

This report analyzes the geography of the Minnesota physician workforce. It describes urban-rural and regional variations in the per capita supply of physicians, as well as variations in the distribution of physicians between primary care and non-primary care specialties.

A companion report, "Minnesota Physician Workforce Specialization" to be published in September 2009, will offer more detailed analysis of physician specialties.

INTRODUCTION

The geographic concentration of the state's physician workforce reflects the location of large hospitals and clinics. The geographic distribution of health care facilities and providers is similar to the geography of other professional services and specialized retail businesses. In both cases, there is a nested hierarchy of service centers, ranging from large urban centers serving large regional trade areas, down to small cities serving smaller trade areas. The large centers support highly specialized businesses, while the smaller centers support more basic services.

In general, a map of health care facilities or providers resembles a map of population. Areas with higher population densities have more facilities and providers, with a handful of metropolitan or regional centers having a disproportionate share. Large urban areas like the Twin Cities serve large regions. Medium-sized centers like Duluth and St. Cloud typically serve multi-county regions. Smaller centers like Albert Lea, Bemidji or Willmar may serve a few counties. Rochester is a special case, being a large medical center that serves not only southeastern Minnesota, but patients from around the world.

As with grocery stores or clothing stores, each kind of health care facility or provider requires some minimum-sized market to be economically viable. Basic primary care tends to be dispersed, close to where people live. Specialty clinics or physicians generally must draw patients from a larger geographic area than primary care providers to have a large enough patient base. Similarly, Level 1 or 2 trauma hospitals serve larger geographic areas than Level 3 or 4 trauma hospitals. As a result, the most specialized health care services tend to be concentrated in a few centers, and patients requiring specialty care commonly must travel farther to visit a specialist than a patient with a primary care appointment.

GEOGRAPHIC DISTRIBUTION OF PHYSICIANS: PRIMARY CARE VERSUS NON-PRIMARY CARE

Four geographic breakdowns of the state's population and physician workforce give different views of how well the distribution of physician practice sites match up with population:

- The seven-county Twin Cities area versus 80 "Greater Minnesota" counties
- A 13-county combined Twin Cities-St. Cloud area versus 74 counties in balance of state
- Metropolitan statistical area counties (21) versus micropolitan statistical area counties (20) versus rural counties (46)
- Multi-county urban and rural regions.

Because data about work status is obtained from a voluntary survey, and because some work site address information may not be precisely accurate, county-level or lower estimates of practicing physicians are subject to error. Analysis of multi-county groups or regions is more reliable. Multi-county groupings also reflect the fact that health care service markets cross county lines.

Twin Cities Metro versus Greater Minnesota

The seven Twin Cities counties in the jurisdiction of the Metropolitan Council are often compared to 80 "Greater Minnesota" counties. The seven-county metropolitan area accounts for 54 percent of the state's population and 60 percent of the state's practicing physicians. The 80 Greater Minnesota counties account for 46 percent of the state's population, but only 40 percent of all physicians.

Hennepin and Ramsey counties, each containing large hospitals and clinics, contribute heavily to the disproportionate number of physicians in the seven-county area. The five surrounding suburban counties, despite population growth and economic health, have fewer practicing physicians than their populations would suggest.

Separating primary care from non-primary care physicians changes the picture. The geographic distribution of primary care physicians matches the population pattern a bit better than the distribution of all physicians. Primary care specialties include family medicine, general internal

medicine, pediatrics, and obstetrics and gynecology. Non-primary care includes internal medicine subspecialties, surgical specialties and other specialties.

While the five suburban counties have only 12 percent of all active Minnesota physicians, they have 17 percent of the state’s primary care physicians, which is closer to the suburban counties’ 22 percent share of population. The 80 Greater Minnesota counties have 41 percent of the state’s primary care physicians.

The pattern shifts dramatically if only non-primary care specialists are considered. Hennepin and Ramsey counties, with 32 percent of the state’s population, have 54 percent of the practicing non-primary care specialists. The five suburban counties claim only 8 percent of non-primary care physicians, while the 80 Greater Minnesota counties have only 39 percent of the total.

