



# 2016 PHYSICIAN SUPPLY

Estimates for Washington State, Counties and  
Accountable Communities of Health

Office of Financial Management  
Health Care Research Center

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## 2016 Physician Supply: Estimates for Washington State, Counties and Accountable Communities of Health

### Executive Summary

In 2016, there were 18,730 physicians who provided patient care in Washington, or 261 physicians per 100,000 population. Washington's physician-to-population rate in 2016 was higher than the U.S. rate of 237 physicians per 100,000. Physicians in Washington had a median age of 50 and were older than the state's overall working-age population (ages 18-64 years) by eight years. Women made up 37 percent of the total physician workforce and their share has been increasing in recent years. However, there were fewer women in the physician workforce than in the state's working-age population (46 percent). Coincidentally, 37 percent was also the share of the state's physicians who practiced in primary care. Female physicians were more likely to be in primary care than male physicians, 46% and 31%, respectively.

The 39 counties varied considerably in their physician supplies and in characteristics of their physicians. For example, Garfield County had an aging physician supply with a median physician age of 63, about 16 years older than the youngest median age of 47 in Clark County. Overall, the five most populous counties (Clark, King, Pierce, Snohomish and Spokane) combined accounted for 65 percent of the state's population but 73 percent of the state's physician workforce. However, in certain specialties, some smaller counties were far ahead in their physician-to-population rates, such as Asotin County's rate of internal medicine physicians (63 per 100,000), Garfield County's rate of family medicine physicians (139 per 100,000) and Yakima County's rate of OB/GYNs (17 per 100,000).

There were also considerable disparities in physician supplies and variations in physician characteristics in the nine Accountable Communities of Health (ACH), although the differences were not as large as the differences observed between counties. For instance, at the county level, the proportion of female physicians ranged from 2 percent to 42 percent whereas at the ACH level, the range was 26 percent in Greater Columbia ACH to 42 percent in King County ACH. The King County ACH also led with the highest physician-to-population rate in seven of the ten specialties examined.

Detailed findings on physician supplies and characteristics are presented in Section 1 (state), Section 2 (counties) and Section 3 (ACHs). The Appendix includes a narrative of the data sources and method and three tables of data used for this report.

This report marks the first time the Network Access Reports (NAR) have been used for estimates of physician supply in Washington. Health insurance companies conducting business in Washington are required to file the monthly NARs with the state's Office of the Insurance Commissioner (OIC). The purpose of the NARs is to demonstrate adequate provider networks for services provided by the insurance companies. Contents of the NARs include key data elements usually used in provider supply analyses such as provider type, taxonomy and practice location. The NARs are publicly available on the OIC's website. The availability of the NARs on the monthly basis makes it a valuable source for developing timely estimates of provider supplies.

## Section 1. State Physician Supply

### Key Findings

- *Overall physician supply.* In 2016, there were 18,730 physicians practicing in Washington, equivalent to 261 physicians per 100,000 population.
- *Median age of physicians.* Washington's physicians, with a median age of 50, were eight years older than the state's total working-age (ages 18-64 years) population.
- *Share of female physicians.* Women constituted 37 percent of the total physicians and this share was smaller than the proportion of women in the state's total workforce (46 percent).
- *Age difference between female and male physicians.* Female physicians in Washington had a median age of 45 and were about eight years younger than male physicians.
- *Recent growth of female and male physician supplies.* The annual growth in the female physician supply in recent years approached the growth of the male physician supply. In 2014, there were about 450 new physicians added in each group.
- *Physician Supply by specialty.* The two largest physician specialty groups are family medicine and internal medicine, with 2,929 and 2,712 physicians, respectively.
- *Supplies of primary care physicians and specialist physicians.* Primary care physicians accounted for 37 percent of physicians with the balance being specialist physicians. There were 96 primary care physicians and 165 specialist physicians per 100,000 population.
- *County physician supplies.* The five most populous counties (King, Pierce, Spokane, Snohomish and Clark) had 73 percent of the physicians while accounting for 65 percent of state's population.
- *Distribution of physicians by Accountable Communities of Health.* The King County ACH had the largest share of the state's physicians, 41.7 percent. The other eight ACHs each had 3.1 percent to 11.9 percent.
- *Distribution of physicians in urban and rural areas.* Urban areas had a rate of 292 physicians per 100,000 population, three times as large as the rural area rate of 97 physicians per 100,000 population.

## Total Physician Supply

In December 2016, there were 18,730 physicians providing patient care in Washington (Chart 1). This number represents 63 percent of all physicians with active physician licenses issued by the Department of Health.<sup>1</sup> Overall, the state had 261 practicing physicians per 100,000 population. This rate is higher than the U.S. rate of 237 physicians per 100,000 population in 2016 (Chart 2).<sup>2</sup>

Chart 1. Physician Licenses and Practicing Physicians, Washington, 2016

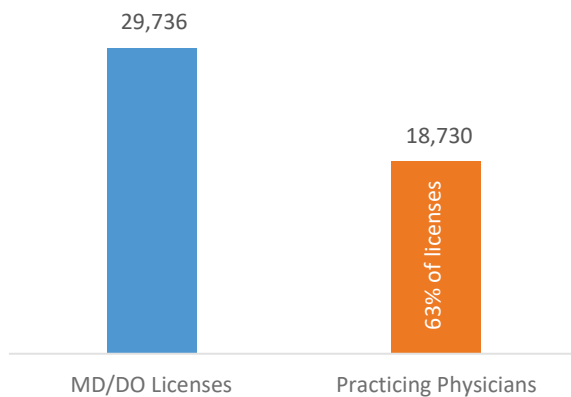
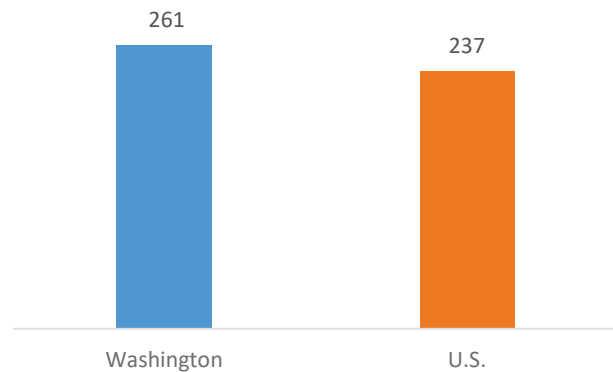


Chart 2. Total Practicing Physicians per 100,000 Population, Washington and U.S., 2016



## Age and Sex of Physicians

Washington's practicing physicians had a median age of 50 in 2016. The state's physicians were eight years older on average than the state's general working-age population who had a median age of 42 in 2016 (Chart 3).<sup>3</sup> Overall, 63 percent of the practicing physicians were male and 37 percent female. The share of female physicians is smaller than the 46 percent of female workers in the state general population (Chart 4).<sup>4</sup>

Chart 3. Median Age of Physicians and All Workers, Washington, 2016

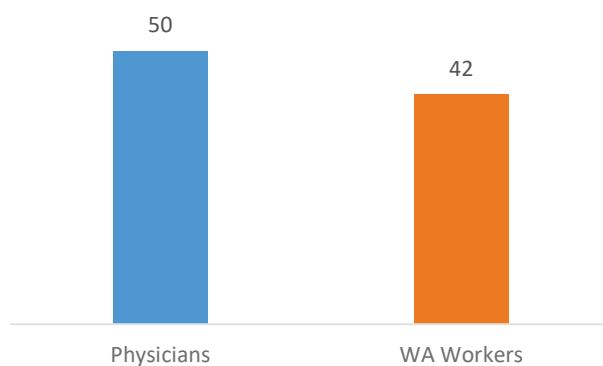
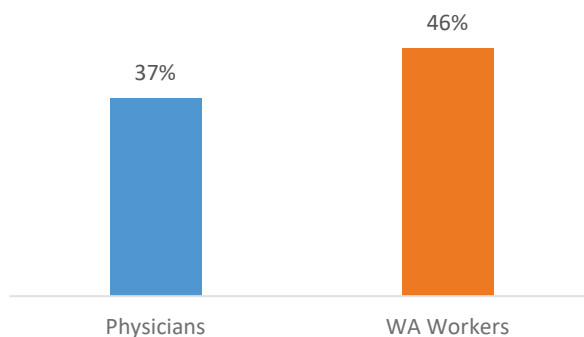


Chart 4. Percent Female of Physicians and All Workers, Washington, 2016



<sup>1</sup> The DOH physician licenses include those issued for MDs and DOs.

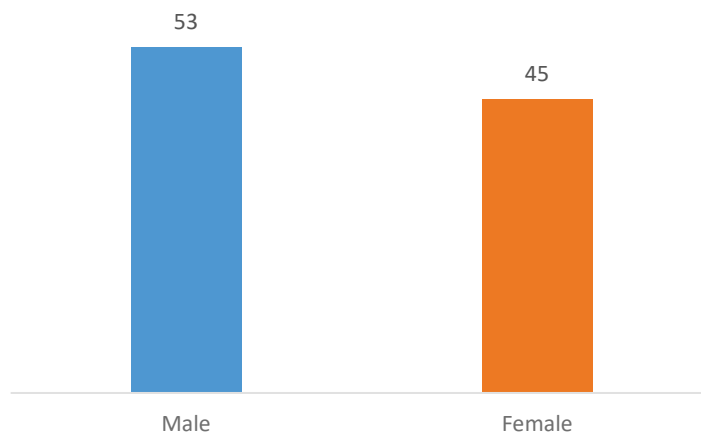
<sup>2</sup> Association of American Medical Colleges. *2017 State Physician Workforce Data Report*. November 2017.

<sup>3</sup> Median age of the general working-age (ages 18-64 years) population was calculated by staff using the 2016 American Community Survey 1-year PUMS file.

<sup>4</sup> Share of female workers in the state general population was calculated by staff using the 2016 American Community survey 1-year PUMS file.

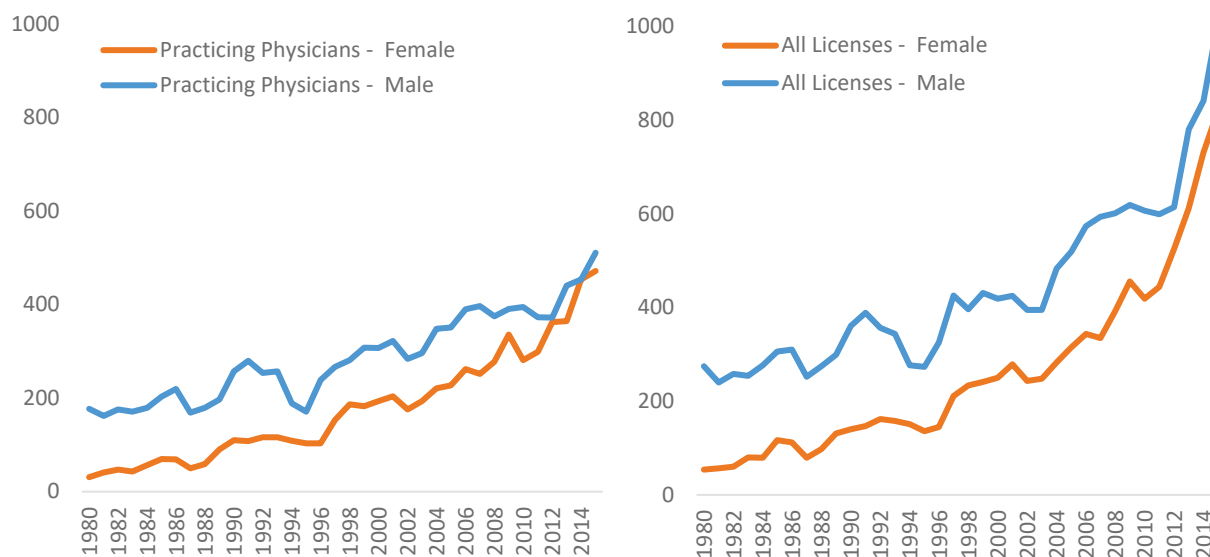
Female physicians were on average younger than male physicians by approximately eight years. The median age of female physicians was 45, and the median age of male physicians was 53 (Chart 5).

Chart 5. Median Age, Male and Female Physicians, Washington, 2016



Female physicians had a younger median age, in part, because more female physicians joined the state's health care delivery system in recent years. Data on length of time since a physician was first licensed in Washington revealed the growth of female physician supply was faster than the growth of male physician supply in recent years, regardless of whether the licensed physicians currently practiced in Washington or not. Among physicians currently practicing in Washington, the number of female physicians with licenses issued in the last few years approached the number of male physicians, closing the persistent gap established in previous decades. Total licenses issued to physicians (which included those who were not currently practicing in Washington) showed the same growth patterns for male and female physician supplies (Chart 6).

Chart 6. First Year of Physician License Issuance: Male Physicians and Female Physicians, Washington

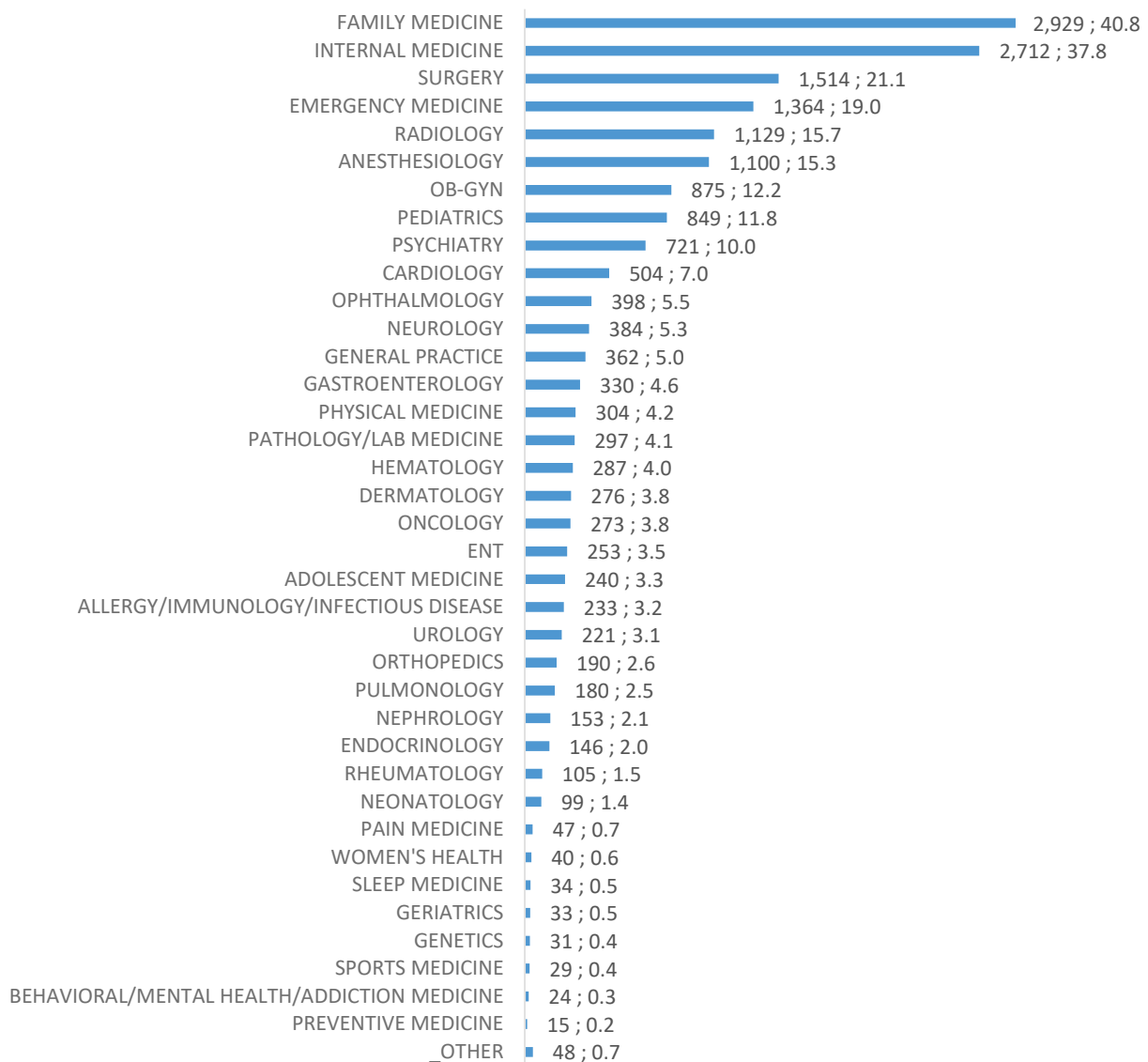




### Physician Supply by Specialty

Washington's physicians practiced in a variety of specialties. The specialties of family medicine and internal medicine were the two largest groups of physicians.<sup>5</sup> With 2,929 family medicine physicians and 2,712 internal medicine physicians, these specialties provided 41 and 38 physicians per 100,000 population, respectively. Four other specialties were composed of 1,000-1,500 physicians each, with rates ranging from 15 to 21 physicians per 100,000 population: surgery, emergency medicine, radiology and anesthesiology. The specialties of OB-GYN, pediatrics, psychiatry and cardiology each had 500-1,000 physicians with a rate of 7-12 physicians per 100,000 population. The remaining specialties each had fewer than 400 physicians with a rate of five or fewer physicians per 100,000 population (Chart 7).

Chart 7. Number and Rate (per 100,000) of Physicians by Primary Specialties, Washington, 2016

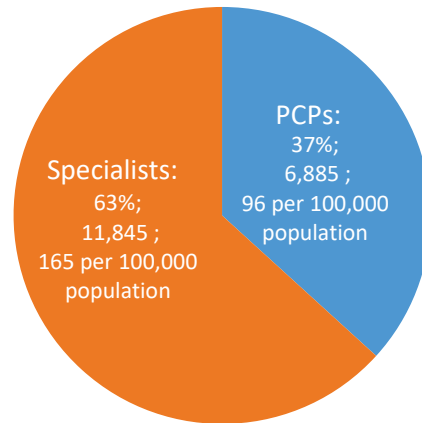


<sup>5</sup> Specialty in this study refers to only the primary specialty of a physician.

## Supplies of Primary Care Physicians and Specialist Physicians

For this report, primary care physicians (PCP) refer to those practicing in the following specialties: family medicine, general practice, geriatrics, internal medicine and pediatrics. Together these specialties accounted for 6,885 physicians or 37 percent of all physicians practicing in Washington in 2016. The remaining 11,845 were specialist physicians. This means there were 96 PCPs, compared with 165 specialist physicians, per 100,000 population (Chart 8).

