Office of the Actuary (OACT) (Medicare Payment Advisory Commission 2009). In addition to using the Beneficiary Annual Summary File (BASF) as our data source, we use a regression-based method to make the health status and demographic adjustments to the BASF data, whereas we used arithmetic techniques to adjust the OACT data.

Our analysis of these two data sources results in very little difference in the measured amount of variation. For example, under both the OACT county-level data and the BASF beneficiary-level data, per capita service use is about 30 percent higher for the region at the 90th percentile compared with the region at the 10th percentile

Although we find similar variation with the two data sources, we believe the BASF is superior to the OACT data for three reasons. First, the beneficiary-level structure of the BASF allows us to adjust for health status at the individual level rather than at the aggregate county-level using the OACT file. Second, the BASF allows us to analyze variation among subgroups of beneficiaries. Third, the BASF has data for seven provider categories: hospital inpatient, skilled nursing facility, hospital outpatient, carrier (which includes physician, ambulatory surgical centers, and labs), home health agencies, durable medical equipment, and hospice.¹ In contrast, the OACT has spending separated into only two categories: Part A and Part B. The greater disaggregation in the BASF allows us to do more detailed analysis of the sources of regional variation.

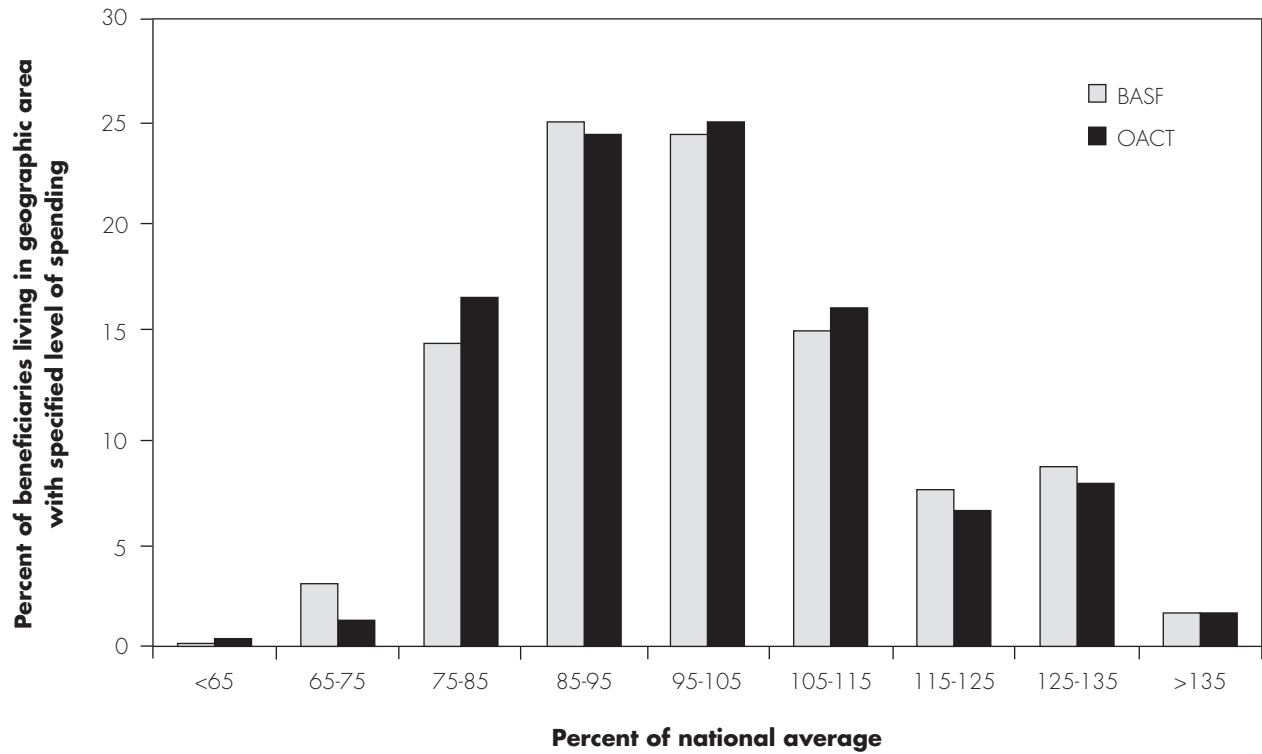
For purposes of presentation, we aggregate the data in each data set to metropolitan statistical areas for urban areas and rest-of-state nonmetropolitan areas for nonurban areas. This aggregation resulted in 409 regions.² We then weight each region by its population in fee-for-service Medicare. We averaged 3 years of data (2005, 2006, and 2007 for the OACT file and 2006, 2007, and 2008 for the BASF file) to minimize any instability caused by areas with very few beneficiaries.