Map 1
Twin Cities Metropolitan Council Counties

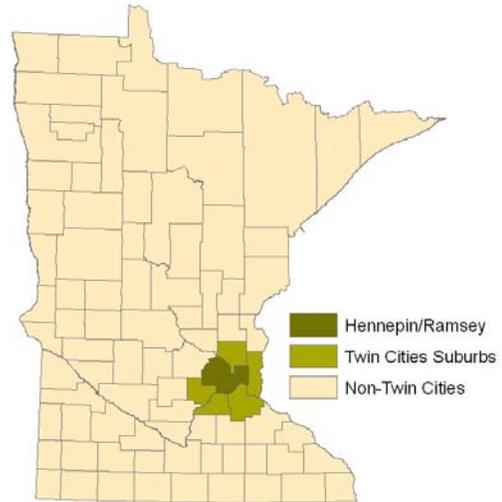
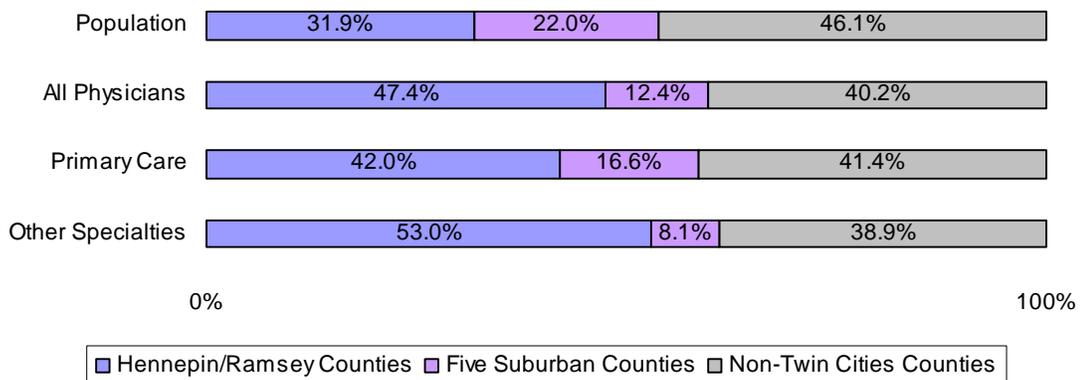


Exhibit 1

Geographic Distribution of Physicians, 2009
METROPOLITAN COUNCIL AREA AND BALANCE OF STATE

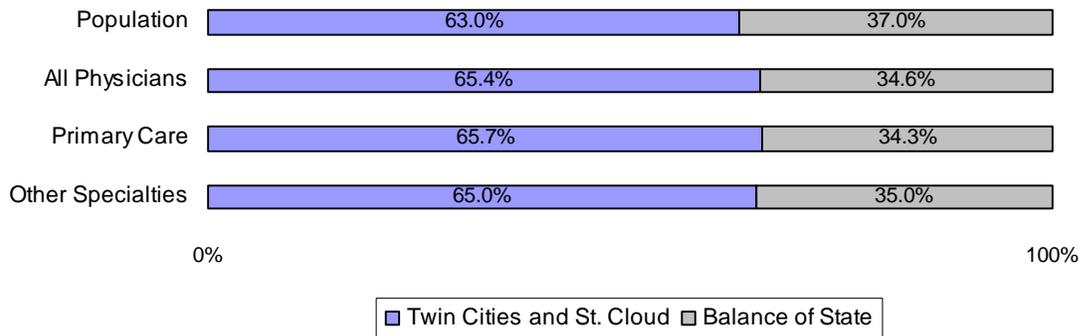


Twin Cities and St. Cloud MSAs versus Balance of State

In the past 30 years, the developed Twin Cities region has expanded well beyond the seven-county Metropolitan Council area. The federal government now designates 11 Minnesota counties as part of the Minneapolis-St. Paul-Bloomington metropolitan statistical area (MSA), which also includes two Wisconsin counties. In addition to the original seven Metropolitan Council counties, the Twin Cities MSA also includes Chisago, Isanti, Sherburne and Wright counties. The St. Cloud metropolitan statistical area comprises Benton and Stearns counties. Together, the two MSAs cover 13 Minnesota counties. While some of these counties still include rural areas, they are included in the Twin Cities and St. Cloud MSAs because they have strong economic and commuting ties with the Twin Cities and St. Cloud.

Exhibit 2

Geographic Distribution of Physicians, 2009
TWIN CITIES-ST. CLOUD AND BALANCE OF STATE



These 13 counties contain 63 percent of the state's population. Despite constituting the state's largest metropolitan region, they do not have a disproportionate share of the state's practicing physicians. The 74 counties outside the Twin Cities and St. Cloud MSAs have 35 percent of the state's physicians, almost matching their 37 percent share of population. The non-Twin Cities/St. Cloud counties fare almost equally in their share of both primary and non-primary care physicians.

Map 2
Minneapolis-St. Paul and St. Cloud
Metropolitan Statistical Areas



The 74 non-Twin Cities/St. Cloud counties are not all rural. Olmsted County hosts one of the state’s largest medical centers – Rochester – which bolsters physician numbers for the non-Twin Cities/St. Cloud counties. Other regional centers such as Duluth and Mankato also contribute to the non-Twin Cities/St. Cloud share of physicians.

Because this 74-county grouping is so diverse, it obscures a great deal of variation. To get a better look at this variation, the next two sections present two other ways of looking at the geographic distribution of physicians: a) metropolitan, micropolitan and rural counties, and b) comparison of multi-county geographic regions.