Chart 8. Number, Percentage and Rate of PCPs and Specialist Physicians, Washington, 2016



PCPs were slightly younger than specialist physicians. PCPs had a median age of 48 years while specialist physicians had a median age of 50 (Chart 9). Female physicians made up a larger share of PCPs than they did of specialist physicians. While 46 percent of PCPs were female, only 31 percent of specialists were female (Chart 10). The age difference between male and female physicians seen across all physicians extended to PCPs and specialist physicians. Among the PCPs, female physicians were seven years younger than male physicians, with a median age of 45 years. Among the specialist physicians, they were also about seven years younger than male physicians, with a median age of 46 years (Chart 11).

Chart 9. Median Age of Overall Physicians, PCPs and Specialists, Washington, 2016

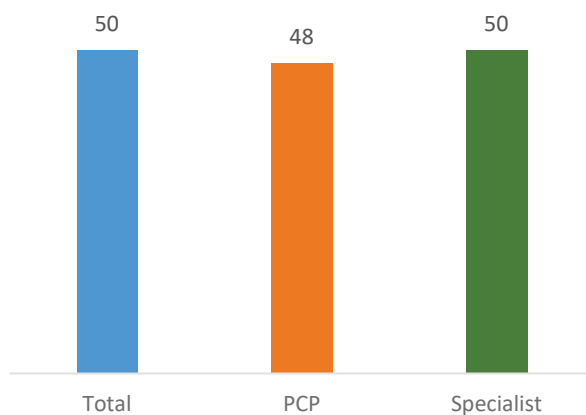


Chart 10. Female Physicians (%): Total, PCPs and Specialists, Washington, 2016

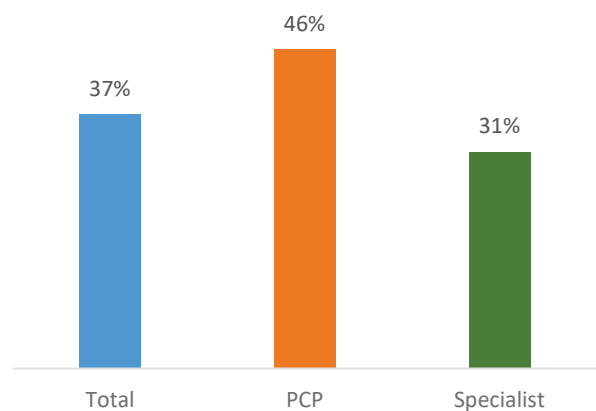
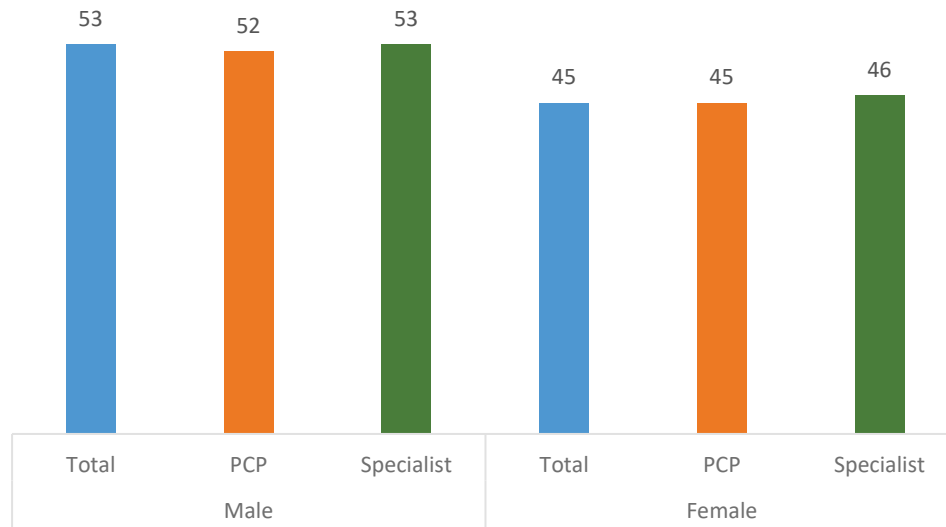


Chart 11. Median Age of Total Physicians, PCPs and Specialists by Gender, Washington, 2016

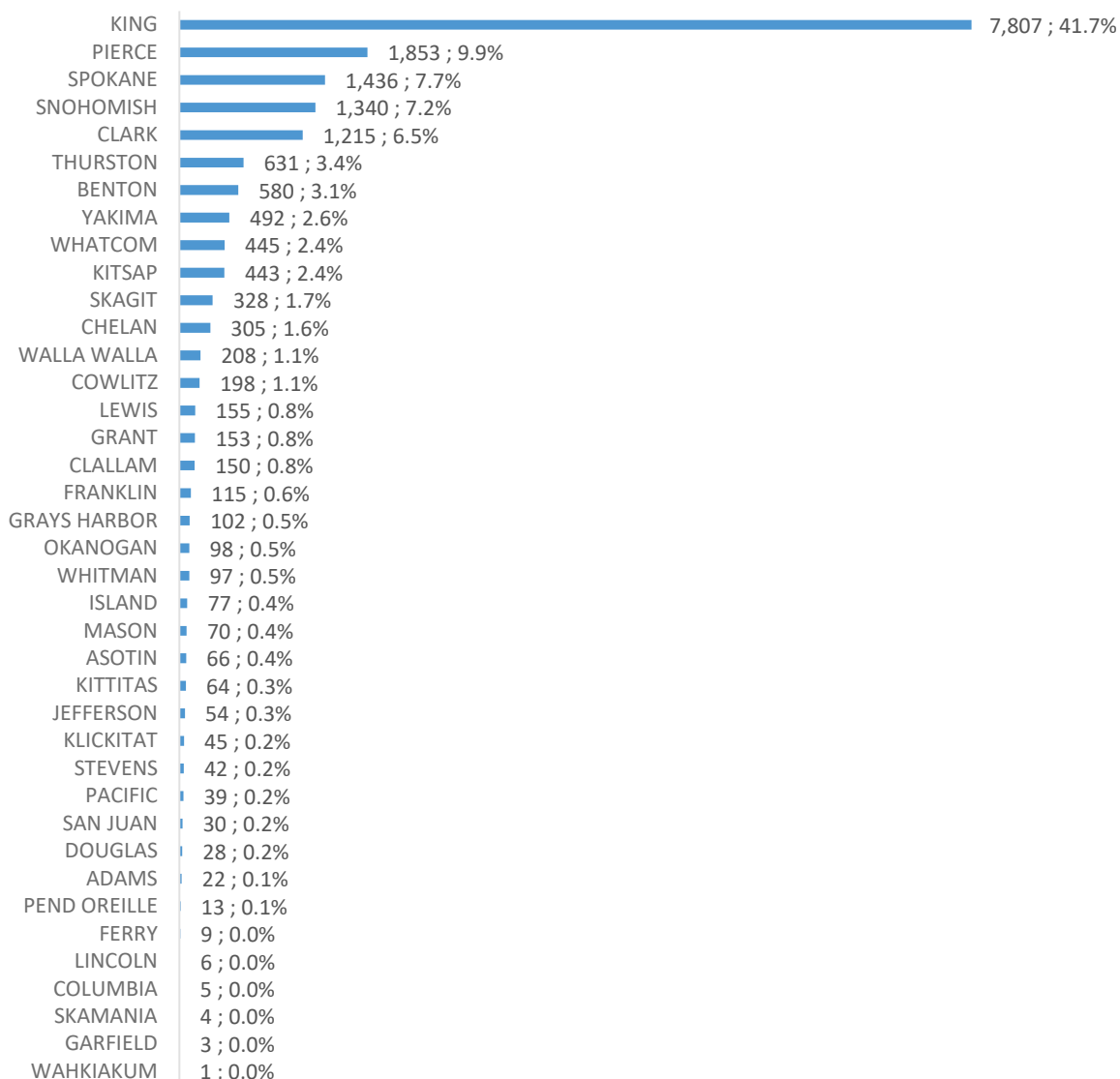


## County Physician Supplies

Washington's practicing physicians are overwhelmingly distributed in the most populous counties. The largest county, King, had 41.7 percent, or 4,807, of the state's total physicians. Pierce County came in second with 9.9 percent, or 1,853 physicians, followed by Spokane (7.7 percent; 1,436 physicians), Snohomish (7.2 percent; 1,340 physicians) and Clark (6.5 percent; 1,215 physicians). Together, these five most populous counties had 73 percent of the state's total physicians while accounting for 65 percent of the state's population. The remaining 34 counties each had less than 4 percent of the physicians and the majority of these counties (25) had less than 1 percent of the total physicians (Chart 12).<sup>6</sup>

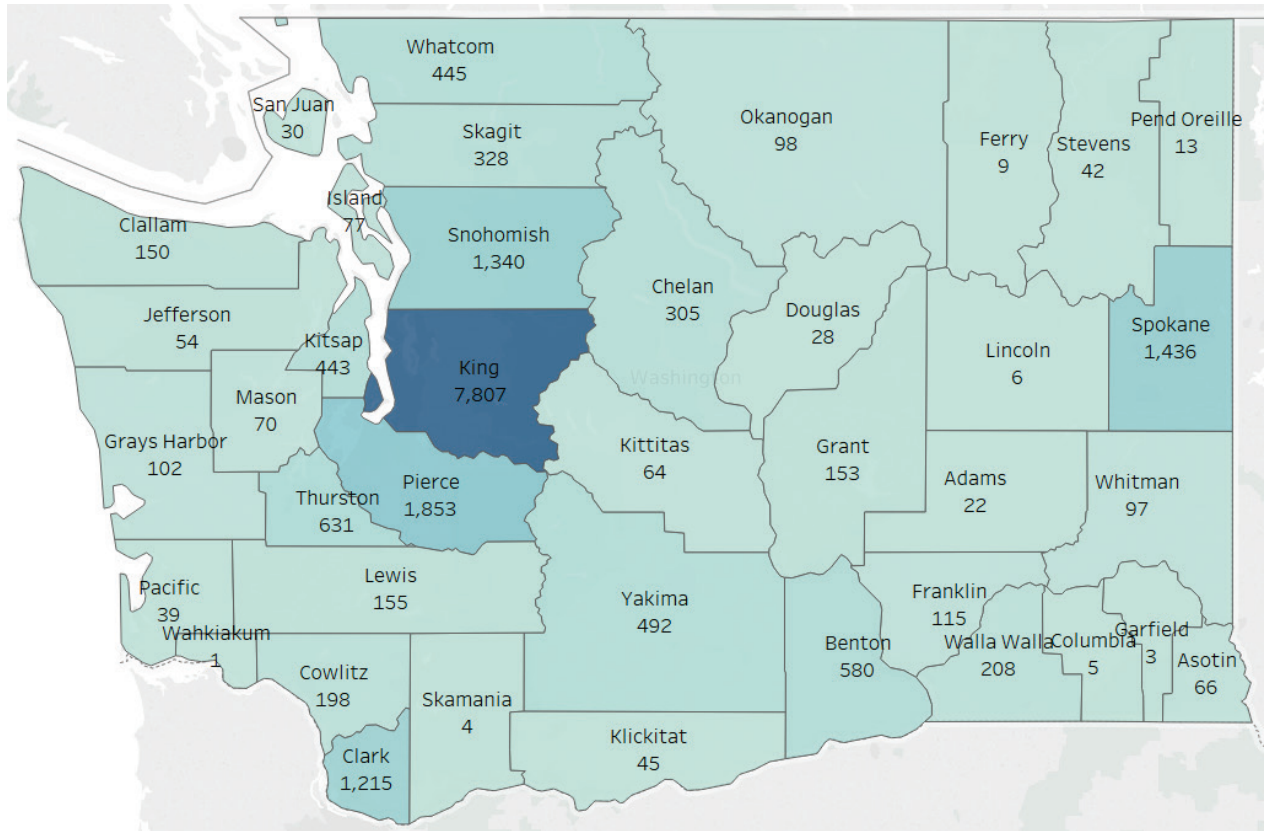
More data on county physician supplies are presented in Section 2.

Chart 12. Distribution of Total Physicians by County: Number and Percent, 2016



<sup>6</sup> See the Data Source and Notes section in the Appendix about the method used in this study to distribute physicians to counties if they had practice locations in multiple counties.

Map 1. Distribution of Total Physicians by County, 2016



### Physician Supplies in Accountable Communities of Health

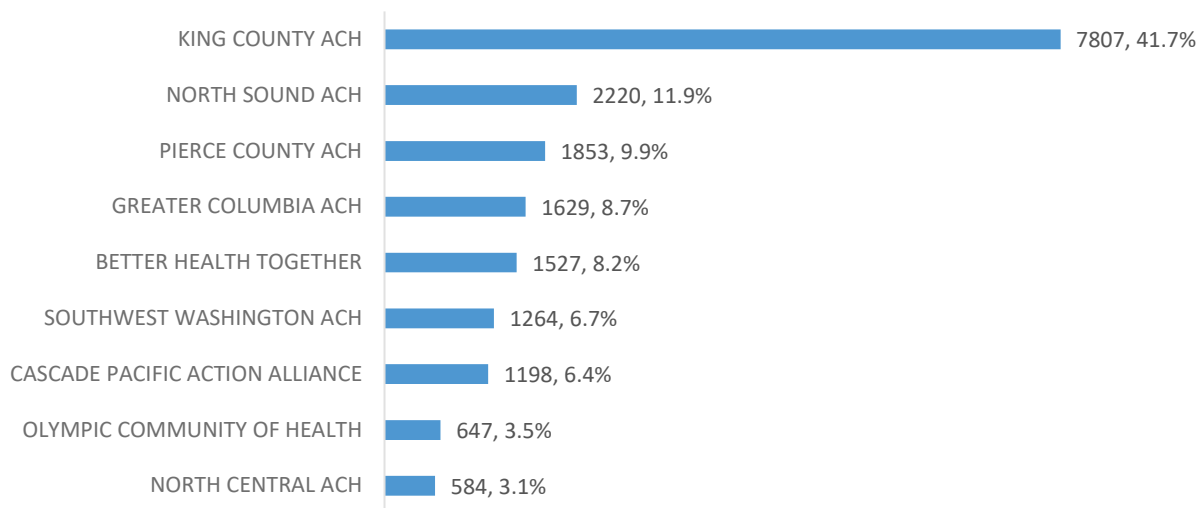
Washington state has recently implemented several health system transformation initiatives. One such initiative is the establishment of Accountable Communities of Health (ACH). An ACH is a regional coalition consisting of representatives from a variety of sectors, working together to improve population health. Each ACH represents a county or a group of adjacent counties. There are nine ACHs in the state:<sup>7</sup>

1. Better Health Together (Adams, Ferry, Lincoln, Pend Oreille, Spokane and Stevens)
2. Cascade Pacific Action Alliance (Cowlitz, Grays Harbor, Lewis, Mason, Pacific, Thurston and Wahkiakum)
3. Greater Columbia ACH (Asotin, Benton, Columbia, Garfield, Franklin, Kittitas, Walla Walla, Whitman and Yakima)
4. King County ACH
5. North Central ACH (Chelan, Douglas, Grant and Okanogan)
6. North Sound ACH (Island, San Juan, Skagit, Snohomish and Whatcom)
7. Olympic ACH (counties: Clallam, Jefferson and Kitsap)
8. Pierce County ACH
9. Southwest Washington ACH (Clark, Klickitat and Skamania)

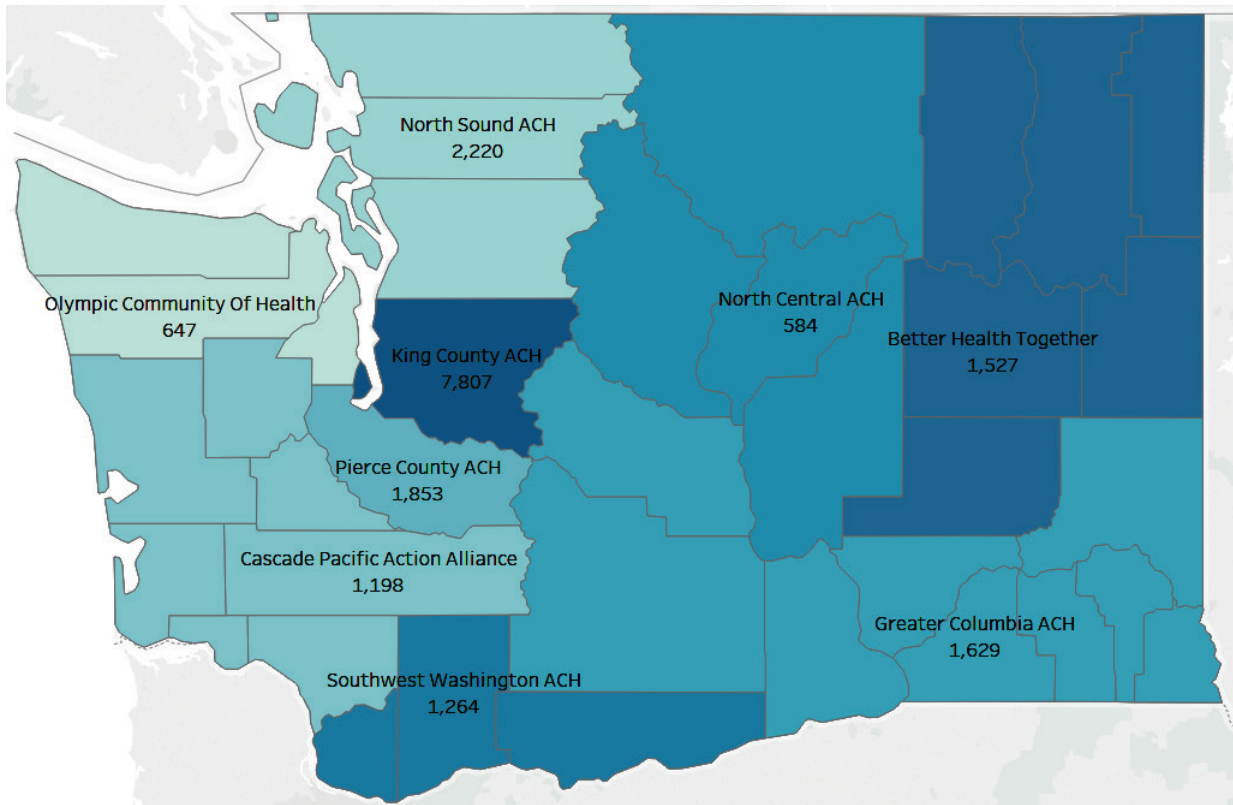
The King County ACH had the largest share of the total physicians, at 41.7 percent or 7,807 physicians. The distant second ACH was North Sound ACH, which includes Snohomish County and counties to its north. North Sound ACH had 11.9% or 2,220 physicians. The remaining ACHs each had less than 10 percent of the total physicians (Chart 13).