We graphed the distribution of per capita unadjusted spending (Figure A-1, p. 6) for both data sets. We find similar distributions for both data sets. For example, the correlation coefficient between the level of raw spending in the OACT data and the level of raw spending in the BASF data is 0.98.

Regional variation in service use with the two data sources is very similar as well. We found that under the OACT file per capita service use was 29 percent higher in the region at the 90th percentile of the distribution compared with the region at the 10th percentile. Under the BASF file, per capita service use in the region at the 90th percentile was 30 percent higher compared with the region at the 10th percentile. In addition, the correlation coefficient for service use is 0.95 between the two data sources. ■

Figure A-1

Distribution of spending is similar between data sets



Note: BASF (Beneficiary Annual Summary File), OACT (Office of the Actuary, CMS). Spending is per capita Medicare spending among fee-for-service beneficiaries in each area. Areas are defined as metropolitan statistical areas for urban counties and rest-of-state nonmetropolitan areas for nonurban counties.

Source: MedPAC analysis of 2005–2007 county-level Medicare spending in each county, 2006–2008 beneficiary-level Medicare spending from the Beneficiary Annual Summary File, and Medicare inpatient claims.

References: Appendix A

Medicare Payment Advisory Commission. 2009. *Report to the Congress: Measuring regional variation in service use*. Washington, DC: MedPAC.

Endnotes: Appendix A

- 1 We use the Medicare Provider Analysis and Review file to disaggregate the inpatient spending to inpatient rehabilitation, inpatient psychiatric, and all other inpatient. This procedure gives us 10 payment sectors.
- 2 In our analysis of the OACT file, we use other data sources from CMS to estimate fee-for-service enrollment in each county. However, these data sources have different county definitions for the state of Alaska than the OACT file. Therefore, we combined the two metropolitan statistical areas in Alaska (Anchorage and Fairbanks) with the nonmetropolitan rest-of-state area in Alaska to create a region defined by the whole state.

ONLINE APPENDIX

B

**Relative Medicare service use
by geographic area**

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
AK	Alaska	
AK	AK, entire state	87%
AL	Alabama	
AL	AL, nonmetro areas	110
AL	Anniston-Oxford, AL, MSA	113
AL	Auburn-Opelika, AL, MSA	100
AL	Birmingham-Hoover, AL, MSA	109
AL	Decatur, AL, MSA	108
AL	Dothan, AL, MSA	105
AL	Florence-Muscle Shoals, AL, MSA	106
AL	Gadsden, AL, MSA	117
AL	Huntsville, AL, MSA	104
AL	Mobile, AL, MSA	111
AL	Montgomery, AL, MSA	112
AL	Tuscaloosa, AL, MSA	112
AR	Arkansas	
AR	AR, nonmetro areas	104
AR	Fayetteville-Springdale-Rogers, AR, MSA	99
AR	Fort Smith, AR-OK, MSA	103
AR	Hot Springs, AR, MSA	106
AR	Jonesboro, AR, MSA	102
AR	Little Rock-North Little Rock-Conway, AR, MSA	106
AR	Pine Bluff, AR, MSA	97
AZ	Arizona	
AZ	AZ, nonmetro areas	94
AZ	Flagstaff, AZ, MSA	91
AZ	Lake Havasu City-Kingman, AZ, MSA	98
AZ	Phoenix-Mesa-Scottsdale, AZ, MSA	104
AZ	Prescott, AZ, MSA	92
AZ	Tucson, AZ, MSA	100
AZ	Yuma, AZ, MSA	86