MSA versus Micropolitan versus Rural

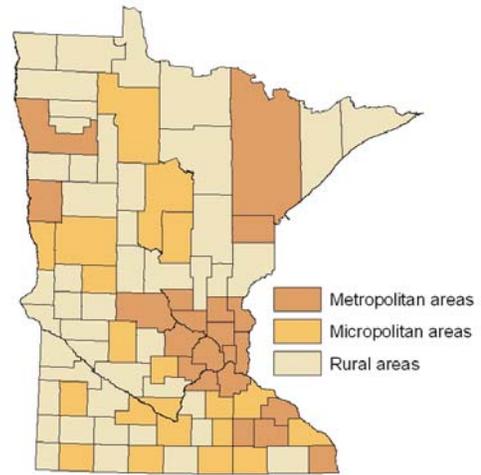
The two breakdowns just discussed are simple geographic groupings based on the idea that counties in the state’s major metropolitan corridor might be economically different from counties farther from the Twin Cities and St. Cloud. The federal government’s definition of metropolitan and micropolitan areas can be used to categorize counties based more on urban status than geography.

Minnesota has 21 metropolitan counties in seven metropolitan statistical areas:

- Minneapolis-St. Paul-Bloomington (Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Sherburne, Washington and Wright counties in Minnesota and Pierce and St. Croix counties in Wisconsin)
- St. Cloud (Benton and Stearns counties)
- Rochester (Dodge, Olmsted and Wabasha counties)
- Duluth-Superior (Carlton and St. Louis counties, plus Douglas County in Wisconsin)
- Fargo (Clay County in Minnesota and Cass County in North Dakota)
- Grand Forks (Polk County in Minnesota and Grand Forks County in North Dakota) and
- La Crosse (Houston County in Minnesota and La Crosse County in Wisconsin).

Generally, metropolitan statistical areas have a core city of at least 50,000. A second tier of urban areas are called micropolitan statistical areas. These are generally one- or two-county areas centered on a city of at least 10,000. Minnesota has 20 micropolitan areas; these cities are typically trade centers serving surrounding counties. Just as they are more likely than smaller communities to have specialized retail and professional services, they are also more likely to have medium-sized clinics and hospitals.

Map 3
Metropolitan, Micropolitan and Rural Counties



For purposes of this analysis, the other 46 Minnesota counties are considered rural. They do not have a city reaching the 10,000 population threshold, and are less likely to have specialized medical care. Their residents often must drive to a larger nearby community for some of their health care services.

This breakdown shows a different pattern than the simple two-way geographic breakdowns presented earlier. The more populous, economically diverse metropolitan area counties have more physicians than their population would suggest. Metropolitan counties account for 73 percent of the state's population, but 82 percent of the state's practicing physicians. Both micropolitan and rural counties have less than their proportional share of physicians.

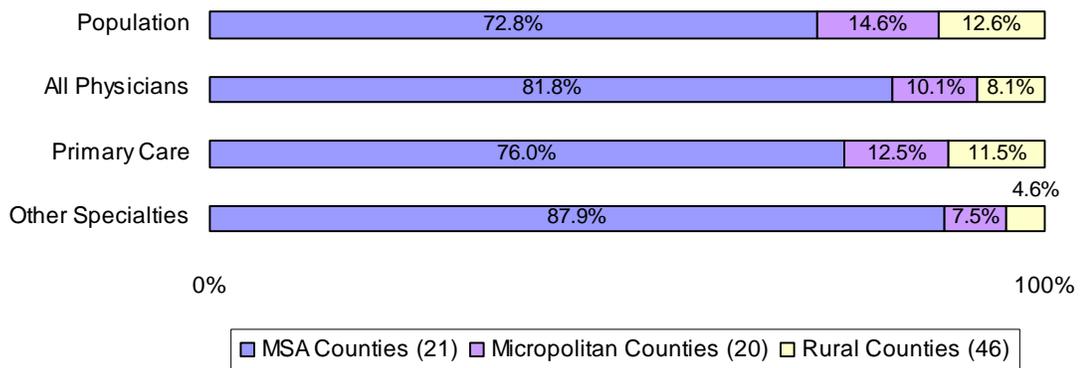
This disparity between metropolitan areas and other areas is greater for non-primary care specialists. Primary care specialists are distributed among metropolitan, micropolitan and rural areas in rough proportion to population, but non-primary care specialists are not. Counties in metropolitan areas claim 88 percent of all non-primary care specialists. Both micropolitan and rural areas have far less than their shares of population would suggest.

While this breakdown has the advantage of placing Duluth, Rochester and St. Cloud in the same category as the Twin Cities, it treats mostly rural parts of large counties such as Polk, St. Louis and

Stearns as metropolitan. The La Crosse, Wisconsin MSA includes Minnesota’s Houston County, which while only a couple of miles across a bridge from La Crosse, is a predominately rural county. If the more rural parts of these counties were excluded from the metropolitan county data, the gap between metropolitan and other areas would grow.