More data on ACH physician supplies are presented in Section 3.

*Chart 13. Distribution of Total Physicians by ACH: Number and Percent, 2016*



<sup>7</sup> See <https://www.hca.wa.gov/assets/program/achfactsheet.pdf>.

*Map 2. Distribution of Physicians by ACH Region, 2016*

### Physician Supplies in Urban and Rural Areas

The overwhelming majority of Washington’s physicians practiced in urban areas.<sup>8</sup> Only six percent of all physicians practiced in rural areas (Chart 14), whereas those areas account for 16 percent of the state’s population. A slightly larger percentage of PCPs practiced in rural areas than the percentage of specialist physicians (7 percent vs. 5 percent). Female and male physicians did not differ greatly in whether they practiced in urban or rural areas, regardless of their PCP/specialist status. Overall, a slightly smaller percentage of female physicians practiced in rural areas when compared with male physicians (5 percent vs. 6 percent). The physician-to-population rate for urban areas, 292 physicians per 100,000 population, was three times larger than the rate for rural areas, 97 physicians per 100,000 population (Chart 15).

Chart 14. Percentages of Physicians Practicing in Urban and Rural Areas by Gender, 2016: Total Physicians, PCPs and Specialists

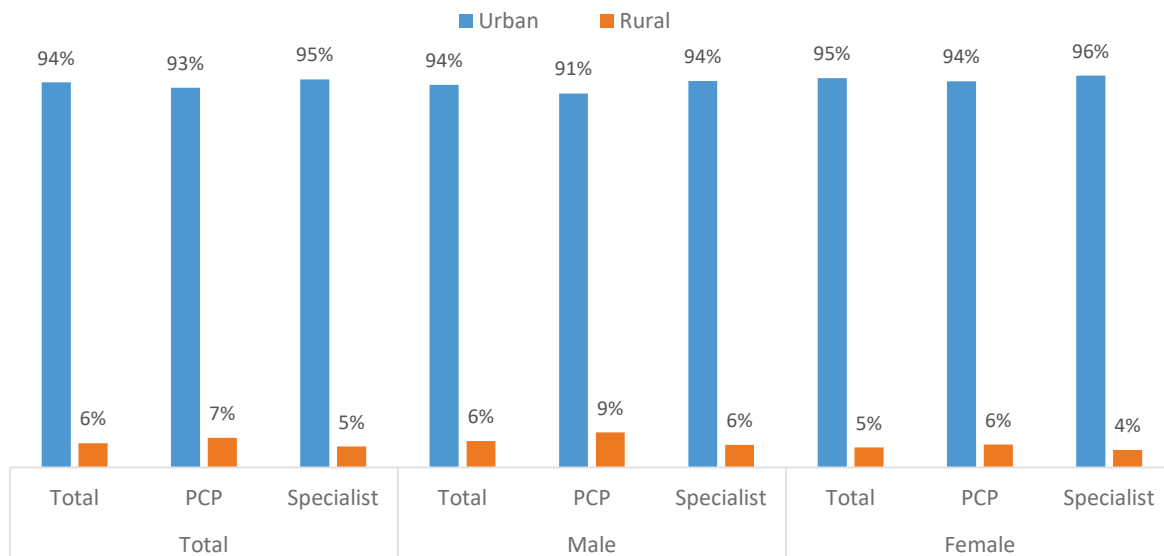
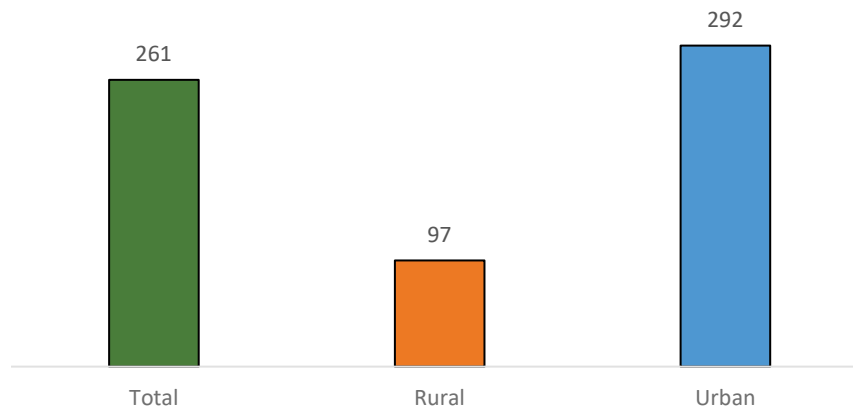


Chart 15. Physicians per 100,000 Population in Urban and Rural Areas, 2016



<sup>8</sup> The designation of urban and rural areas is based on the Missouri Census Data Center’s crosswalk file for ZIP Code to Urban/Rural. According to this approach, a ZIP Code can be partially urban and partially rural. For more detailed explanation, see “Urban-Rural Portion” at <http://mcdc.missouri.edu/websas/maggot14.shtml#urbrur>. Also see the section for “Urban/Rural areas” in Data Sources and Method in the appendix.



## Section 2. County Physician Supply

### Key Findings

- *Overall physician supply.* Overall physician supply rates ranged considerably among the counties. Chelan County led all other counties with a rate of 402 physicians per 100,000 population. This rate is about 21 times as large as the lowest county rate of 19 physicians per 100,000 population in Wahkiakum.<sup>9</sup> Three in four counties had a rate below the state rate of 261 physicians per 100,000 population.
- *Median age.* The median age of physicians ranged from 47 in Clark County to 63 in Garfield County. In most counties (29), the median age was above the statewide median age of 50.
- *Percent of female physicians.* While 37 percent of the physicians statewide were female, in most counties the share of female physicians was far smaller. With a range of 2 percent to 42 percent among all counties, only six counties had a share of female physicians greater than 37 percent.
- *Percent of physicians licensed since 2000.* The high percentages (above 65 percent) of physicians licensed since 2000 in Lincoln, Clark, Benton, Lewis, Grant and Franklin counties suggest that those counties experienced recent increases in total physicians. However, 24 counties had rates below the statewide average of 60 percent. Garfield had the smallest share, 5 percent.
- *Supply of PCPs.* The supply of PCPs varied widely at the county level with a range of 15 to 145 PCPs per 100,000 population. The statewide rate of 96 PCPs per 100,000 population was only 66 percent as large as the highest rate in Walla Walla County, but it was more than six times as large as the lowest rate in Wahkiakum.
- *Supply of specialist physicians.* County supply of specialist physicians was associated with the largest disparity. Chelan County's rate of 275 specialist physicians was nearly 70 times as large as the lowest rate of 4 specialist physicians per 100,000 population in Wahkiakum County.
- *Physician supply by specialty.* All ten of the specific specialties examined show large disparities of physician supply at county level. Some counties had no physicians in some of the specialties. No single county led in physician supply in all specialties. The counties with the highest rates were not necessarily those with the largest number of physicians or largest overall physician-to-population rate. The counties that led in physician-to-population rates in the 10 specialties examined (number in parentheses refers to physicians per 100,000 population) are:

Anesthesiology – Benton (33)	OB/GYN – Yakima (17)
Emergency Medicine – San Juan (46)	Pediatrics – King (17)
Internal Medicine – Asotin (63)	Psychiatry – King (20)
Cardiology – San Juan (22)	Radiology – Okanogan (62)
Family Medicine – Garfield (139)	Surgery – Chelan (42)

Table 1 below provides a quick look at how each county compares to the state in its physician characteristics and supply. It is followed by detailed county physician data.

<sup>9</sup> See the Data Source and Notes section in the Appendix about the method used in this study to distribute physicians to counties if they had practice locations in multiple counties.

Table 1. At-A-Glance: County Physician Characteristics and Supplies in Comparison to Statewide Average, 2016

	County	State Average	ADAMS	ASOTIN	BENTON	CHELAN	CLALLAM	CLARK	COLUMBIA	COWLITZ	DOUGLAS	FERRY	FRANKLIN	GARFIELD	GRANT	GRAYS HARBOR	ISLAND	JEFFERSON	KING	KITSAP	KITTITAS	KLICKITAT
Physician Characteristics	Median Age	50	+	+	+		+	-	+		+	+	+	+		+	+	+	-	+	+	+
	% Female	37	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-
	% Licensed Since 2000	60	-	-	+	+	-	+	-	+	-	-	+	-	+	-	-	-	-	-	-	+
Physicians per 100,000 population	Overall	261	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	PCP	96	-	+	-	+	+	+	-	-	-	-	-	+	-	-	-	-	+	-	-	-
	Specialist	165	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Anesthesiology	15	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Cardiology	7	+	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-
	Emergency Medicine	19	+	+	+	+	-	-	+	-	-	+	-	-	-	+	-	+	+	-	+	-
	Family Medicine	41	+	+	-	+	+	-	+	-	-	+	-	+	-	-	-	-	+	-	-	+
	Internal Medicine	38	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	OB/GYN	12	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Pediatrics	12	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Psychiatry	10	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
	Radiology	16	-	+	+	+	-	-	-	-	+	-	+	-	+	+	-	-	+	-	-	+
	Surgery	21	-	+	+	+	-	+	-	+	-	-	-	-	-	-	-	-	+	+	-	+
	Other Specialties	70	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-

## Symbols:

- +
  - 
  - ||
- Above state average  
Below state average  
Same as state average

Table 1. At-A-Glance: County Physician Characteristics and Supplies in Comparison to Statewide Average, 2016 (continued)

Physician Characteristic	County	State Average	LEWIS	LINCOLN	MASON	OKANOGAN	PACIFIC	PEND OREILLE	PIERCE	SAN JUAN	SKAGIT	SKAMANIA	SNOHOMISH	SPOKANE	STEVENS	THURSTON	WAHIAKUM	WALLA WALLA	WHATCOM	WHITMAN	YAKIMA
	Median Age	50	+			+	+	-	-	+	+	+	-	+	+	+	+	+	+	+	+
% Female	37	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-
% Licensed Since 2000	60	+	+	+	+	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	+
Physicians per 100,000 population	Overall	261	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	+	-	-	-
	PCP	96	+	-	-	-	-	-	-	-	+	-	-	+	-	+	-	+	-	-	-
	Specialist	165	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	+	-	-	-
	Anesthesiology	15	-	-	-	-	-	-	+	-	-	-	-	+	-	+	-	+	+	-	-
	Cardiology	7	-	-	-	+	-	-	-	+	+	-	-	+	-	-	-	+	-	-	+
	Emergency Medicine	19	+	-	+	+	+	-	+	+	-	-	-	+	-	-	-	+	-	-	-
	Family Medicine	41	-	-	-	+	-	-	-	+	+	-	-	+	+	+	-	-	+	+	-
	Internal Medicine	38	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	+	-	-	-
	OB/GYN	12	-	-	-	-	-	-	-	+	-	+	-	-	+	-	+	-	-	-	+
	Pediatrics	12	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Psychiatry	10	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	+	-
	Radiology	16	+	-	-	+	+	-	-	-	-	-	-	-	+	-	-	-	+	-	+
	Surgery	21	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	+	-	-
	Other Specialties	70	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	+	-	-

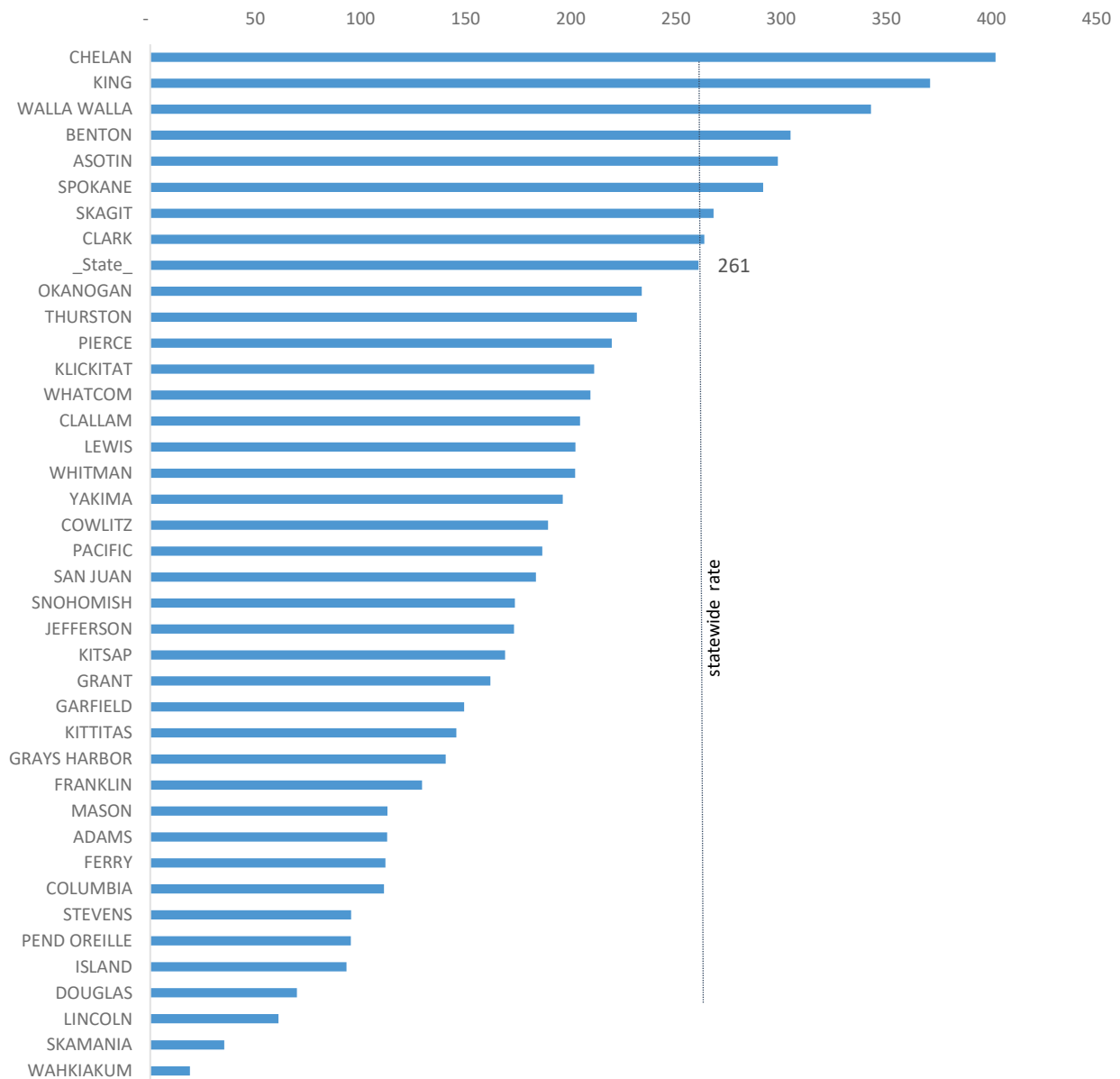
## Symbols:

- +
  - 
  - ||
- Above state average  
Below state average  
Same as state average

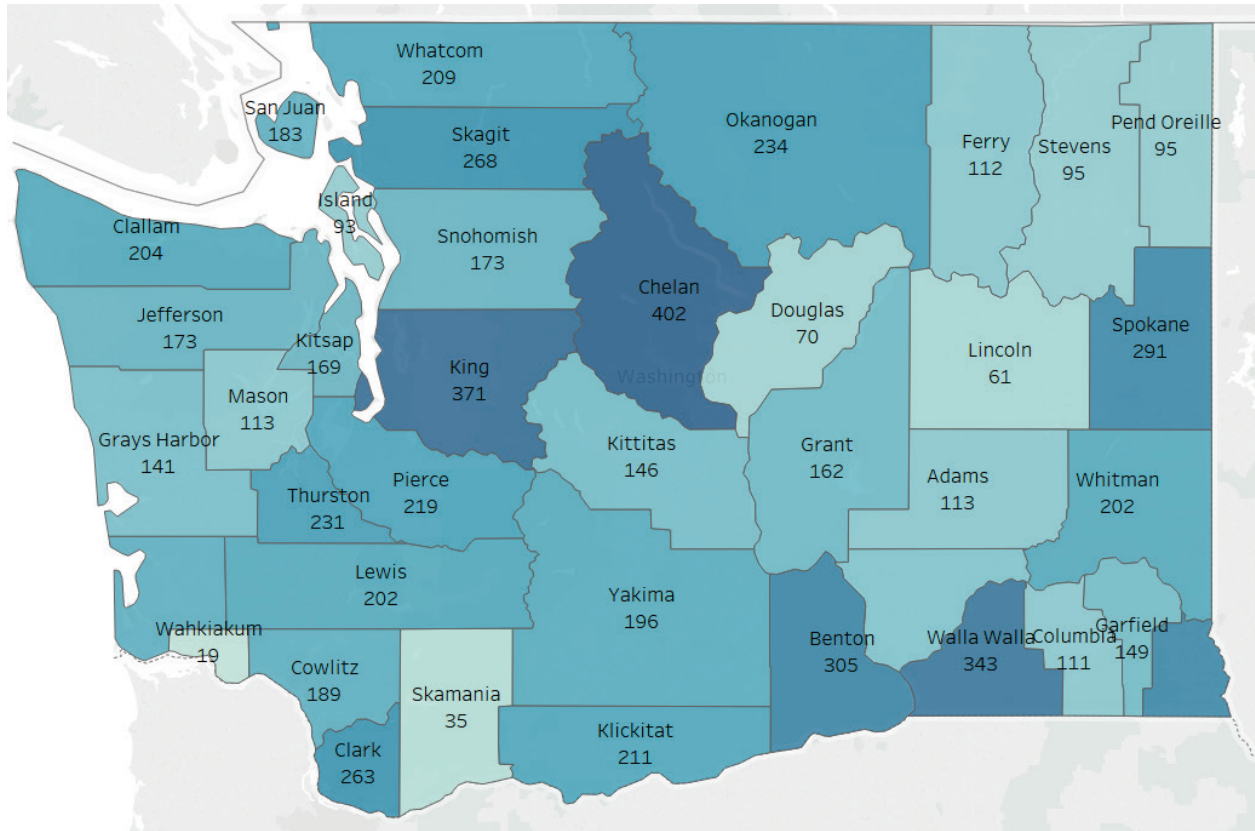
### County – Overall Supply of Physicians

Washington’s counties had a large disparity in overall physician supplies when measured with physician-to-population rates. While the statewide rate was 261 per 100,000 population, county rates ranged from the high of 402 (Chelan) to the low of 19 (Wahkiakum). This means the county with the highest rate had a physician supply that was about 20 times larger than the county with the lowest rate. Only eight counties had rates greater than the state rate. A county population size does not seem to be the decisive factor in its physician supply. The eight counties with rates above the state rate include three large counties (Clark, King and Spokane) and five relatively small counties (Asotin, Benton, Chelan, Skagit and Walla Walla).