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
CA	California	
CA	CA, nonmetro areas	87
CA	Bakersfield, CA, MSA	93
CA	Chico, CA, MSA	90
CA	El Centro, CA, MSA	86
CA	Fresno, CA, MSA	89
CA	Hanford-Corcoran, CA, MSA	86
CA	Los Angeles-Long Beach-Santa Ana, CA	102
CA	Madera, CA, MSA	82
CA	Merced, CA, MSA	84
CA	Modesto, CA, MSA	86
CA	Napa, CA, MSA	87
CA	Oxnard-Thousand Oaks-Ventura, CA, MSA	95
CA	Redding, CA, MSA	95
CA	Riverside-San Bernardino-Ontario, CA, MSA	96
CA	Sacramento-Arden-Arcade-Roseville, CA, MSA	82
CA	Salinas, CA, MSA	95
CA	San Diego-Carlsbad-San Marcos, CA, MSA	93
CA	San Francisco-Oakland-Fremont, CA, MSA	85
CA	San Jose-Sunnyvale-Santa Clara, CA, MSA	84
CA	San Luis Obispo-Paso Robles, CA, MSA	90
CA	Santa Barbara-Santa Maria-Goleta, CA, MSA	83
CA	Santa Cruz-Watsonville, CA, MSA	83
CA	Santa Rosa-Petaluma, CA, MSA	83
CA	Stockton, CA, MSA	84
CA	Vallejo-Fairfield, CA, MSA	87
CA	Visalia-Porterville, CA, MSA	87
CA	Yuba City, CA, MSA	83
CO	Colorado	
CO	CO, nonmetro areas	89
CO	Boulder, CO, MSA	101
CO	Colorado Springs, CO, MSA	97

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
CO	Denver-Aurora, CO, MSA	95
CO	Fort Collins-Loveland, CO, MSA	93
CO	Grand Junction, CO, MSA	84
CO	Greeley, CO, MSA	96
CO	Pueblo, CO, MSA	88
CT	Connecticut	
CT	CT, nonmetro areas	91
CT	Bridgeport-Stamford-Norwalk, CT, MSA	96
CT	Hartford-West Hartford-East Hartford, CT, MSA	93
CT	New Haven-Milford, CT, MSA	96
CT	Norwich-New London, CT, MSA	90
DC	District of Columbia	
DC	Washington-Arlington-Alexandria, DC-VA-MD-WV, MSA	93
DE	Delaware	
DE	DE, nonmetro areas	94
DE	Dover, DE, MSA	95
FL	Florida	
FL	FL, nonmetro areas	106
FL	Cape Coral-Fort Myers, FL, MSA	110
FL	Deltona-Daytona Beach-Ormond Beach, FL, MSA	105
FL	Fort Walton Beach-Crestview-Destin, FL, MSA	105
FL	Gainesville, FL, MSA	100
FL	Jacksonville, FL, MSA	114
FL	Lakeland, FL, MSA	109
FL	Miami-Fort Lauderdale-Pompano Beach, FL, MSA	140
FL	Naples-Marco Island, FL, MSA	105
FL	Ocala, FL, MSA	104
FL	Orlando-Kissimmee, FL, MSA	111
FL	Palm Bay-Melbourne-Titusville, FL, MSA	108
FL	Palm Coast, FL, MSA	104
FL	Panama City-Lynn Haven, FL, MSA	108
FL	Pensacola-Ferry Pass-Brent, FL, MSA	104

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
FL	Port St. Lucie, FL, MSA	109
FL	Punta Gorda, FL, MSA	108
FL	Sarasota-Bradenton-Venice, FL, MSA	106
FL	Sebastian-Vero Beach, FL, MSA	103
FL	Tallahassee, FL, MSA	101
FL	Tampa-St. Petersburg-Clearwater, FL, MSA	112
GA	Georgia	
GA	GA, nonmetro areas	99
GA	Albany, GA, MSA	91
GA	Athens-Clarke County, GA, MSA	92
GA	Atlanta-Sandy Springs-Marietta, GA, MSA	101
GA	Augusta-Richmond County, GA-SC, MSA	98
GA	Brunswick, GA, MSA	94
GA	Columbus, GA-AL, MSA	96
GA	Dalton, GA, MSA	95
GA	Gainesville, GA, MSA	95
GA	Hinesville-Fort Stewart, GA, MSA	100
GA	Macon, GA, MSA	104
GA	Rome, GA, MSA	97
GA	Savannah, GA, MSA	103
GA	Valdosta, GA, MSA	91
GA	Warner Robins, GA, MSA	105
HI	Hawaii	
HI	HI, nonmetro areas	75
HI	Honolulu, HI, MSA	76
IA	Iowa	
IA	IA, nonmetro areas	87
IA	Ames, IA, MSA	84
IA	Cedar Rapids, IA, MSA	90
IA	Davenport-Moline-Rock Island, IA-IL, MSA	97
IA	Des Moines-West Des Moines, IA, MSA	89
IA	Dubuque, IA, MSA	86