Exhibit 3

**Geographic Distribution of Physicians, 2009
Metropolitan, Micropolitan and Rural Counties**



Urban and Rural Regions

The metropolitan-micropolitan-rural breakdown showed how physician practice sites are concentrated in larger urban centers. Another approach is to compare geographic regions. These groupings reflect the regional nature of health care markets. This section compares 11 multi-county regions (Map 4).

The analysis examines multi-county areas around Duluth, Mankato, Minneapolis-St. Paul, Rochester, St. Cloud and Willmar, as well as regional groupings of counties in north central, northeast, northwest, southwest and west central Minnesota. A separate regional center analysis was not done for the area around Moorhead because Fargo, North Dakota



is the major health care center for that area. Several smaller Minnesota communities serve west central Minnesota, but no one is dominant. Some counties could be reasonably be assigned to either of two different regions. For example, based on distance, Wright County could be assigned to either the St. Cloud or Twin Cities areas, but is assigned to St. Cloud in this analysis.

**Exhibit 4
Population and Physicians by Urban and Rural Region**

	Population	Active Physicians	Primary Care	Non-primary Care
Twin Cities Area	55.6%	61.0%	60.1% 61.7%	
St. Cloud Area	7.3%	4.4%	5.5%	3.3%
Southeast MN	9.3%	18.4%	12.5% 24.5%	
Olmsted County	2.6%	15.3%	8.4%	22.4%
Other SE MN	6.7%	3.1%	4.1%	2.1%
Northeast MN	5.3%	4.5%	5.5% 3.6%	
Duluth Area	3.0%	3.6%	4.0%	3.3%
Range Area	1.4%	.6%	.9%	.3%
Other NE MN	.9%	.3%	.6%	*
Mankato Area	3.2%	2.8%	3.1% 2.6%	
Willmar Area	2.7%	1.7%	2.6%	.8%
Southwest MN	3.8%	1.5%	2.4%	.5%
West Central MN	4.5%	1.9%	2.7%	1.1%
Northwest MN	1.6%	.7%	1.1% .2%	
North Central MN	6.7%	3.1%	4.5%	1.7%

* less than .5%.

The Twin Cities area and southeastern Minnesota have more physicians than their populations would suggest. Most of the rest of the state has fewer physicians than population would suggest, especially non-primary care specialists.

Twin Cities Area. The seven-county Twin Cities area has 56 percent of the state’s population, but 61 percent of the state’s physicians. As shown earlier, Twin Cities’ physicians are disproportionately concentrated in Hennepin and Ramsey counties.

St. Cloud Area. Despite being a significant regional medical center, a three-county area around St. Cloud has only 4 percent of the state’s physicians, compared to 7 percent of the state’s population. The St. Cloud area fares better in primary care than non-primary care. St. Cloud’s impact as a regional health care center is affected by its proximity to the Twin Cities.

Southeastern Minnesota. Southeastern Minnesota is the state's most physician-rich region. However, Olmsted County (including Rochester) accounts for more than 80 percent of the physicians in the 11-county region. This region, which includes Albert Lea, Austin, Owatonna, Rochester and Winona, has 9 percent of the state's population, but 13 percent of the state's practicing primary care physicians and 25 percent of the state's non-primary care specialists. Without Olmsted County, the other 10 counties account for 7 percent of the state's population, but only 3 percent of the state's physicians.

Northeastern Minnesota. The region stretching from Pine County in the south to Cook County in the far northeast, has close to its population-based share of physicians, especially in primary care. But most are concentrated in the immediate Duluth area and around the Iron Range cities of Hibbing and Virginia. The Duluth area data in the table includes all of Carlton County and the southern half of St. Louis County. This area around Duluth has about 4 percent of the state's physicians and 3 percent of the state's population. The Range area (northern half of St. Louis County), as well as other parts of northeastern Minnesota, has a smaller share of physicians than population shares would suggest.

Mankato Area. A six-county area around Mankato accounts for a little more than 3 percent of the state's population, and just under 3 percent of the state's physicians. The area fares slightly better in primary care than non-primary care.

Willmar Area. Like the Mankato area, a six-county area around Willmar has nearly as many primary care physicians as its population would suggest. The Willmar area falls slightly short in its share of non-primary care physicians. Both Willmar and Mankato are close enough to the Twin Cities and Rochester to lose some specialty care patients to the larger markets.

The north central, northwestern, southwestern and west central regions of the state all have a smaller share of the state's physicians than of the state's population. All are closer to the norm for primary care, but they have small numbers of non-primary care specialists.

Southwestern Minnesota. This 14-county agricultural region accounts for almost 4 percent of the state's population, but less than 2 percent of the state's active physicians. The region falls particularly short in non-primary care. The region does have a few cities in the 10-15,000 population range, but no large urban centers. The far southwestern counties are also close to Sioux Falls, South Dakota, which is a major health care center for parts of three states.

West Central Minnesota. This 12-county region has 4.5 percent of the state's population, but only 2 percent of the state's active physicians. The area has small regional centers in Alexandria, Detroit Lakes and Fergus Falls as well as the city of Moorhead. The larger city of Fargo, across the Red River from Moorhead, serves some of the health care needs of this region. Similarly, the area around Breckenridge may also be partially served by physicians in Wahpeton, North Dakota.