Chart 16. Ranking of Overall Physician Rates (per 100,000) by County, 2016



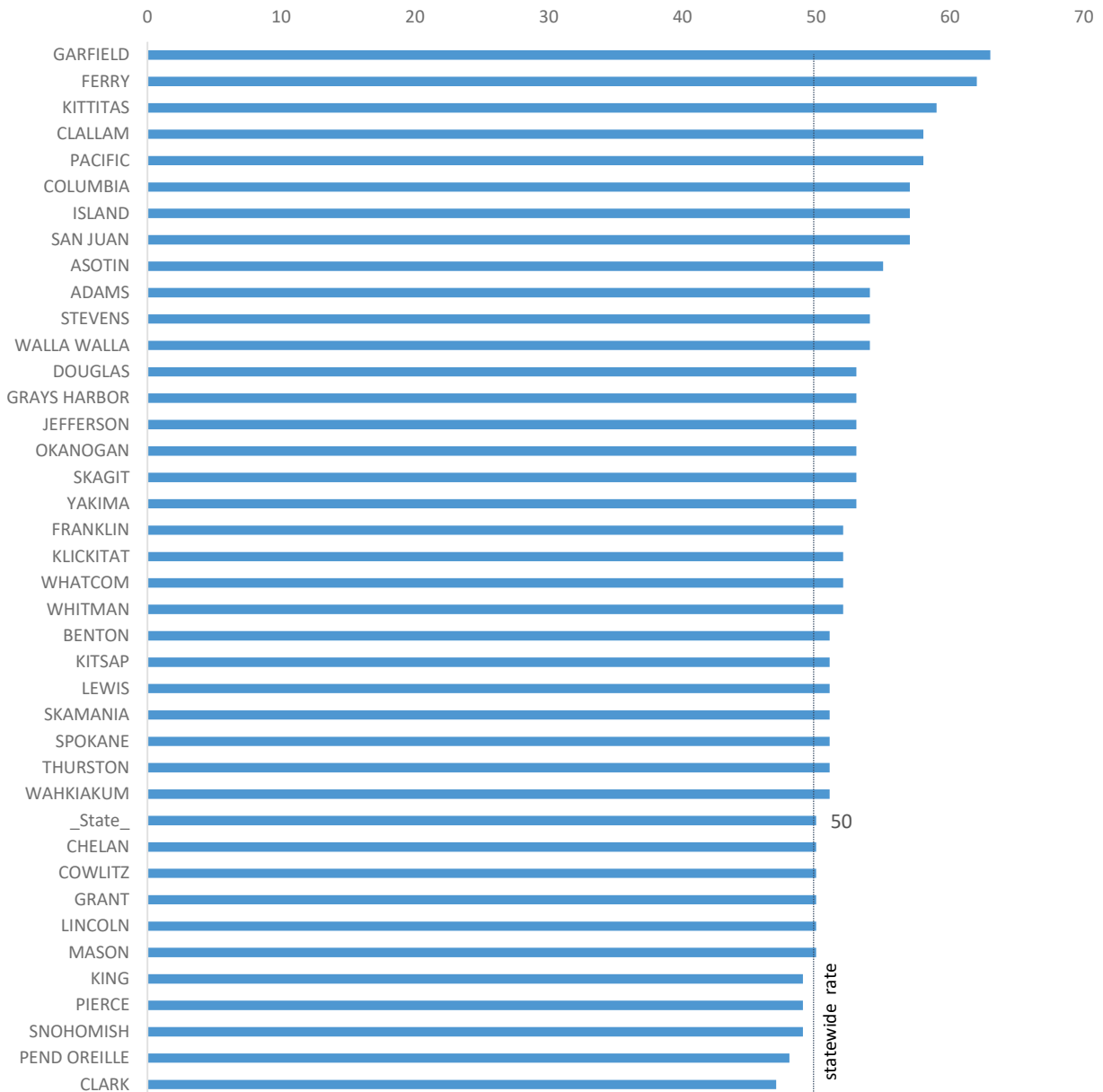
Map 3. Overall Physicians per 100,000 Population, Counties, 2016



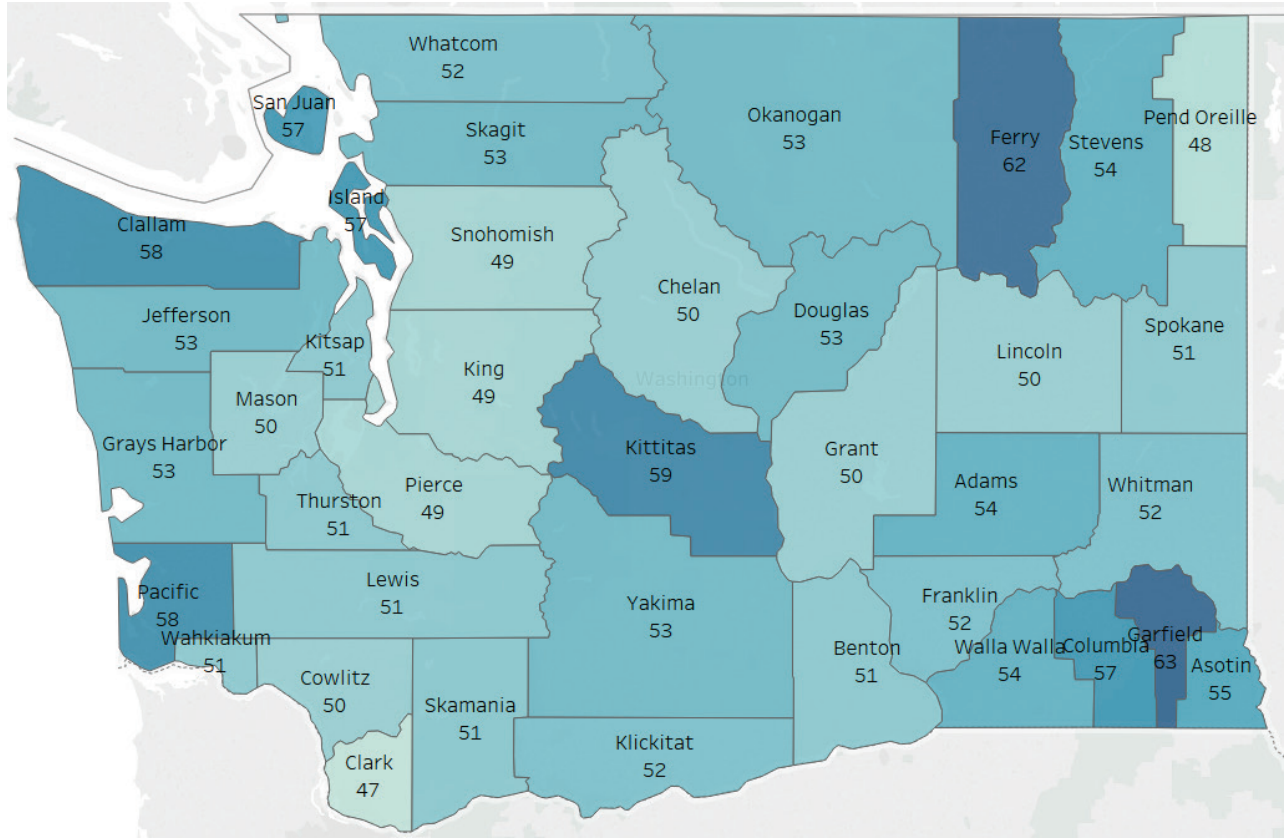
### County – Age of Physicians

The median age of the state's physicians in 2016 was 50. The median age of physicians among the counties ranged from 47 (Clark) to 63 (Garfield). For most counties (29), physician median age was above 50. In only five counties was the median physician age below 50: King, Pierce, Snohomish, Pend Oreille and Clark. All of these counties, except for Pend Oreille, were large and urban.

Chart 17. Ranking of Physician Median Age by County, 2016



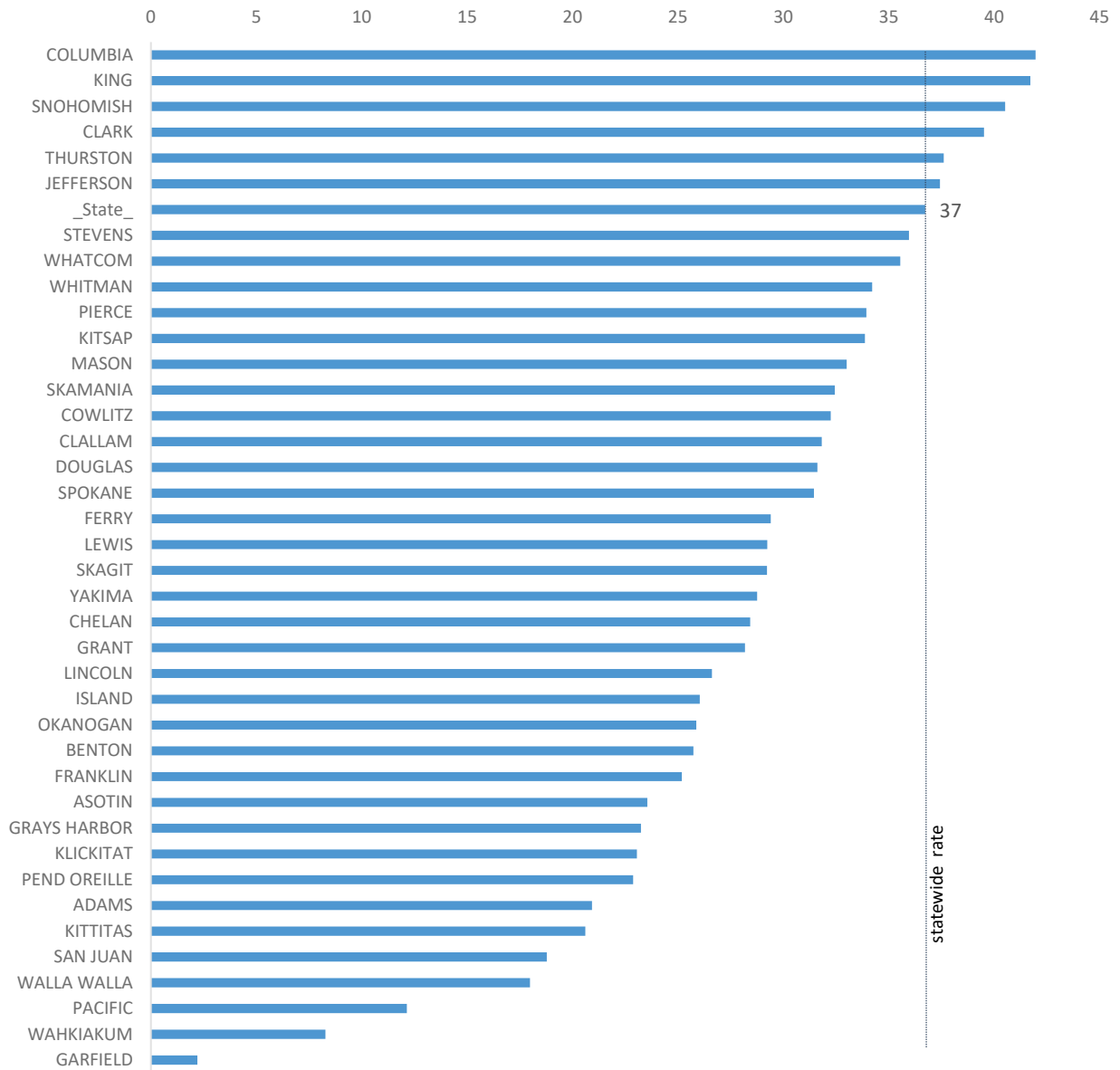
Map 4. Median Age of Physicians, Counties, 2016



### County – Percentage of Female Physicians

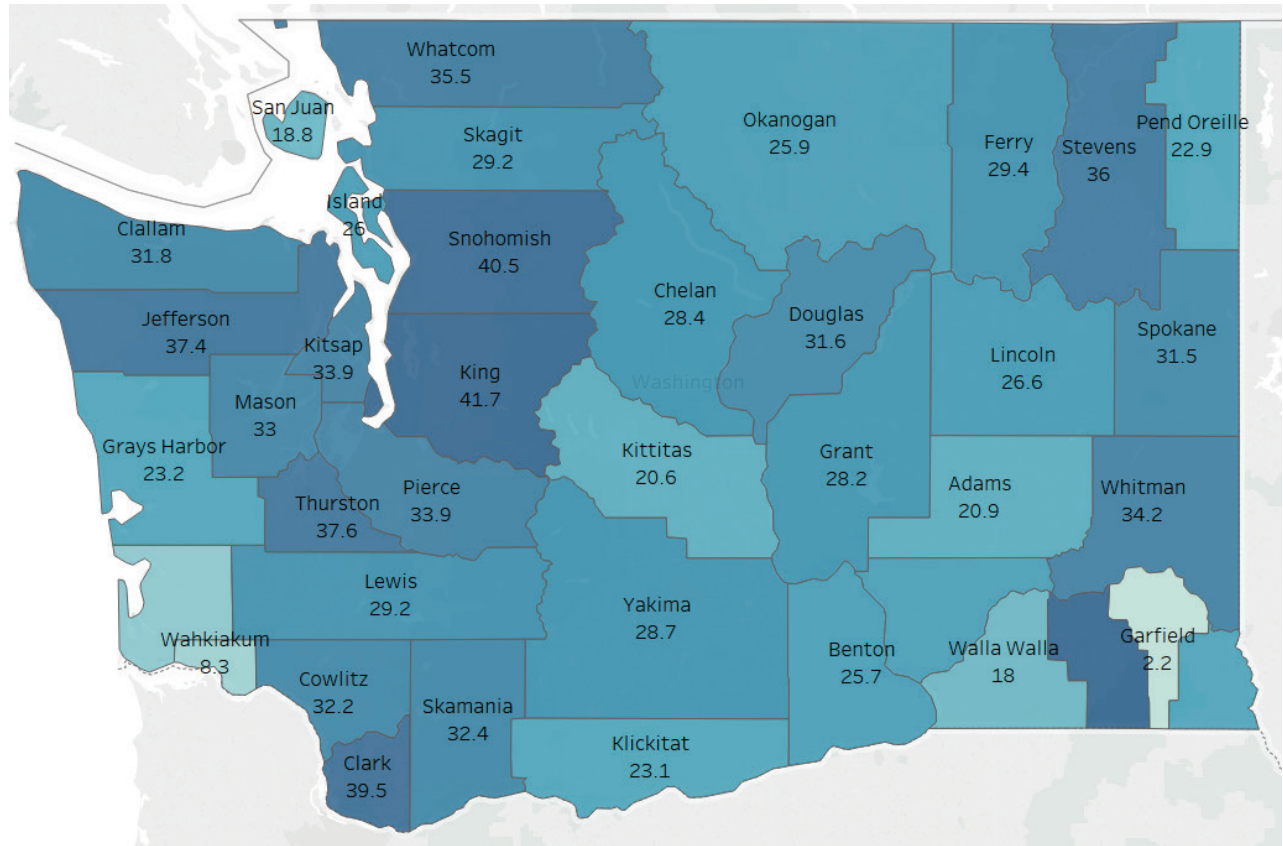
The percentage of female physicians in each county ranged from 2 percent in Garfield County to 42 percent in Columbia County. Statewide, the average was 37 percent. In addition to Columbia, the counties with more than 37 percent female physicians include King, Snohomish, Clark, Thurston and Jefferson.

Chart 18. Ranking of Female Physician Percentages by County, 2016





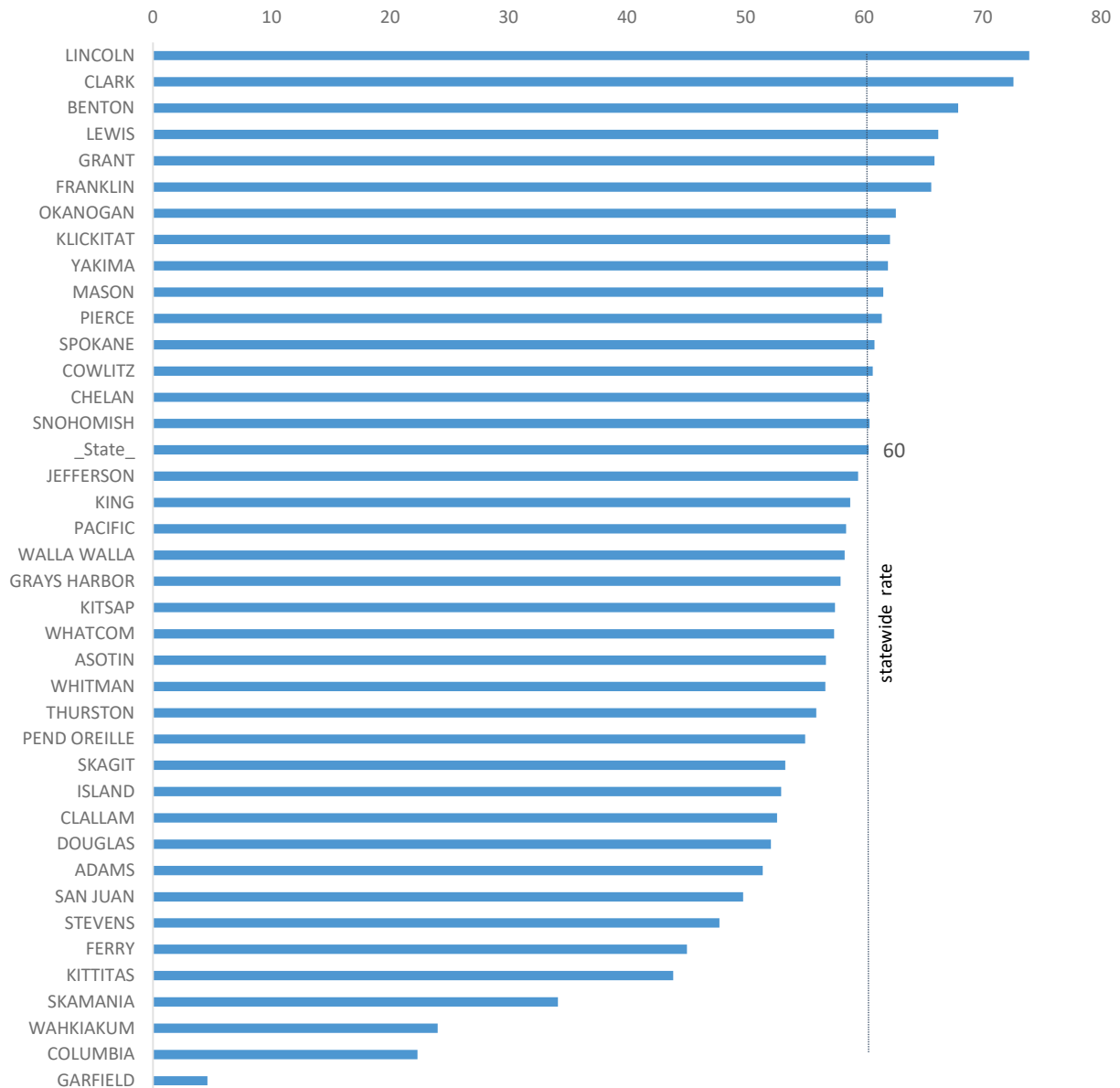
Map 5. Percentage of Female Physicians, Counties, 2016