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
IA	Iowa City, IA, MSA	84
IA	Sioux City, IA-NE-SD, MSA	90
IA	Waterloo-Cedar Falls, IA, MSA	91
ID	Idaho	
ID	ID, nonmetro areas	93
ID	Boise City-Nampa, ID, MSA	91
ID	Coeur d'Alene, ID, MSA	89
ID	Idaho Falls, ID, MSA	94
ID	Lewiston, ID-WA, MSA	83
ID	Pocatello, ID, MSA	93
IL	Illinois	
IL	IL, nonmetro areas	97
IL	Bloomington-Normal, IL, MSA	91
IL	Champaign-Urbana, IL, MSA	90
IL	Chicago-Naperville-Joliet, IL-IN-WI, MSA	107
IL	Danville, IL, MSA	96
IL	Decatur, IL, MSA	94
IL	Kankakee-Bradley, IL, MSA	103
IL	Peoria, IL, MSA	94
IL	Rockford, IL, MSA	98
IL	Springfield, IL, MSA	94
IN	Indiana	
IN	IN, nonmetro areas	94
IN	Anderson, IN, MSA	99
IN	Bloomington, IN, MSA	96
IN	Columbus, IN, MSA	95
IN	Elkhart-Goshen, IN, MSA	95
IN	Evansville, IN-KY, MSA	102
IN	Fort Wayne, IN, MSA	92
IN	Indianapolis-Carmel, IN, MSA	101
IN	Kokomo, IN, MSA	107
IN	Lafayette, IN, MSA	97

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
IN	Michigan City-La Porte, IN, MSA	98
IN	Muncie, IN, MSA	96
IN	South Bend-Mishawaka, IN-MI, MSA	96
IN	Terre Haute, IN, MSA	105
KS	Kansas	
KS	KS, nonmetro areas	101
KS	Lawrence, KS, MSA	95
KS	Topeka, KS, MSA	99
KS	Wichita, KS, MSA	99
KY	Kentucky	
KY	KY, nonmetro areas	101
KY	Bowling Green, KY, MSA	103
KY	Elizabethtown, KY, MSA	94
KY	Lexington-Fayette, KY, MSA	99
KY	Louisville-Jefferson County, KY, MSA	100
KY	Owensboro, KY, MSA	97
LA	Louisiana	
LA	LA, nonmetro areas	129
LA	Alexandria, LA, MSA	122
LA	Baton Rouge, LA, MSA	118
LA	Houma-Bayou Cane-Thibodaux, LA, MSA	108
LA	Lafayette, LA, MSA	119
LA	Lake Charles, LA, MSA	117
LA	Monroe, LA, MSA	130
LA	New Orleans-Metairie-Kenner, LA, MSA	113
LA	Shreveport-Bossier City, LA, MSA	122
MA	Massachusetts	
MA	MA, nonmetro areas	100
MA	Barnstable Town, MA, MSA	98
MA	Boston-Cambridge-Quincy, MA-NH, MSA	100
MA	Pittsfield, MA, MSA	96
MA	Springfield, MA, MSA	92