Northwestern Minnesota. This seven-county region's share of the state's physician workforce also falls short of its population share. This mostly agricultural area includes small regional centers in Crookston and Thief River Falls, as well as the city of East Grand Forks, which is across the Red River from the larger city of Grand Forks, North Dakota.

North Central Minnesota. This large region of 13 counties from north of St. Cloud to the Canadian border has regional centers in Bemidji and Brainerd, but much of the region is lightly populated. It has about 7 percent of the state's population, but only 3 percent of the state's physicians. As a lake and recreation region, its population swells in the summer months.

PHYSICIAN-TO-POPULATION RATIOS

The data already presented translates into significant differences in the number of physicians per capita in different parts of the state. Overall, Minnesota has about 278 physicians for every 100,000 people. This total includes all specialties and physicians working for all public and private employers (including the federal government), but does not include physicians working as residents in graduate medical education programs. If Olmsted County is excluded, the total drops to 242 physicians per 100,000 population.

A little more than half of all practicing physicians work in primary care specialties. Overall, Minnesota has 142 primary care physicians per 100,000 population, and 137 non-primary care physicians per 100,000 population.

Olmsted County has an unusual concentration of non-primary care specialists. Excluding Olmsted County from the calculation reduces the number of specialists per 100,000 population to 109. If Olmsted County is excluded, primary care accounts for 55 percent of actively practicing physicians.

The following table and bar charts display physician per capita data for the geographic and urban breakdowns previously presented.

Generally, metropolitan and urban areas have more physicians per capita than more rural areas. The Duluth, Mankato, Rochester and Twin Cities areas have more physicians per capita than other

parts of the state. The agricultural and resource-based regions of western and northern Minnesota have fewer physicians per capita than the state as a whole.

Primary Care

Primary care physicians are more evenly distributed across the state than non-primary care physicians. The seven-county Twin Cities area has 154 primary care physicians per 100,000 population, compared to 127 for the 80 non-Twin Cities counties. The 21 metropolitan area counties have 148 per 100,000 population, compared to 122 in micropolitan areas and 128 in rural areas.

The Twin Cities area is worth a closer look. Hennepin (Minneapolis) and Ramsey (St. Paul) counties have 187 primary care physicians per 100,000 population, compared to only 107 in the five surrounding suburban counties. This data suggests that the location of physician practices has not shifted to suburban areas to the same extent that population has over the past half-century.

Non-primary Care

The tendency of non-primary care physicians to be concentrated in larger medical centers shows up dramatically in comparison of metropolitan, micropolitan and rural areas. Metropolitan area counties have more than three times as many non-primary care physicians as rural counties. Micropolitan counties fall in between, but closer to rural in specialist numbers.

The concentration of non-primary care physicians is greatest in Olmsted County, which has more than 1,150 per 100,000 population—far ahead of the Twin Cities area. This reflects that patients come from throughout the country and world for specialty care at the Mayo Clinic.

The gap between Hennepin and Ramsey counties, on the one hand, and the five suburban counties, is greater than for primary care. Hennepin and Ramsey counties have 227 non-primary care physicians per 100,000 population, compared to only 50 in the suburban counties. Large medical centers in Hennepin and Ramsey counties draw patients from the suburban counties and beyond.

Duluth, Mankato and St. Cloud also have more non-primary care specialists per capita than the state average, while the rural regions of western and northern Minnesota fall far short. This reflects the general tendency for specialists to practice in larger urban centers, but also the proximity of significant medical centers just across the border in the Dakotas.

Exhibit 5
Estimated Active Physicians per 100,000 Population, by Principal Work Site

	Counties	All Physicians	Primary Care	Non-Primary Care
MINNESOTA	87	278	142	137
(excluding Olmsted County)	86	242	133	109
Twin Cities and St. Cloud MSAs	13	289	148	141
Non-Twin Cities/St. Cloud	74	260	131	129
Twin Cities Met Council Area	7	309	154	155
Hennepin/Ramsey Co.	2	414	187	227
Suburban Counties	5	157	107	50
Greater Minnesota	80	243	127	116
MSA Counties	21	313	148	165
Micropolitan Counties	20	194	122	70
Rural Counties	46	178	128	50
Southeast Minnesota	10	550	190	359
Olmsted County	1	1,610	451	1,159
SE excluding Olmsted	9	129	87	42
Northeast Minnesota	5	240	147	94
Duluth Area*	*	334	186	148
Range Area**	**	126	96	30
St. Cloud Area	4	168	105	152
Mankato Area	5	251	140	111
Willmar Area	5	175	133	42
Southwestern Minnesota	14	109	89	19
West Central Minnesota	12	116	84	33
Northwestern Minnesota	7	120	100	20
North Central Minnesota	13	130	95	35

* Includes all of Carlton County and the south half of St. Louis County.