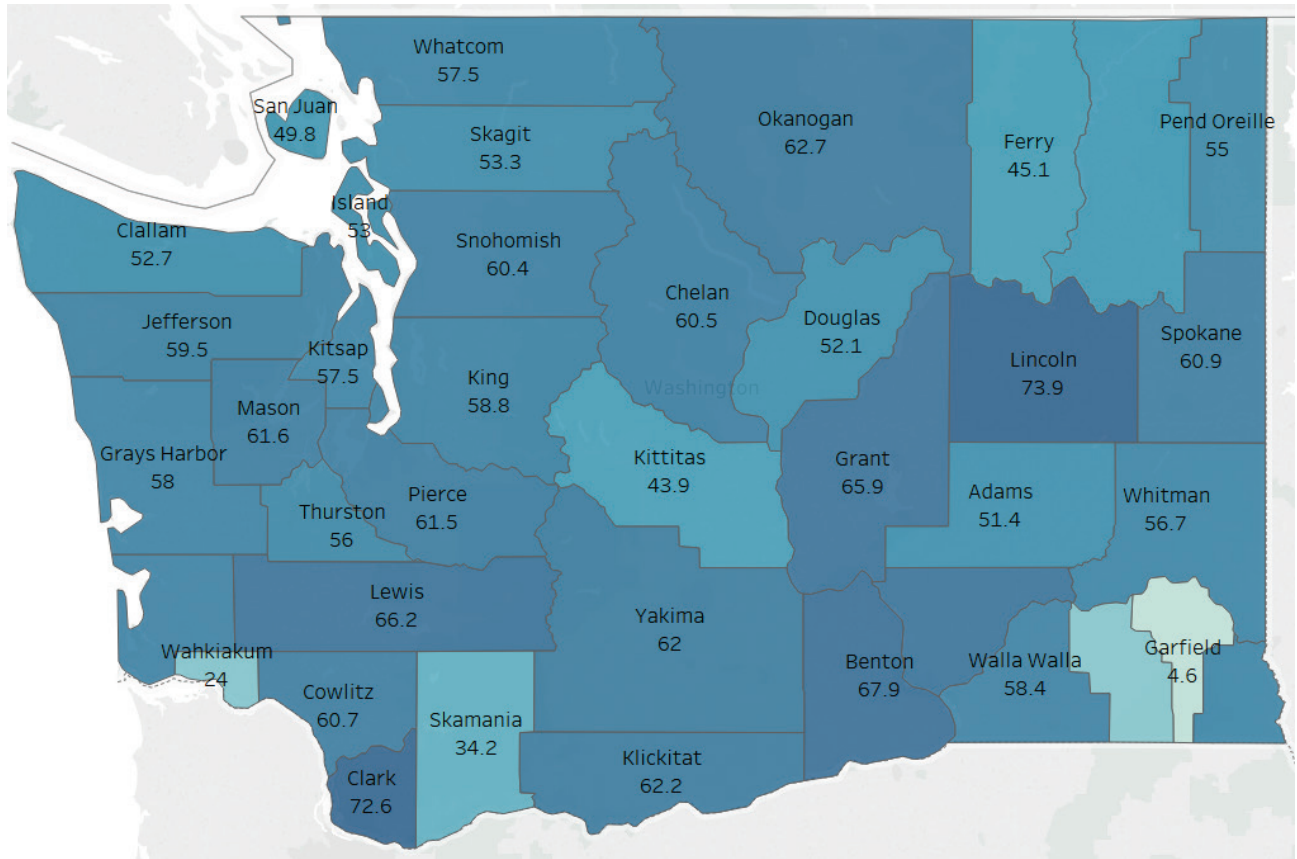
### County – Percentage of Physicians Licensed Since 2000

Statewide, 60 percent physicians obtained their first Washington licenses since 2000. For most counties, the share of physicians licensed since 2000 varied slightly from the statewide percentage. However, in Lincoln and Clark counties, their shares exceeded 70 percent. On the opposite end, seven counties had less than 50 percent of their physicians licensed since 2000. Garfield County's share of 5 percent was the lowest.

Chart 19. Ranking of Percentages of Physicians Licensed Since 2000 by County, 2016



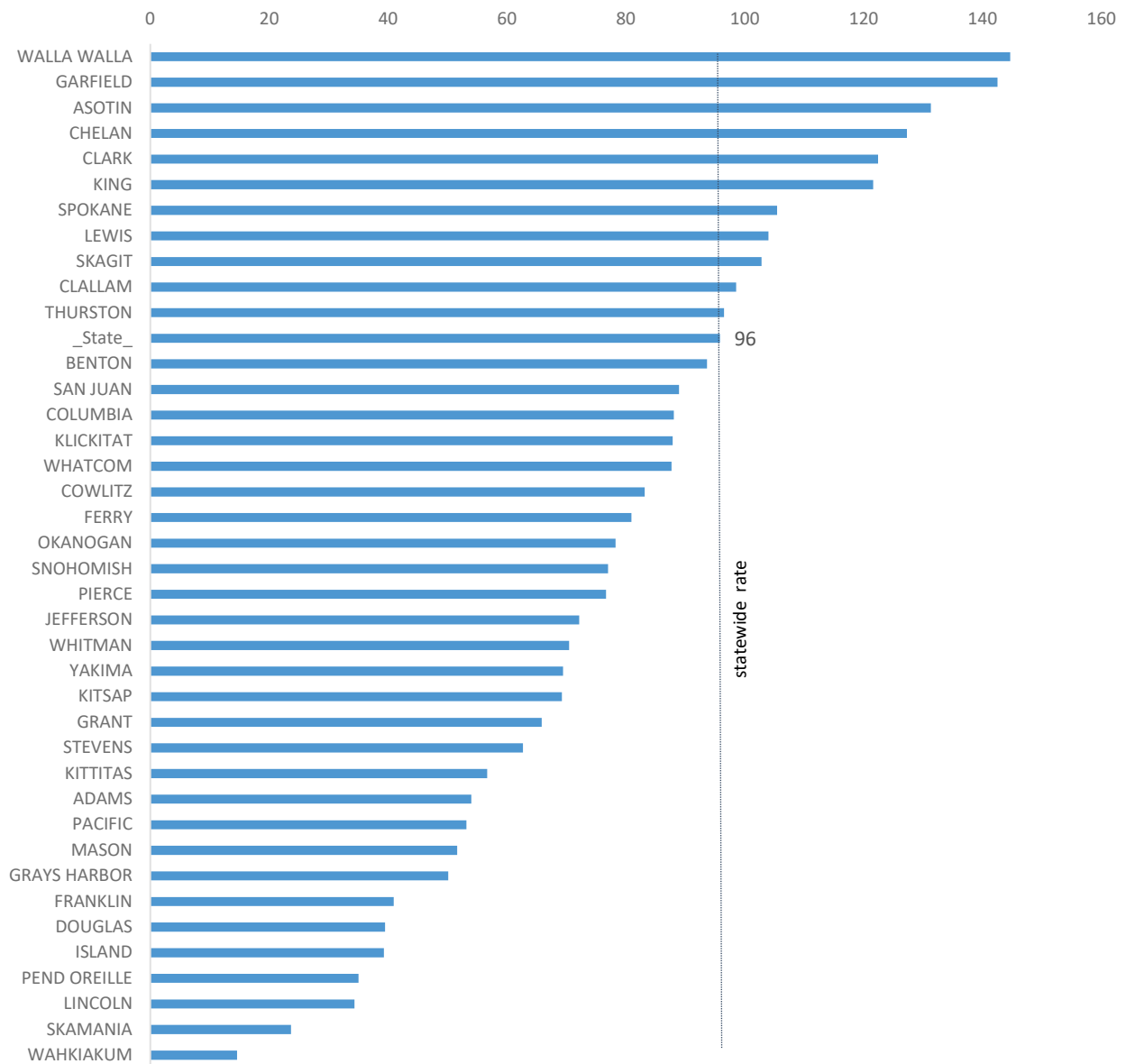
Map 6. Percentage of Physicians Licensed Since 2000, Counties, 2016



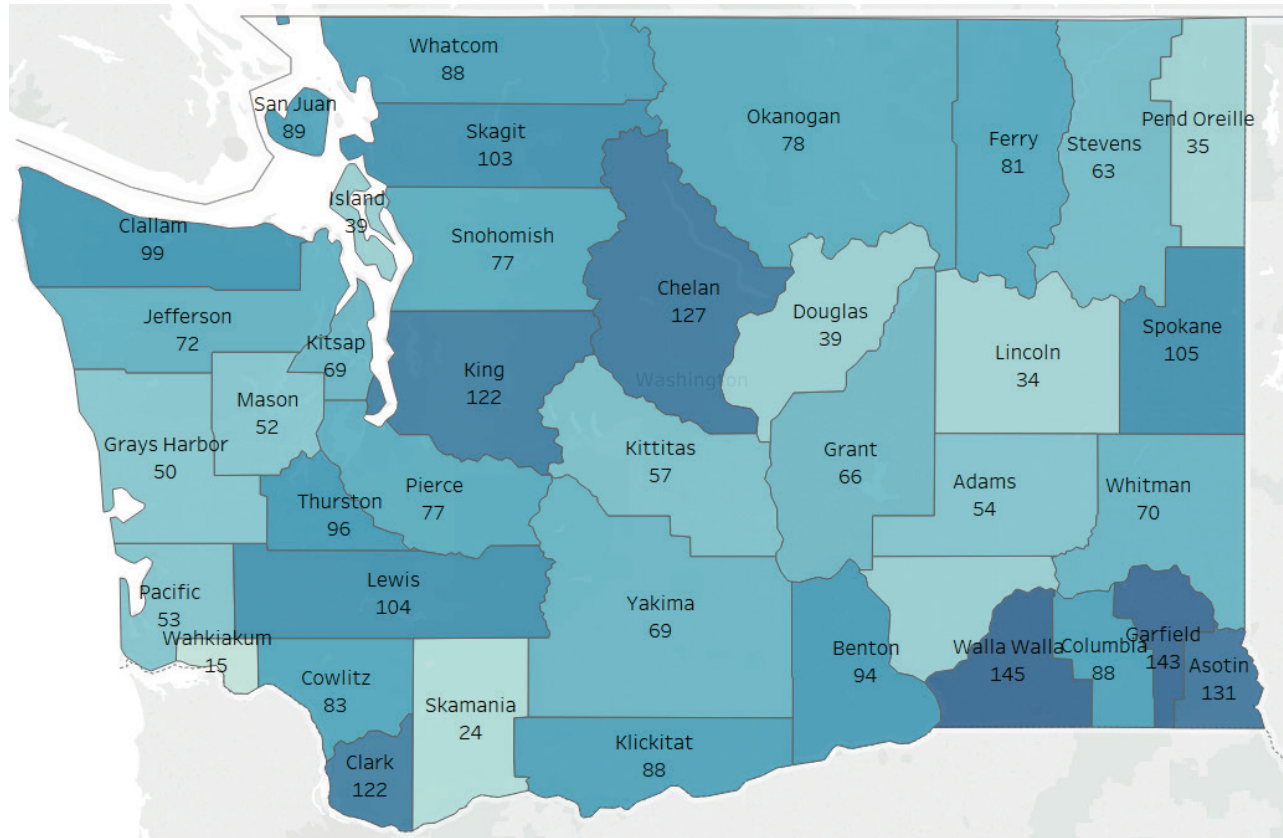
### County – Supply of PCPs

A large disparity existed in PCP supplies among the counties. Walla Walla County had the highest PCP rate of 145 per 100,000 population and Wahkiakum County had the lowest rate of 15. The state rate was 96. While the high-low difference in PCP supply is not as large as the difference observed in the overall physician supply, Walla Walla County’s rate is nonetheless nearly 10 times as large as Wahkiakum County’s rate. Eleven counties had PCP rates above the state rate. Again, those counties include some large counties and some smaller counties. The three large counties were once again Clark, King and Spokane. The eight smaller counties were Asotin, Chelan, Garfield, Lewis, Clallam, Skagit, Thurston and Walla Walla.

Chart 20. Ranking of PCP Rates (per 100,000) by County, 2016



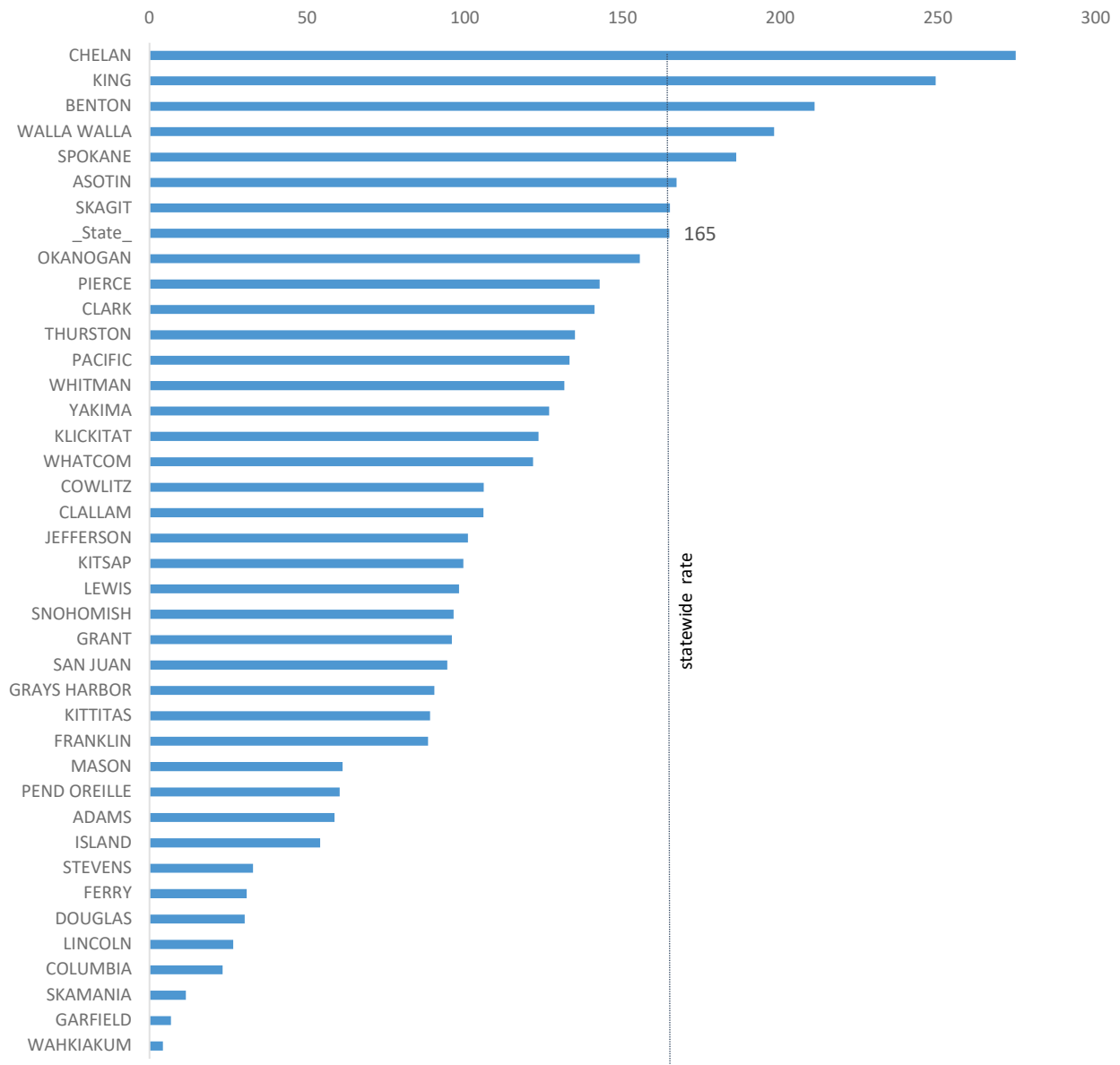
Map 7. PCPs per 100,000 Population, Counties, 2016



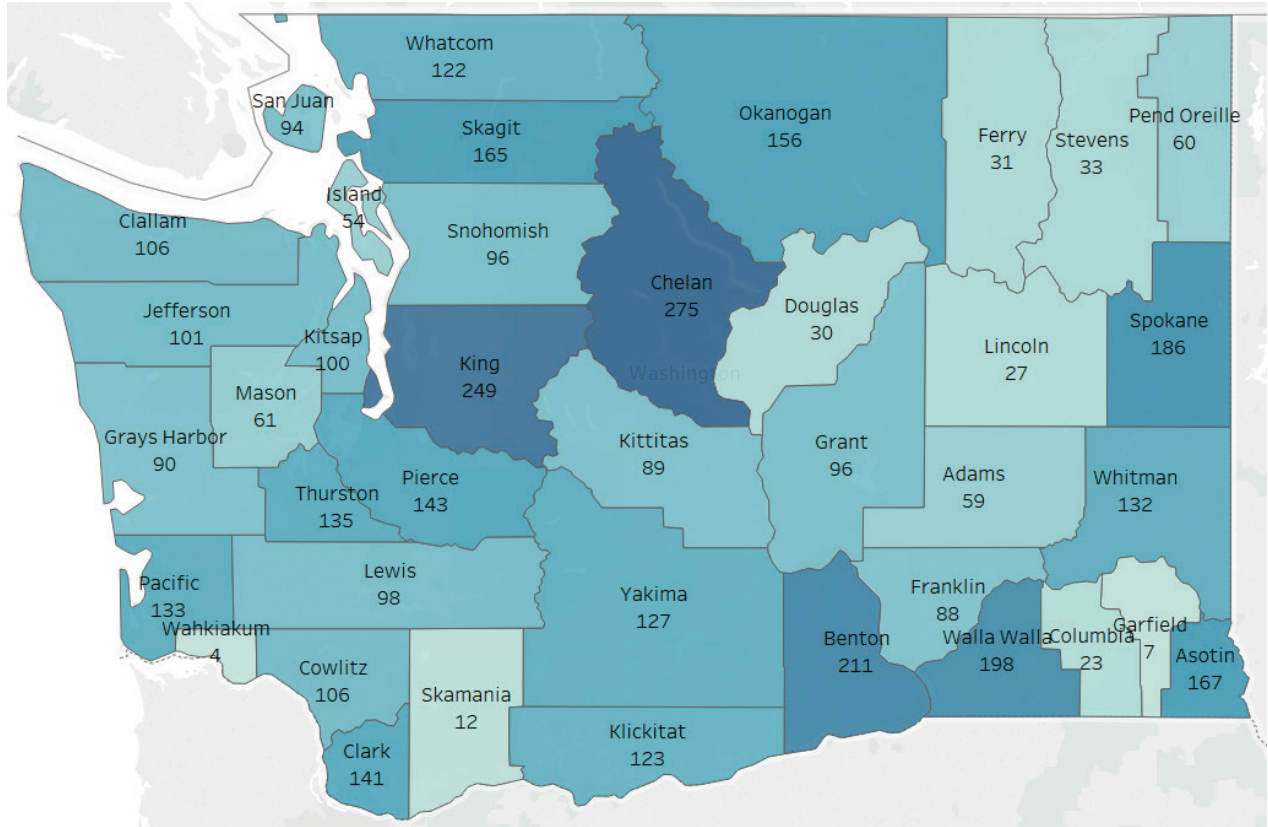
### County – Supply of Specialists

While the statewide specialist rate per 100,000 population was 165 in 2016, only seven counties reached that level. Chelan had the highest rate (275), followed by King, Benton, Walla Walla, Spokane, Asotin and Skagit. Most counties had specialist rates below 100 per 100,000 population. Wahkiakum County had the state’s lowest rate with fewer than 5 specialists per 100,000 population. The distribution of specialists resulted in the largest disparities among the counties where the highest rate is more than 65 times greater than the lowest rate. While the counties with the highest specialist rates were not necessary large urban counties, counties with the lowest rates (fewer than 50 physicians per 100,000) were all small and rural.