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
MA	Worcester, MA, MSA	98
MD	Maryland	
MD	MD, nonmetro areas	97
MD	Baltimore-Towson, MD, MSA	99
MD	Cumberland, MD-WV, MSA	93
MD	Hagerstown-Martinsburg, MD-WV, MSA	92
MD	Salisbury, MD, MSA	97
ME	Maine	
ME	ME, nonmetro areas	91
ME	Bangor, ME, MSA	96
ME	Lewiston-Auburn, ME, MSA	92
ME	Portland-South Portland-Biddeford, ME, MSA	91
MI	Michigan	
MI	MI, nonmetro areas	95
MI	Ann Arbor, MI, MSA	100
MI	Battle Creek, MI, MSA	101
MI	Bay City, MI, MSA	109
MI	Detroit-Warren-Livonia, MI, MSA	108
MI	Flint, MI, MSA	103
MI	Grand Rapids-Wyoming, MI, MSA	96
MI	Holland-Grand Haven, MI, MSA	93
MI	Jackson, MI, MSA	100
MI	Kalamazoo-Portage, MI, MSA	97
MI	Lansing-East Lansing, MI, MSA	101
MI	Monroe, MI, MSA	99
MI	Muskegon-Norton Shores, MI, MSA	95
MI	Niles-Benton Harbor, MI, MSA	100
MI	Saginaw-Saginaw Township North, MI, MSA	105
MN	Minnesota	
MN	MN, nonmetro areas	90
MN	Duluth, MN-WI, MSA	92
MN	Minneapolis-St. Paul-Bloomington, MN-WI, MSA	93

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
MN	Rochester, MN, MSA	90
MN	St. Cloud, MN, MSA	88
MO	Missouri	
MO	MO, nonmetro areas	99
MO	Columbia, MO, MSA	94
MO	Jefferson City, MO, MSA	99
MO	Joplin, MO, MSA	94
MO	Kansas City, MO-KS, MSA	102
MO	St. Joseph, MO-KS, MSA	103
MO	St. Louis, MO-IL, MSA	101
MO	Springfield, MO, MSA	94
MS	Mississippi	
MS	MS, nonmetro areas	115
MS	Gulfport-Biloxi, MS, MSA	116
MS	Hattiesburg, MS, MSA	115
MS	Jackson, MS, MSA	116
MS	Pascagoula, MS, MSA	119
MT	Montana	
MT	MT, nonmetro areas	90
MT	Billings, MT, MSA	96
MT	Great Falls, MT, MSA	94
MT	Missoula, MT, MSA	94
NC	North Carolina	
NC	NC, nonmetro areas	99
NC	Asheville, NC, MSA	96
NC	Burlington, NC, MSA	98
NC	Charlotte-Gastonia-Concord, NC-SC, MSA	100
NC	Durham, NC, MSA	97
NC	Fayetteville, NC, MSA	102
NC	Goldsboro, NC, MSA	102
NC	Greensboro-High Point, NC, MSA	96
NC	Greenville, NC, MSA	100

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
NC	Hickory-Lenoir-Morganton, NC, MSA	100
NC	Jacksonville, NC, MSA	100
NC	Raleigh-Cary, NC, MSA	100
NC	Rocky Mount, NC, MSA	100
NC	Wilmington, NC, MSA	101
NC	Winston-Salem, NC, MSA	103
ND	North Dakota	
ND	ND, nonmetro areas	88
ND	Bismarck, ND, MSA	87
ND	Fargo, ND-MN, MSA	88
ND	Grand Forks, ND-MN, MSA	93
NE	Nebraska	
NE	NE, nonmetro areas	91
NE	Lincoln, NE, MSA	96
NE	Omaha-Council Bluffs, NE-IA, MSA	101
NH	New Hampshire	
NH	NH, nonmetro areas	87
NH	Manchester-Nashua, NH, MSA	91
NJ	New Jersey	
NJ	Atlantic City, NJ, MSA	97
NJ	Ocean City, NJ, MSA	97
NJ	Trenton-Ewing, NJ, MSA	99
NJ	Vineland-Millville-Bridgeton, NJ, MSA	87
NM	New Mexico	
NM	NM, nonmetro areas	88
NM	Albuquerque, NM, MSA	86
NM	Farmington, NM, MSA	87
NM	Las Cruces, NM, MSA	92
NM	Santa Fe, NM, MSA	89
NV	Nevada	
NV	NV, nonmetro areas	97
NV	Carson City, NV, MSA	94