** Includes north half of St. Louis County, including cities of Chisholm, Ely, Eveleth, Hibbing and Virginia.

Exhibit 6

**Physicians per 100,000 Population, 2009
SEVEN-COUNTY TWIN CITIES AREA AND BALANCE OF STATE**

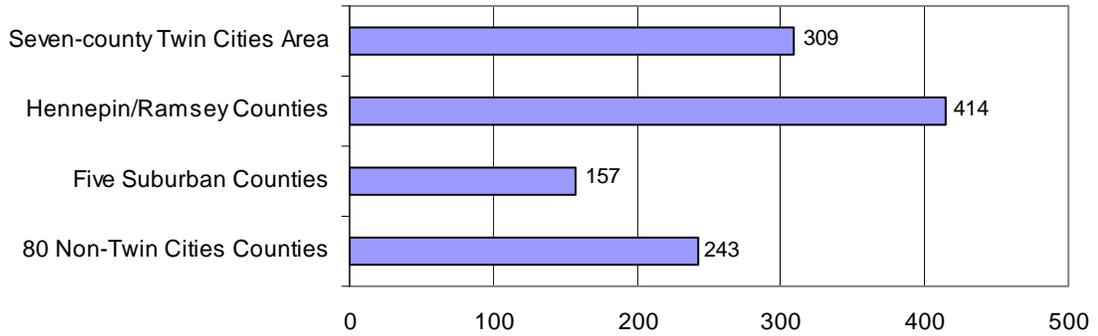


Exhibit 7

**Physicians per 100,000 Population, 2009
TWIN CITIES-ST. CLOUD REGION AND BALANCE OF STATE**



Exhibit 8

**Physicians per 100,000 Population, 2009
METROPOLITAN, MICROPOLITAN AND RURAL COUNTIES**

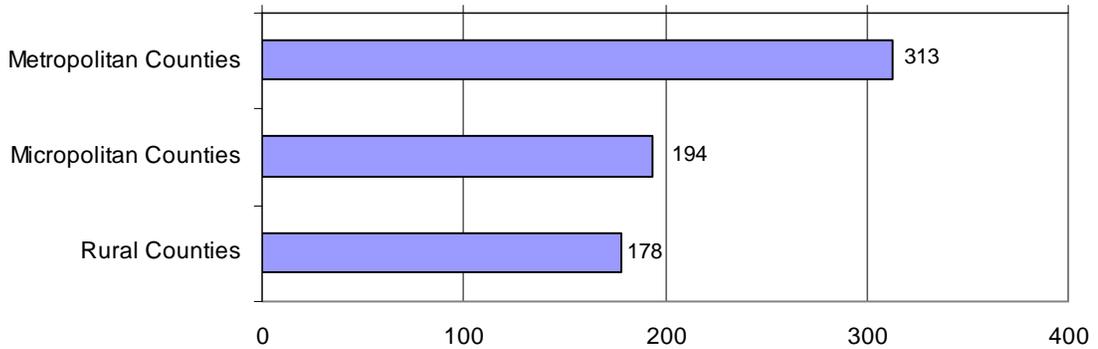


Exhibit 9

**Physicians per 100,000 Population, 2009
HEALTH SERVICE AREAS AND REGIONS**