Chart 21. Ranking of Specialist Rates (per 100,000) by County, 2016



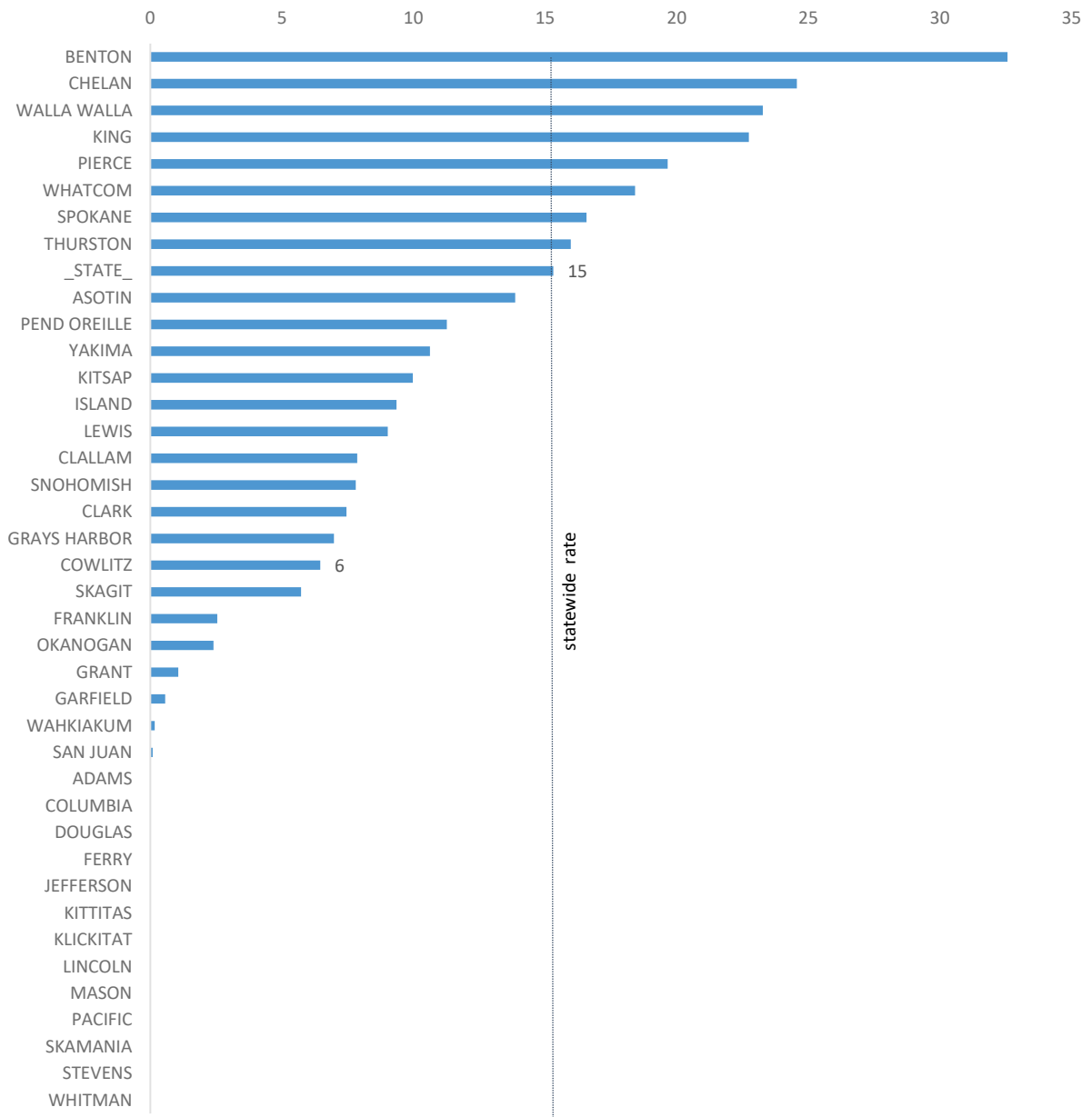
Map 8. Specialists per 100,000 Population, Counties, 2016



### County – Supply of Anesthesiologists

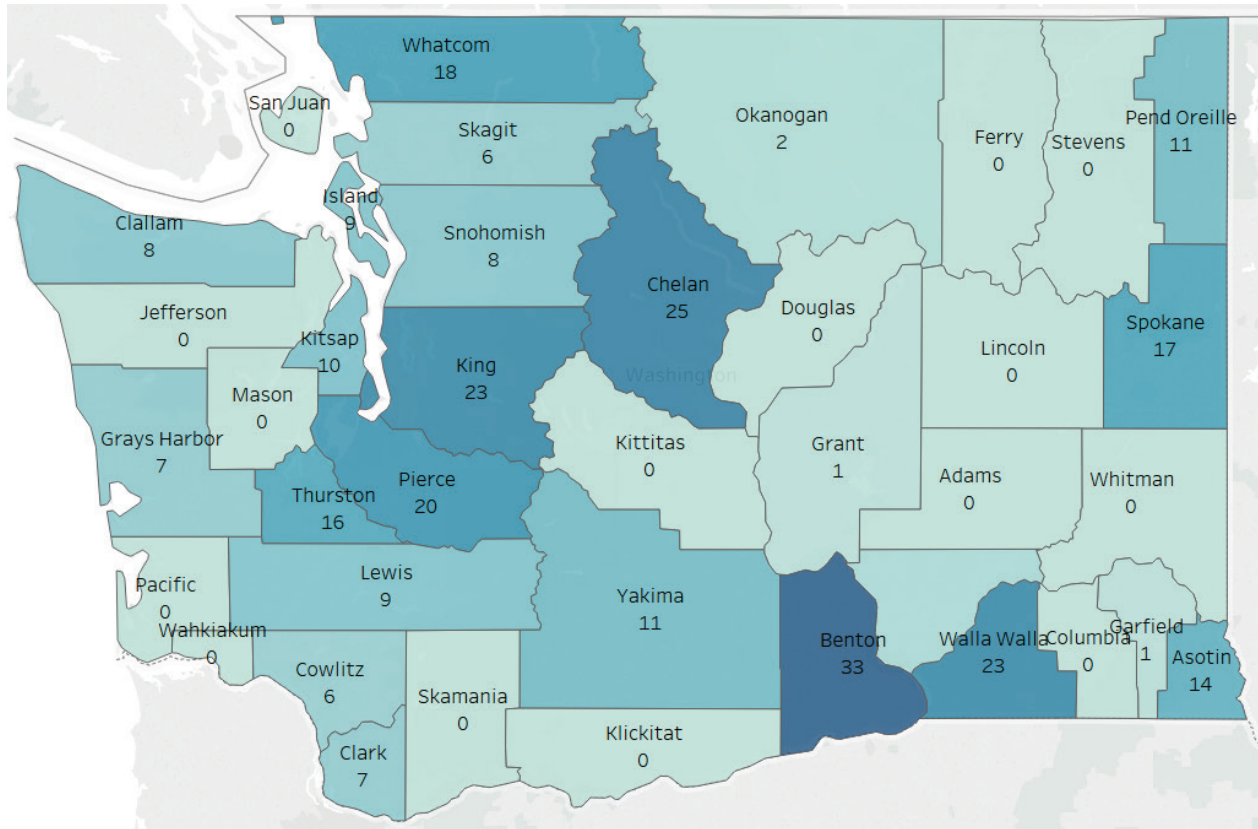
Benton County led the other counties in anesthesiologists per 100,000 population. Benton’s rate of 33 is more than twice as large as the state average of 15. In addition to Benton, counties with rates of anesthesiologists exceeding that of the state average included Chelan, Walla Walla, King, Pierce, Whatcom, Spokane and Thurston. More than one third of counties (15) had no anesthesiologists.

Chart 22. Ranking of Anesthesiologist Rates (per 100,000) by County, 2016





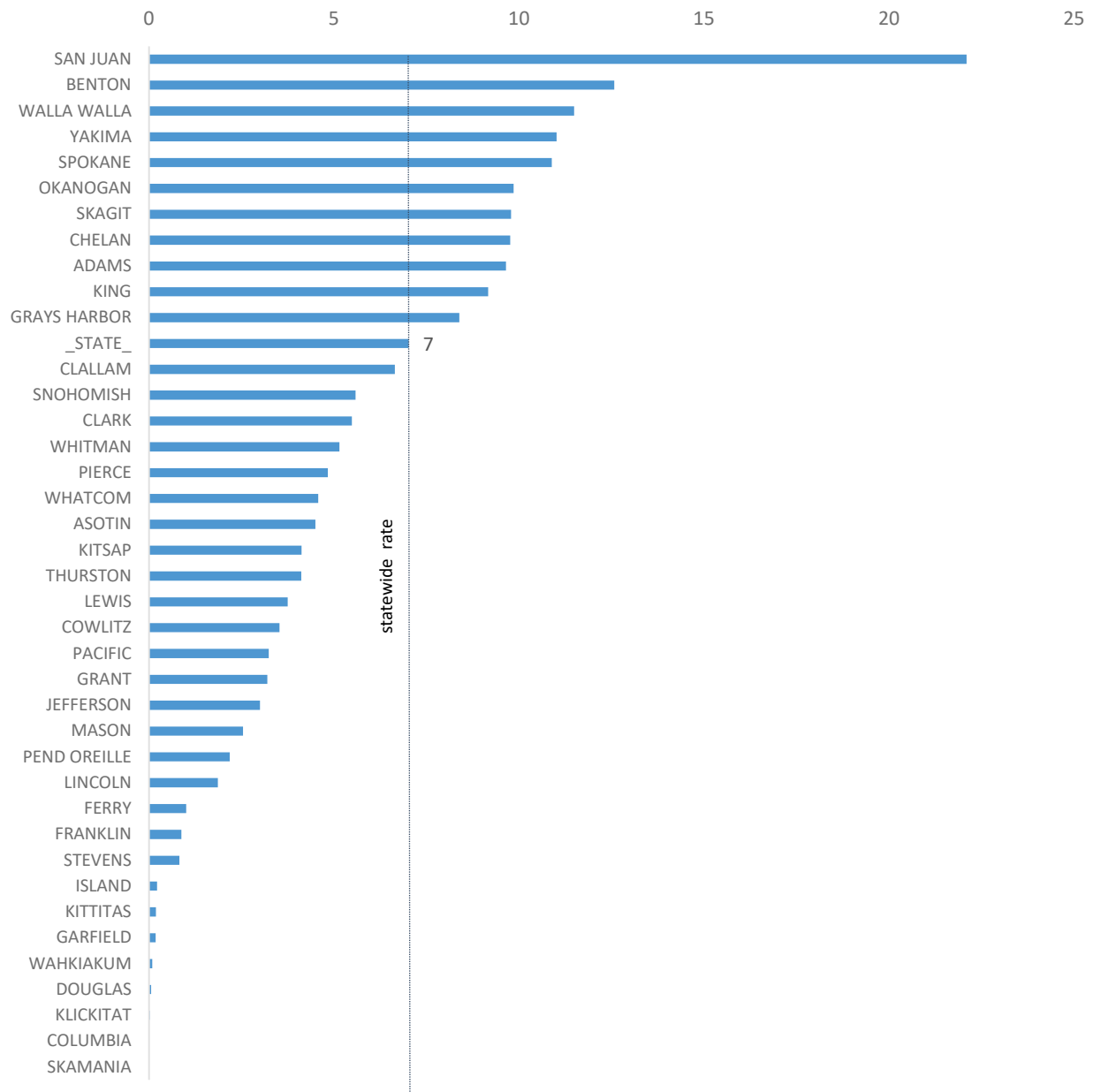
Map 9. Anesthesiologists per 100,000 Population, Counties, 2016



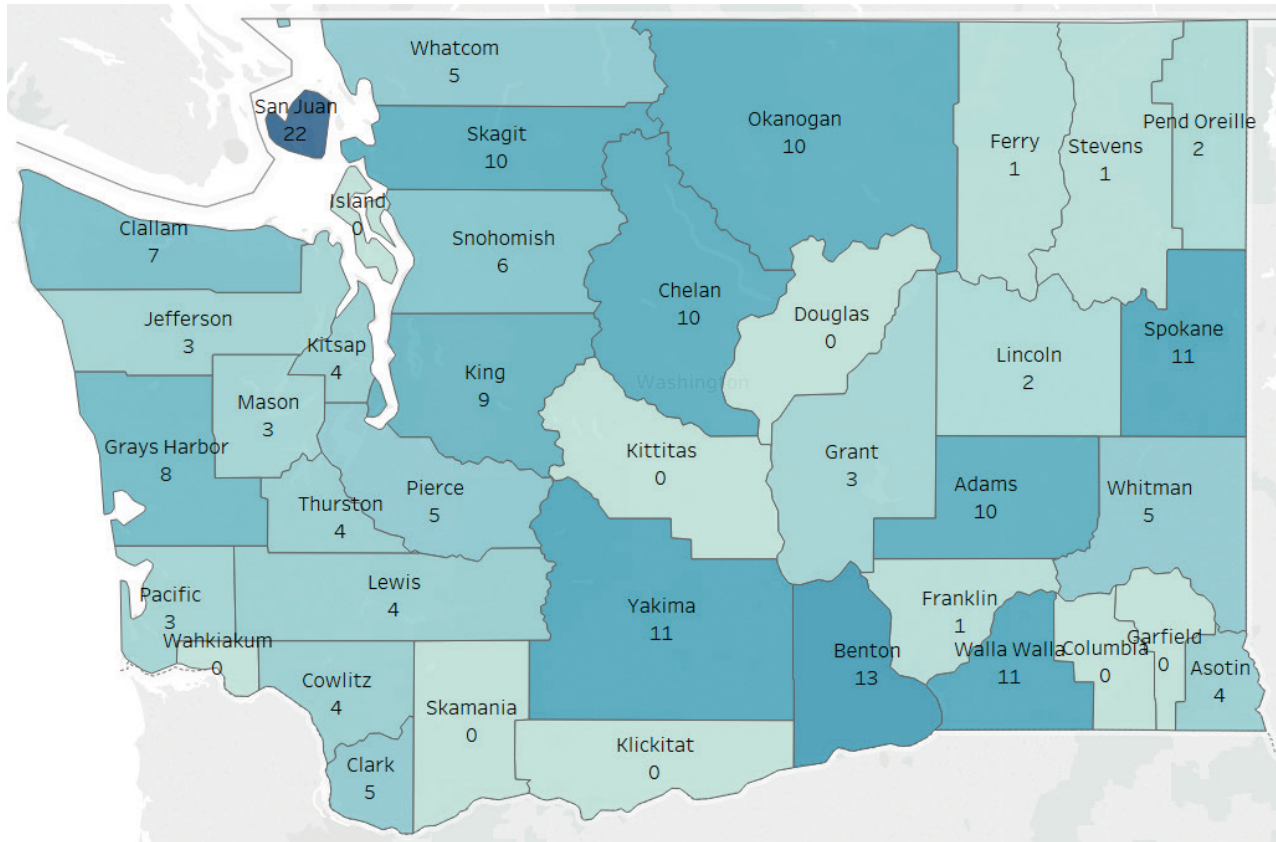
### County – Supply of Cardiologists

San Juan County had the highest cardiologist rate, 22 physicians per 100,000 population. Its rate is three times as large as the state average rate of seven cardiologists per 100,000 population. The county with the second highest rate is Benton, 13 per 100,000. Nine other counties also had rates greater than the state average rate, including large urban counties such as King and small counties such as Adams. Eleven counties, all small, had rates of fewer than 2 cardiologists per 100,000 population.