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
NV	Las Vegas-Paradise, NV, MSA	113
NV	Reno-Sparks, NV, MSA	95
NY	New York	
NY	NY, nonmetro areas	84
NY	Albany-Schenectady-Troy, NY, MSA	85
NY	Binghamton, NY, MSA	85
NY	Buffalo-Niagara Falls, NY, MSA	88
NY	Elmira, NY, MSA	79
NY	Glens Falls, NY, MSA	83
NY	Ithaca, NY, MSA	81
NY	Kingston, NY, MSA	89
NY	New York-Northern New Jersey-Long Island, NY-NJ-PA, MSA	95
NY	Poughkeepsie-Newburgh-Middletown, NY, MSA	92
NY	Rochester, NY, MSA	83
NY	Syracuse, NY, MSA	86
NY	Utica-Rome, NY, MSA	87
OH	Ohio	
OH	OH, nonmetro areas	98
OH	Akron, OH, MSA	100
OH	Canton-Massillon, OH, MSA	98
OH	Cincinnati-Middletown, OH-KY-IN, MSA	101
OH	Cleveland-Elyria-Mentor, OH, MSA	100
OH	Columbus, OH, MSA	101
OH	Dayton, OH, MSA	102
OH	Lima, OH, MSA	105
OH	Mansfield, OH, MSA	98
OH	Sandusky, OH, MSA	103
OH	Springfield, OH, MSA	96
OH	Toledo, OH, MSA	101
OH	Youngstown-Warren-Boardman, OH-PA, MSA	100
OK	Oklahoma	
OK	OK, nonmetro areas	115

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
OK	Lawton, OK, MSA	100
OK	Oklahoma City, OK, MSA	116
OK	Tulsa, OK, MSA	117
OR	Oregon	
OR	OR, nonmetro areas	86
OR	Bend, OR, MSA	92
OR	Corvallis, OR, MSA	84
OR	Eugene-Springfield, OR, MSA	86
OR	Medford, OR, MSA	84
OR	Portland-Vancouver-Beaverton, OR-WA, MSA	85
OR	Salem, OR, MSA	87
PA	Pennsylvania	
PA	PA, nonmetro areas	95
PA	Allentown-Bethlehem-Easton, PA-NJ, MSA	96
PA	Altoona, PA, MSA	94
PA	Erie, PA, MSA	90
PA	Harrisburg-Carlisle, PA, MSA	100
PA	Johnstown, PA, MSA	99
PA	Lancaster, PA, MSA	89
PA	Lebanon, PA, MSA	85
PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD, MSA	98
PA	Pittsburgh, PA, MSA	107
PA	Reading, PA, MSA	95
PA	Scranton-Wilkes-Barre, PA, MSA	101
PA	State College, PA, MSA	90
PA	Williamsport, PA, MSA	81
PA	York-Hanover, PA, MSA	94
RI	Rhode Island	
RI	Providence-New Bedford-Fall River, RI-MA, MSA	93
SC	South Carolina	
SC	SC, nonmetro areas	102
SC	Anderson, SC, MSA	100

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
SC	Charleston-North Charleston, SC, MSA	105
SC	Columbia, SC, MSA	106
SC	Florence, SC, MSA	105
SC	Greenville-Mauldin-Easley, SC, MSA	98
SC	Myrtle Beach-Conway-North Myrtle Beach, SC, MSA	102
SC	Spartanburg, SC, MSA	97
SC	Sumter, SC, MSA	95
SD	South Dakota	
SD	SD, nonmetro areas	88
SD	Rapid City, SD, MSA	89
SD	Sioux Falls, SD, MSA	92
TN	Tennessee	
TN	TN, nonmetro areas	105
TN	Chattanooga, TN-GA, MSA	106
TN	Clarksville, TN-KY, MSA	103
TN	Cleveland, TN, MSA	100
TN	Jackson, TN, MSA	96
TN	Johnson City, TN, MSA	104
TN	Kingsport-Bristol-Bristol, TN-VA, MSA	99
TN	Knoxville, TN, MSA	100
TN	Memphis, TN-MS-AR, MSA	108
TN	Morristown, TN, MSA	102
TN	Nashville-Davidson-Murfreesboro-Franklin, TN, MSA	105
TX	Texas	
TX	TX, nonmetro areas	114
TX	Abilene, TX, MSA	107
TX	Amarillo, TX, MSA	114
TX	Austin-Round Rock, TX, MSA	108
TX	Beaumont-Port Arthur, TX, MSA	118
TX	Brownsville-Harlingen, TX, MSA	115
TX	College Station-Bryan, TX, MSA	107
TX	Corpus Christi, TX, MSA	113