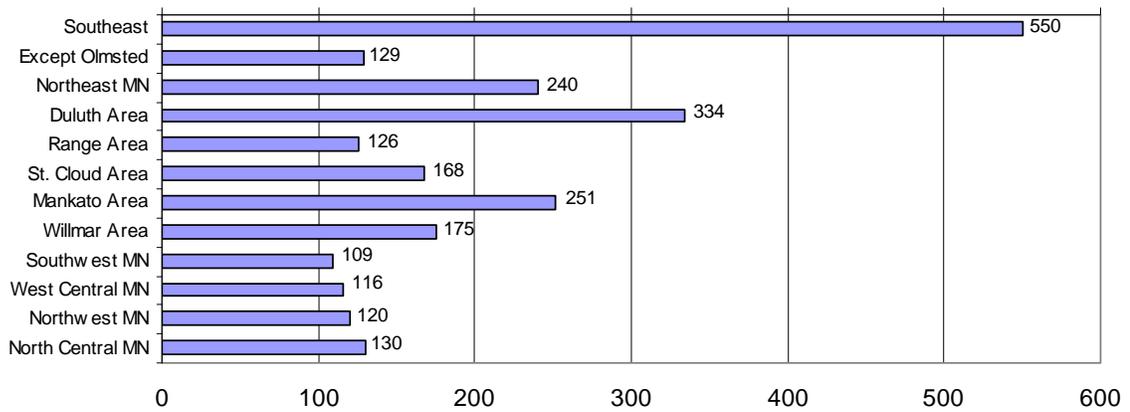


Exhibit 10

**Primary Care Physicians per 100,000 Population, 2009
METROPOLITAN COUNCIL AREA AND BALANCE OF STATE**

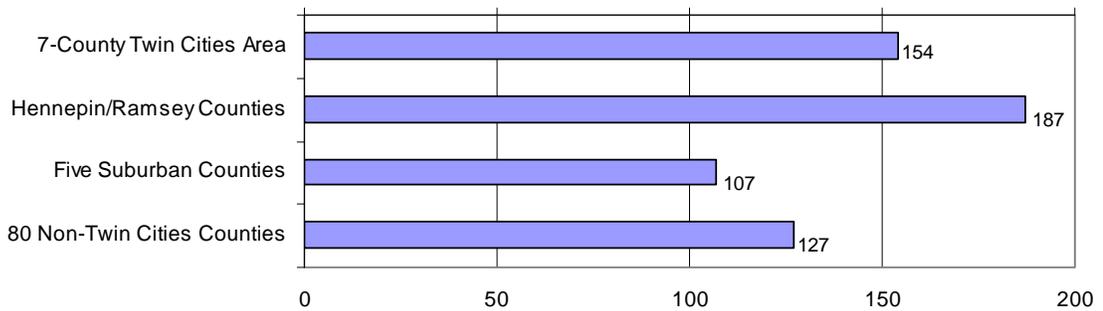


Exhibit 11

**Primary Care Physicians per 100,000 Population, 2009
TWIN CITIES-ST. CLOUD REGION AND BALANCE OF STATE**

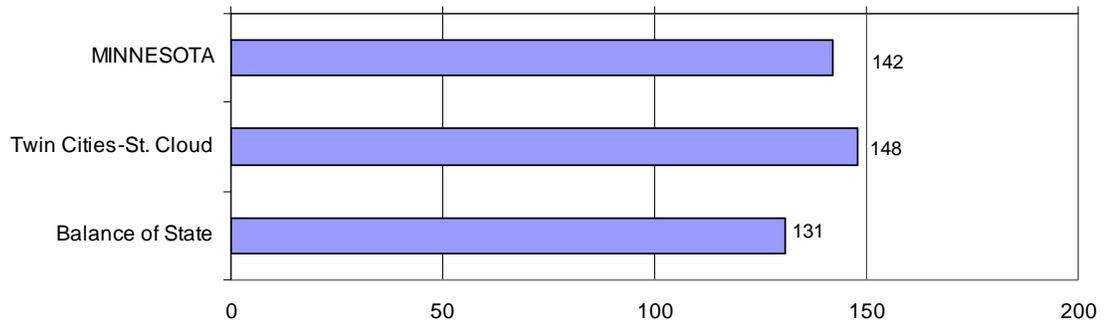


Exhibit 12

**Primary Care Physicians per 100,000 Population
METROPOLITAN, MICROPOLITAN AND RURAL COUNTIES**

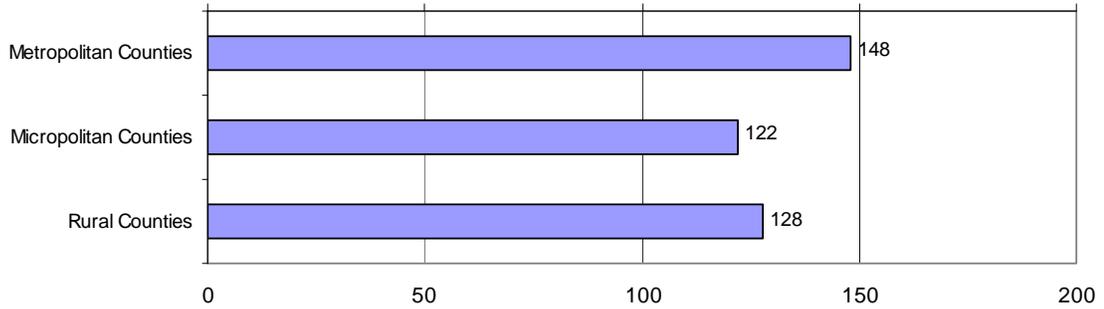


Exhibit 13

**Primary Care Physicians per 100,000 Population, 2009
HEALTH SERVICE AREAS AND REGIONS**