Chart 23. Ranking of Cardiologist Rates (per 100,000) by County, 2016



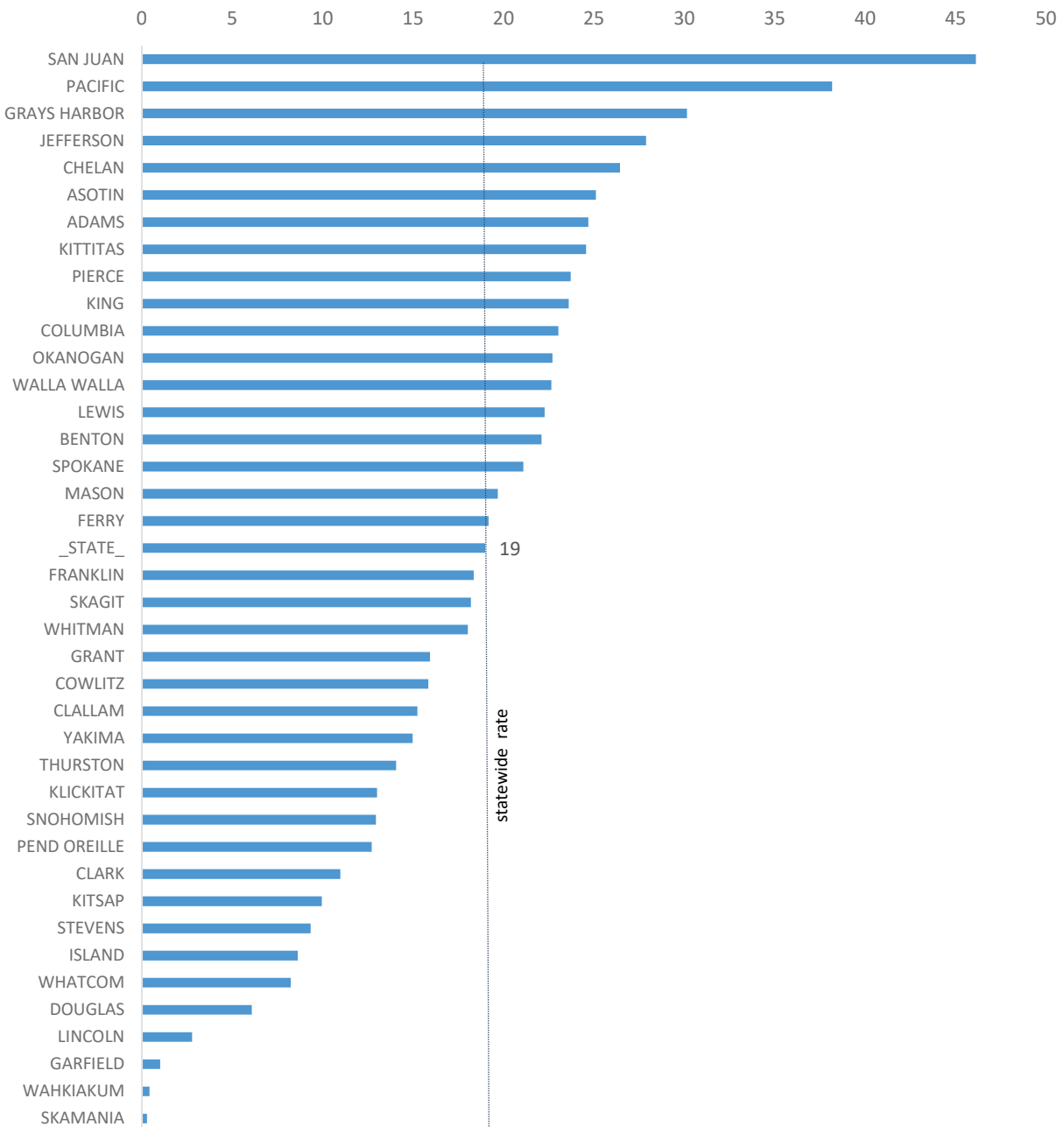
Map 10. Cardiologists per 100,000 Population, Counties, 2016



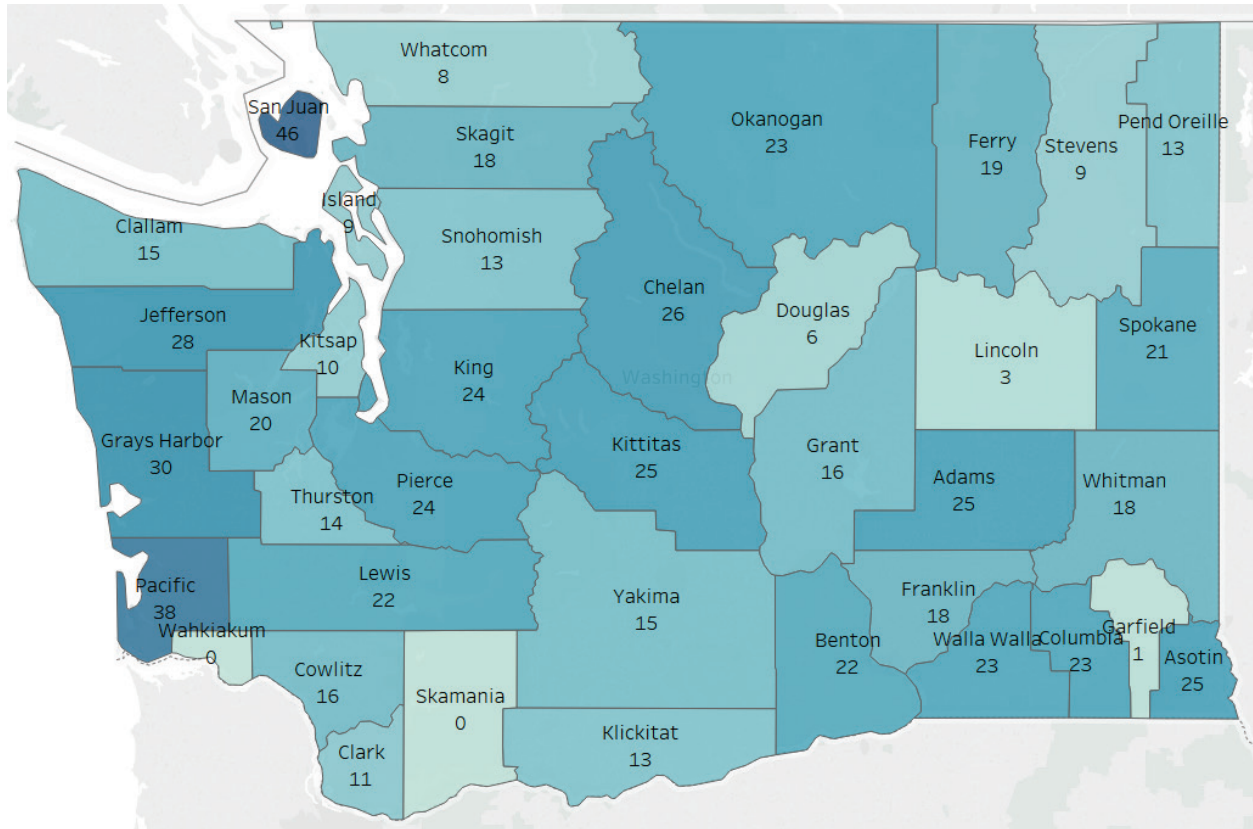
### County – Supply of Emergency Medicine Physicians

For the state, the rate of emergency medicine physicians was 19 per 100,000 population. Approximately half the counties had emergency physician rates greater than the state average rate, led by San Juan County with the highest rate of 46. Four counties had rates lower than 5 emergency physicians per 100,000 population. These four counties are Lincoln, Garfield, Wahkiakum and Skamania.

Chart 24. Ranking of Emergency Medicine Physician Rates (per 100,000) by County, 2016



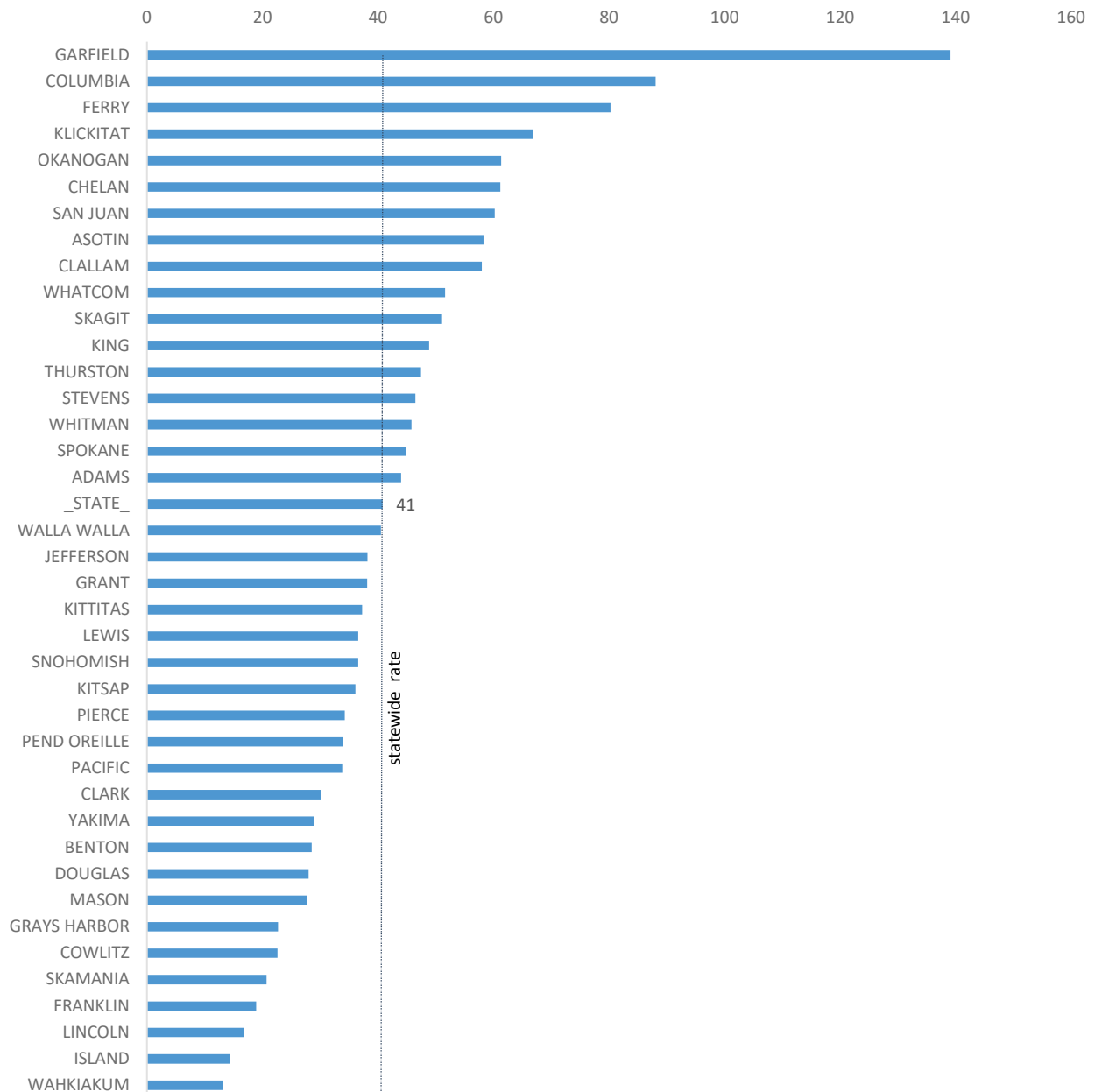
Map 11. Emergency Medicine Physicians per 100,000 Population, Counties, 2016



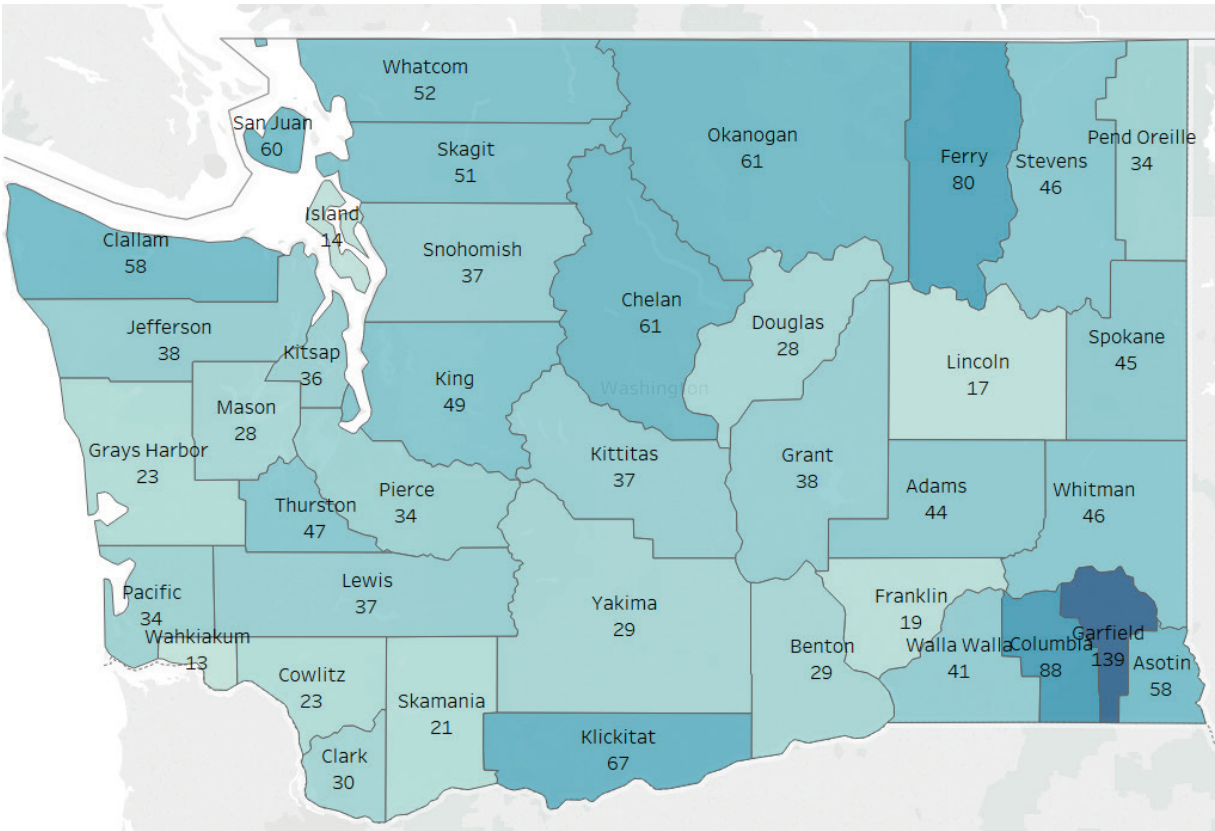
### County – Supply of Family Medicine Physicians

Most of the 17 counties with more than 41 family medicine physicians per 100,000 population (the state rate) were small and rural counties. Garfield had the highest rate, 139 per 100,000, by far. Columbia County was a distant second, with a rate of 88 per 100,000. Garfield's rate was more than 10 times as high as the lowest rate of 10 family physicians per 100,000 population (Wahkiakum).

Chart 25. Ranking of Family Medicine Physician Rates (per 100,000) by County, 2016



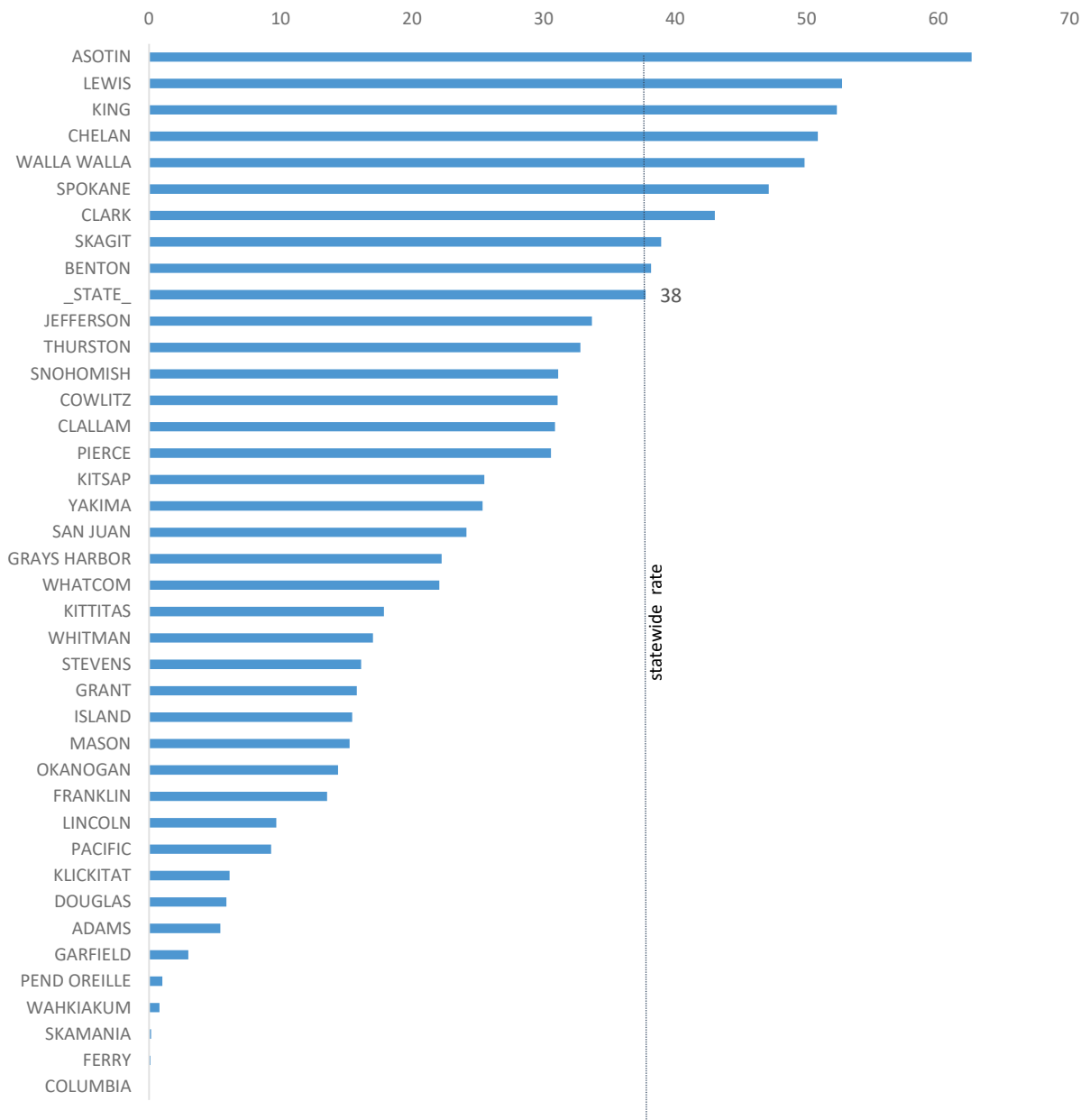
Map 12. Family Medicine Physicians per 100,000 Population, Counties, 2016