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
TX	Dallas-Fort Worth-Arlington, TX, MSA	119
TX	El Paso, TX, MSA	95
TX	Houston-Sugar Land-Baytown, TX, MSA	125
TX	Killeen-Temple-Fort Hood, TX, MSA	95
TX	Laredo, TX, MSA	117
TX	Longview, TX, MSA	116
TX	Lubbock, TX, MSA	125
TX	McAllen-Edinburg-Mission, TX, MSA	138
TX	Midland, TX, MSA	112
TX	Odessa, TX, MSA	118
TX	San Angelo, TX, MSA	106
TX	San Antonio, TX, MSA	110
TX	Sherman-Denison, TX, MSA	112
TX	Texarkana, TX-Texarkana, AR, MSA	113
TX	Tyler, TX, MSA	119
TX	Victoria, TX, MSA	117
TX	Waco, TX, MSA	101
TX	Wichita Falls, TX, MSA	109
UT	Utah	
UT	UT, nonmetro areas	92
UT	Logan, UT-ID, MSA	93
UT	Ogden-Clearfield, UT, MSA	95
UT	Provo-Orem, UT, MSA	100
UT	St. George, UT, MSA	97
UT	Salt Lake City, UT, MSA	95
VA	Virginia	
VA	VA, nonmetro areas	92
VA	Blacksburg-Christiansburg-Radford, VA, MSA	92
VA	Charlottesville, VA, MSA	88
VA	Danville, VA, MSA	84
VA	Harrisonburg, VA, MSA	83
VA	Lynchburg, VA, MSA	93

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
VA	Richmond, VA, MSA	97
VA	Roanoke, VA, MSA	92
VA	Virginia Beach-Norfolk-Newport News, VA-NC, MSA	93
VA	Winchester, VA-WV, MSA	84
VT	Vermont	
VT	VT, nonmetro areas	87
VT	Burlington-South Burlington, VT, MSA	88
WA	Washington	
WA	WA, nonmetro areas	89
WA	Bellingham, WA, MSA	85
WA	Bremerton-Silverdale, WA, MSA	85
WA	Kennewick-Richland-Pasco, WA, MSA	88
WA	Longview, WA, MSA	87
WA	Mount Vernon-Anacortes, WA, MSA	94
WA	Olympia, WA, MSA	84
WA	Seattle-Tacoma-Bellevue, WA, MSA	90
WA	Spokane, WA, MSA	91
WA	Wenatchee, WA, MSA	85
WA	Yakima, WA, MSA	83
WI	Wisconsin	
WI	WI, nonmetro areas	86
WI	Appleton, WI, MSA	84
WI	Eau Claire, WI, MSA	87
WI	Fond du Lac, WI, MSA	81
WI	Green Bay, WI, MSA	93
WI	Janesville, WI, MSA	89
WI	La Crosse, WI-MN, MSA	75
WI	Madison, WI, MSA	86
WI	Milwaukee-Waukesha-West Allis, WI, MSA	99
WI	Oshkosh-Neenah, WI, MSA	86
WI	Racine, WI, MSA	97
WI	Sheboygan, WI, MSA	90

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.

Table B-1**Service use per Medicare beneficiary, by area (metropolitan statistical areas and nonmetropolitan areas) relative to the national average**

State	Area name	Service use per beneficiary as percent of national average
WI	Wausau, WI, MSA	88
WV	West Virginia	
WV	WV, nonmetro areas	92
WV	Charleston, WV, MSA	96
WV	Huntington-Ashland, WV-KY-OH, MSA	101
WV	Morgantown, WV, MSA	101
WV	Parkersburg-Marietta-Vienna, WV, MSA	103
WV	Weirton-Steubenville, WV-OH, MSA	116
WV	Wheeling, WV-OH, MSA	100
WY	Wyoming	
WY	WY, nonmetro areas	93
WY	Casper, WY, MSA	92
WY	Cheyenne, WY, MSA	97

Note: MSA (metropolitan statistical area). We collect metropolitan counties into MSAs and nonmetropolitan counties into "rest-of-state" nonmetro areas. Service use is spending adjusted for regional differences in input prices, special Medicare payments to hospitals and physicians, demographics, and health status. The service use measure for each MSA and statewide nonmetro area is the area's average service use over 2006–2008, relative to the national average.

Source: MedPAC analysis of the 2006–2008 Beneficiary Annual Summary Files and the Medicare Provider Analysis and Review files.