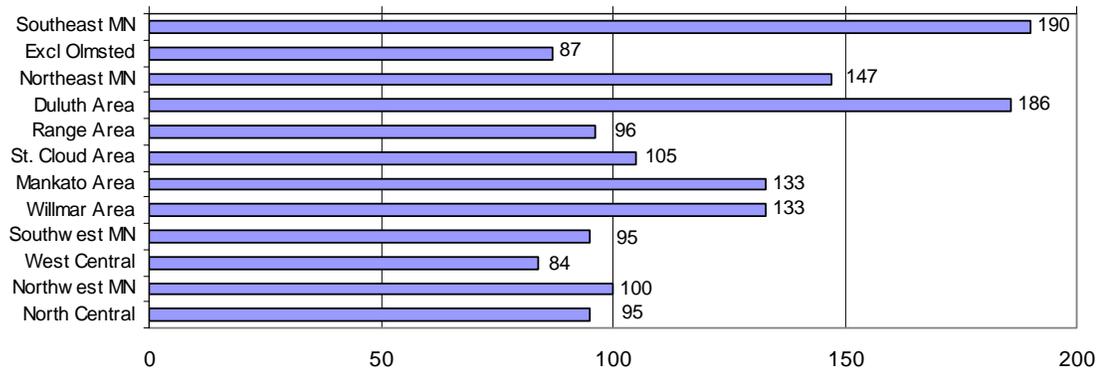


Exhibit 14

**Non-Primary Care Physicians per 100,000 Population, 2009
SEVEN-COUNTY TWIN CITIES AREA AND BALANCE OF STATE**

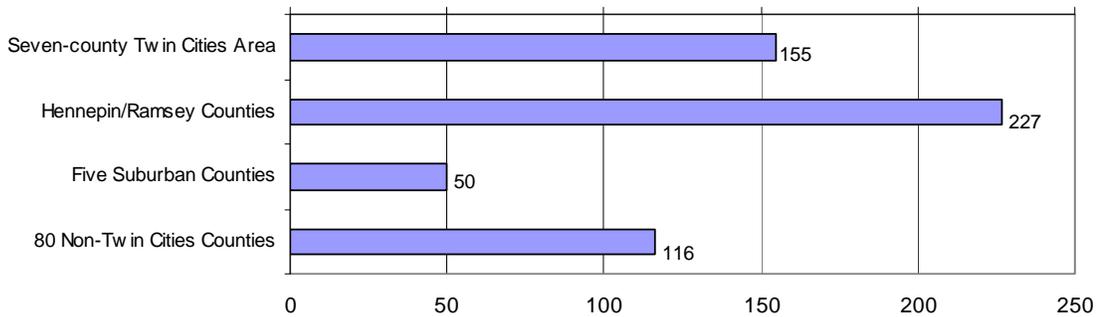


Exhibit 15

**Non-Primary Care Physicians per 100,000 Population, 2009
TWIN CITIES-ST. CLOUD AND BALANCE OF STATE**

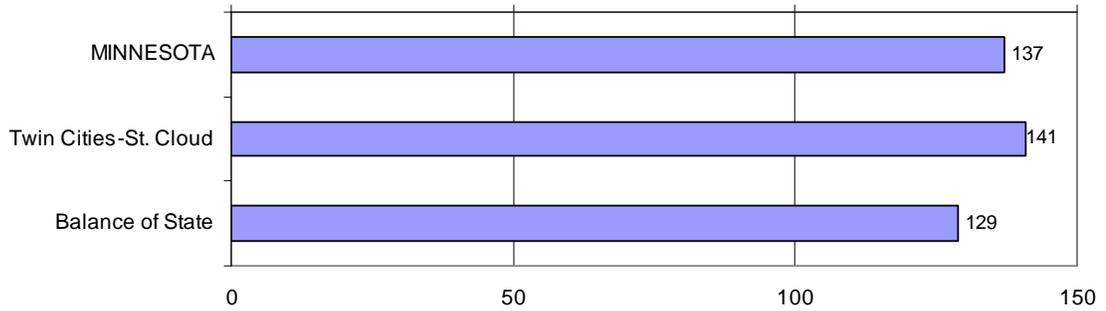


Exhibit 16

**Non-Primary Care Physicians per 100,000 Population
METROPOLITAN, MICROPOLITAN AND RURAL COUNTIES**

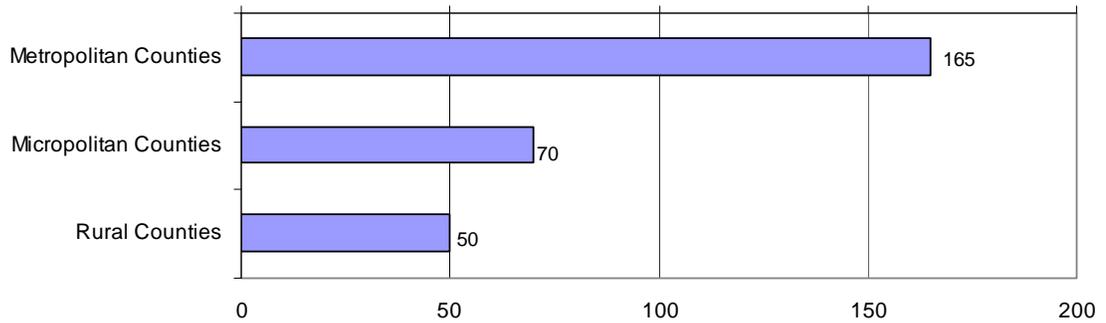


Exhibit 17
**Non-Primary Care Physicians per 100,000 Population, 2009
HEALTH SERVICE AREAS AND REGIONS**