### County – Supply of Internal Medicine Physicians

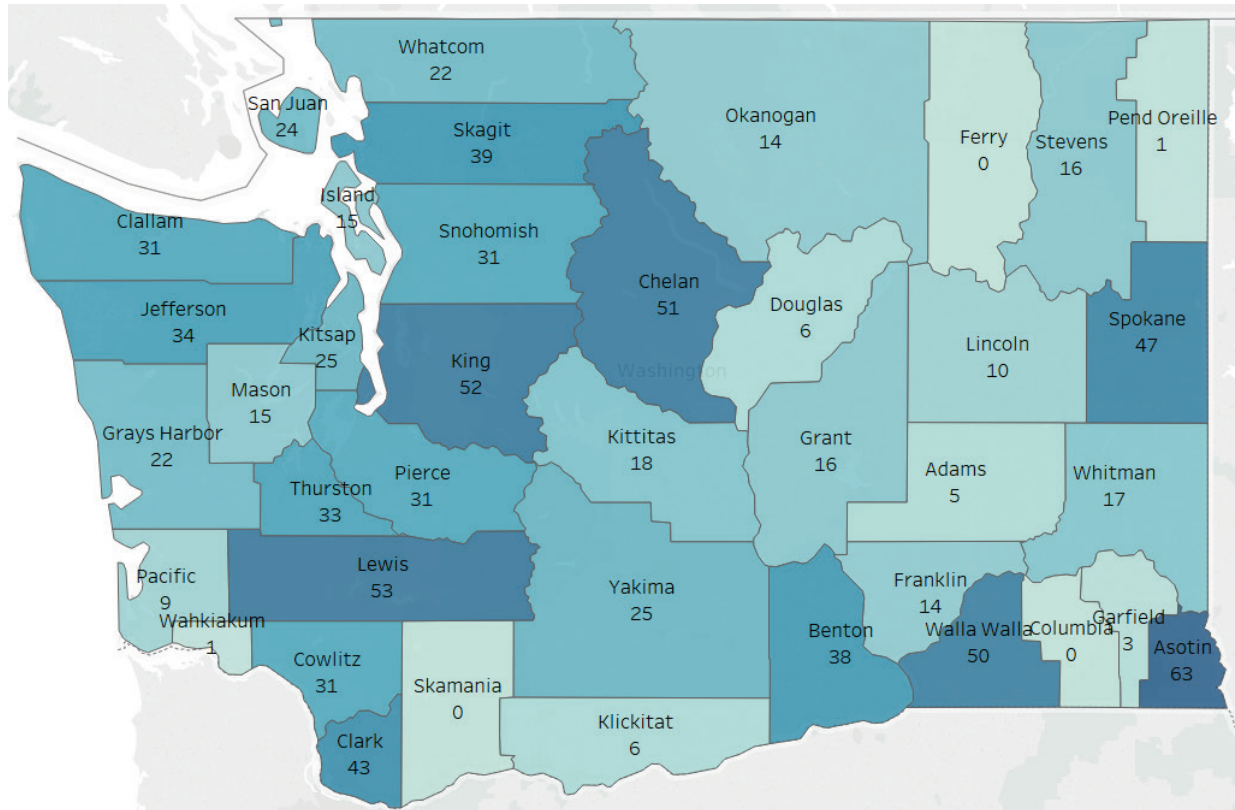
Asotin County led all other counties in the rate of internal medicine physicians per 100,000 population. Its rate of 63 physicians per 100,000 population is about 66 percent higher than the state rate of 38 physicians per 100,000 population. Besides Asotin, eight other counties had internal medicine physician rates higher than the state rate: Lewis, King, Chelan, Walla Walla, Spokane, Clark, Skagit and Benton. Six small counties had rates below 5 internal medicine physicians per 100,000 population: Garfield, Pend Oreille, Wahkiakum, Skamania, Ferry and Columbia.

Chart 26. Ranking of Internal Medicine Physician Rates (per 100,000) by County, 2016





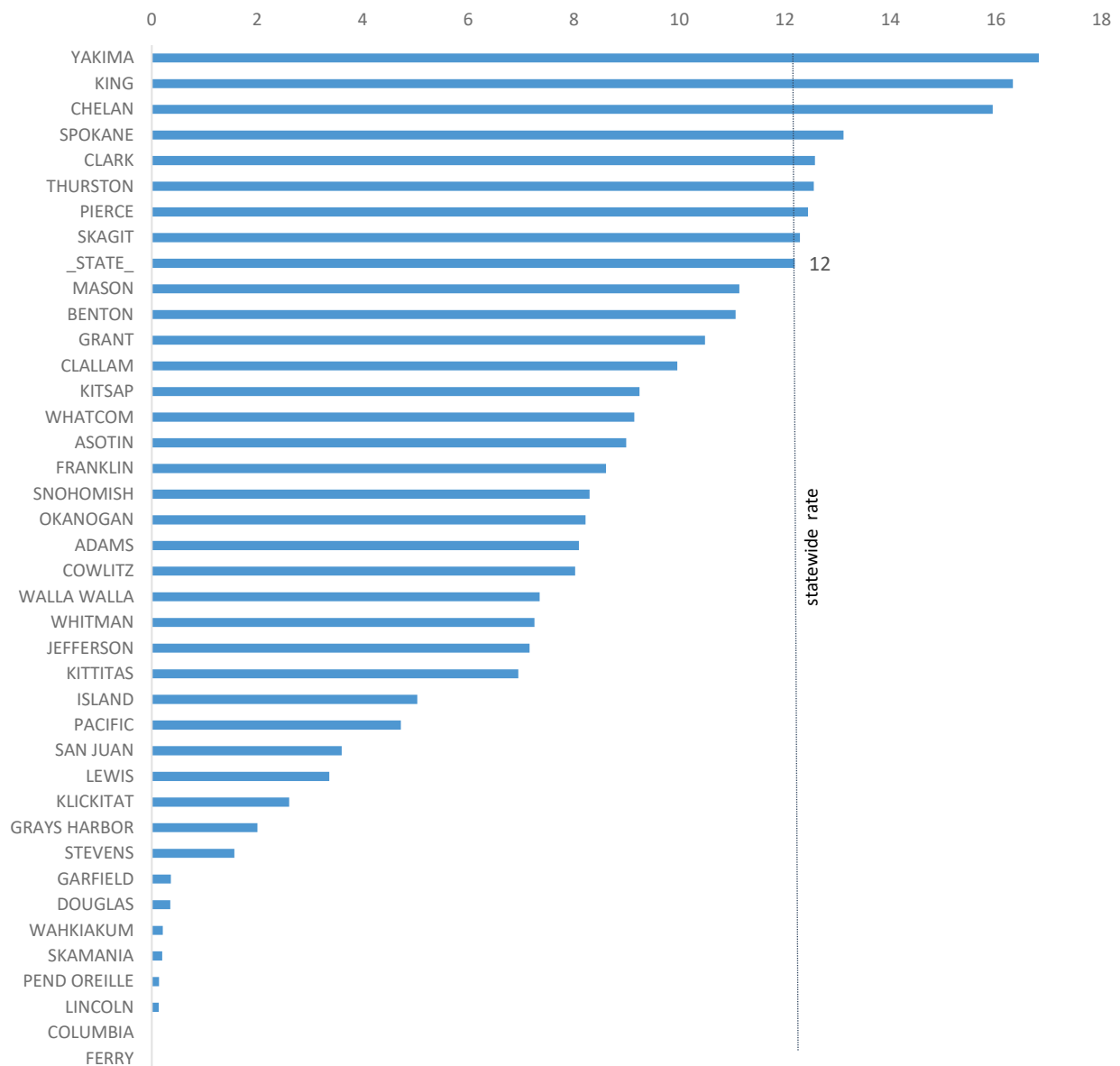
Map 13. Internal Medicine Physicians per 100,000 Population, Counties, 2016



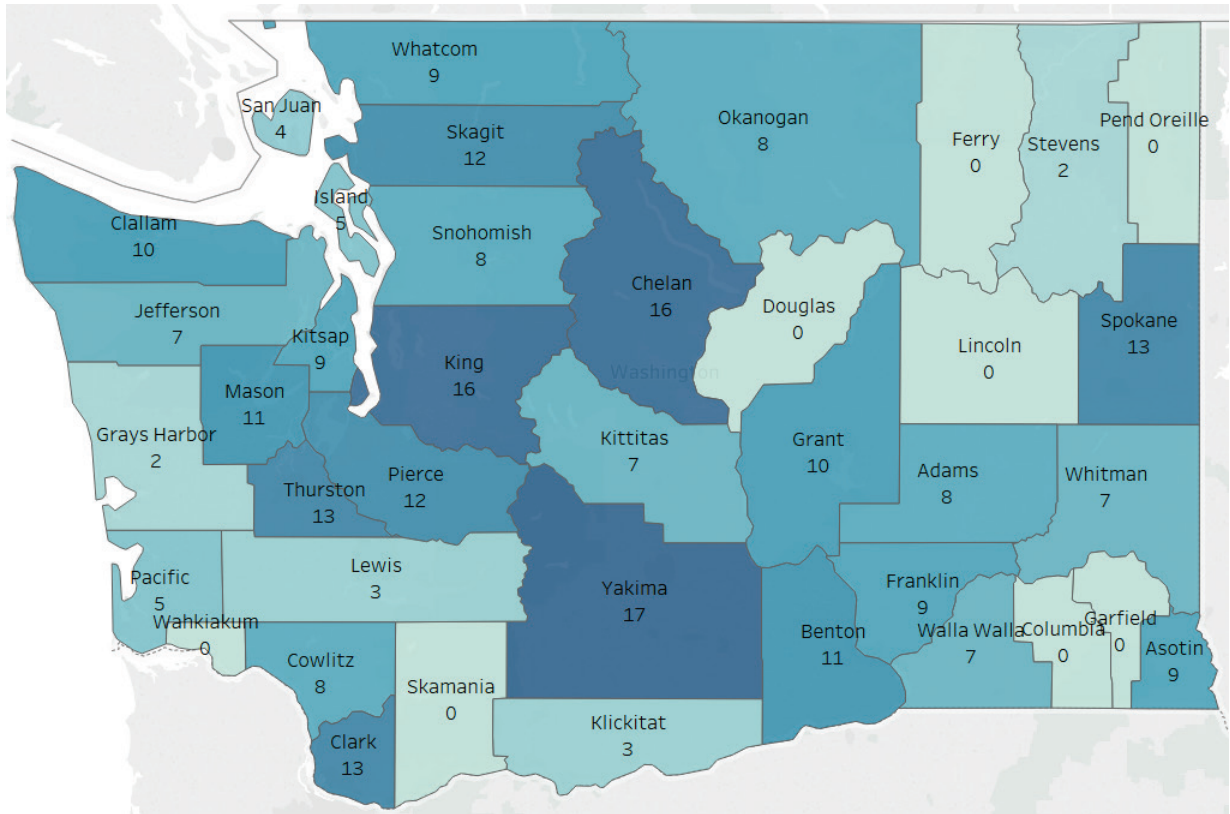
### County – Supply of OB/GYNs

Yakima, King and Chelan counties had the highest rates of OB/GYNs at over more than 15 per 100,000 population. All three were higher than the state rate of 12 OB/GYNs per 100,000 population. Five other counties, mostly large and urban, had OB/GYN rates slightly greater the state rate: Spokane, Clark, Thurston, Pierce and Skagit. One third of counties had fewer than five OB/GYNs per 100,000 population.

Chart 27. Ranking of OB/GYN Rates (per 100,000) by County, 2016



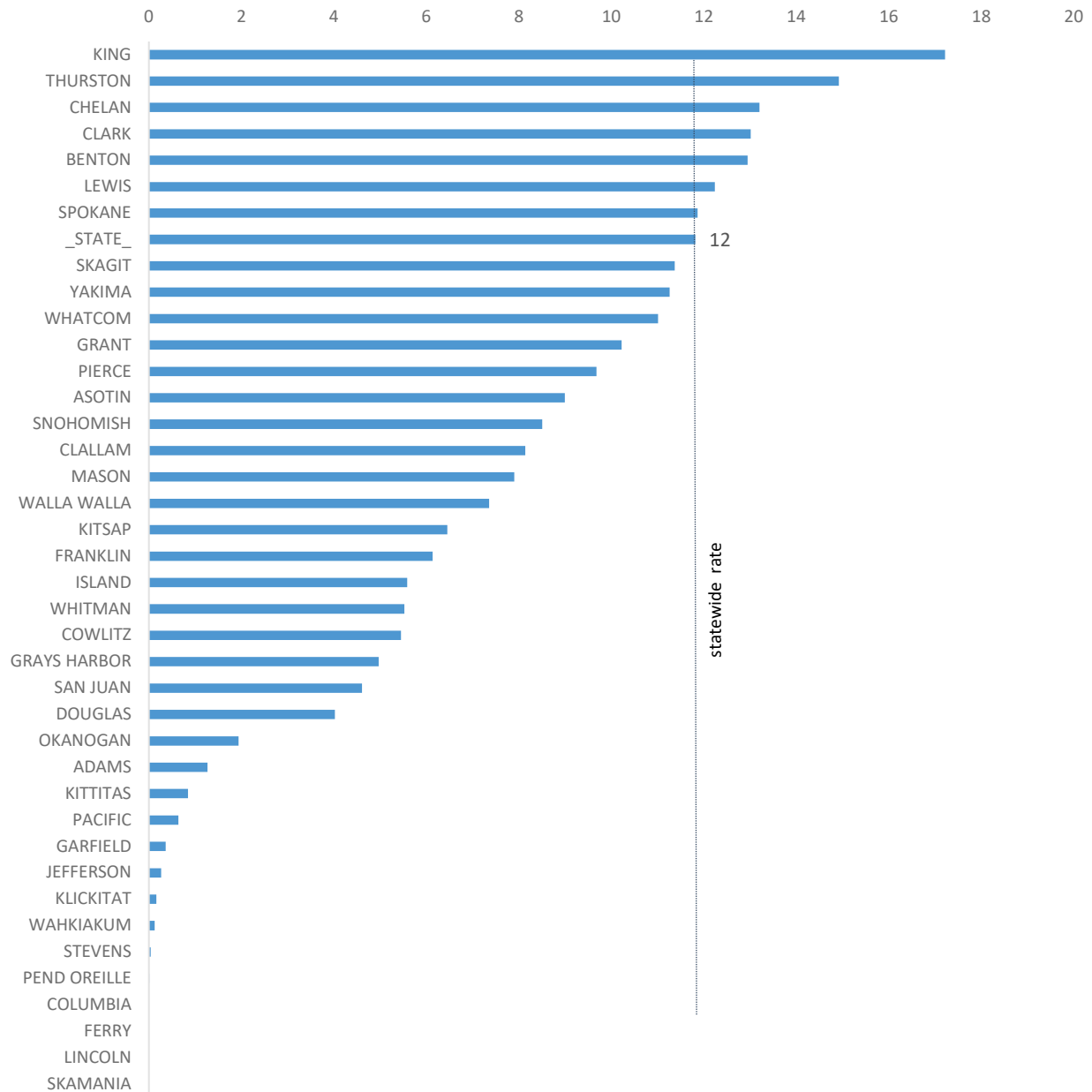
Map 14. OB/GYNs per 100,000 Population, Counties, 2016



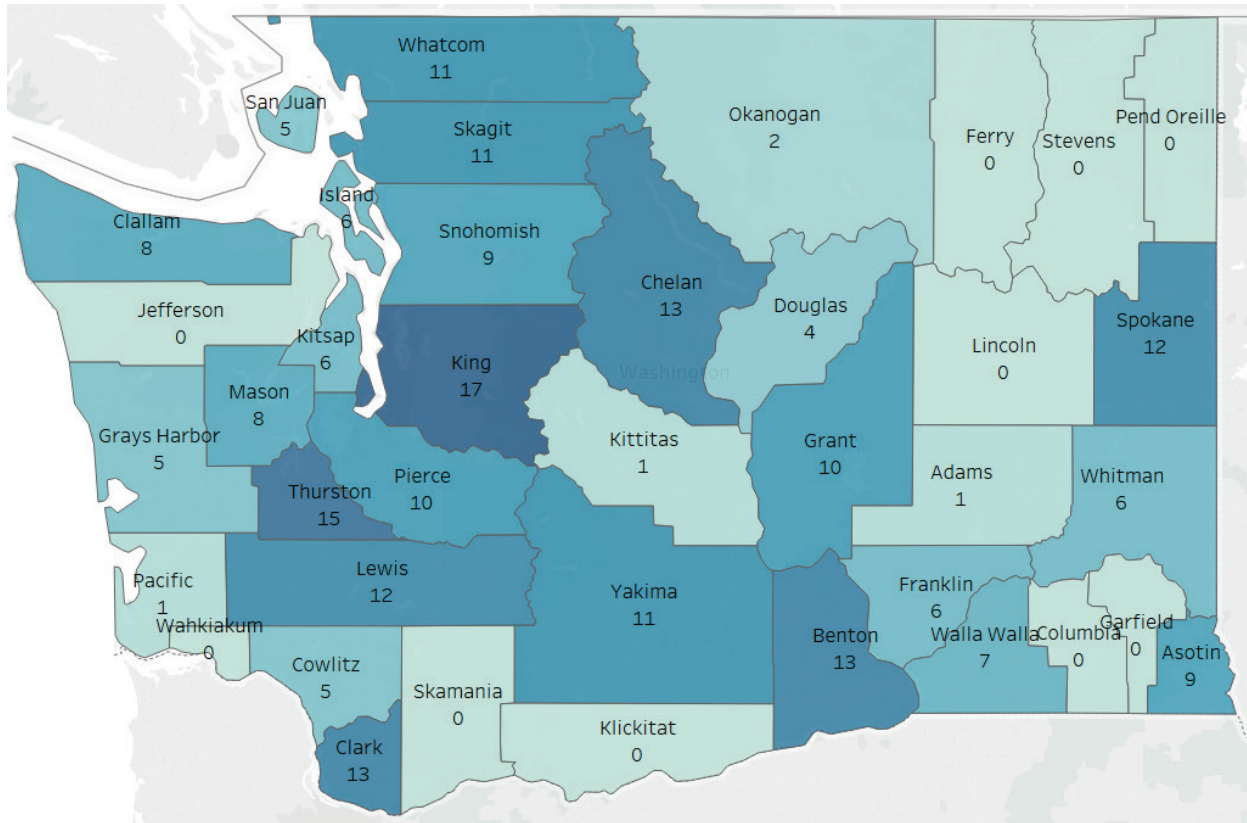
### County – Supply of Pediatricians

King County's rate of 17 pediatricians per 100,000 population was the highest of all counties. Only seven counties, including King, had pediatrician rates at or above the state average rate of 12 physicians per 100,000 population. A large number of counties, 15 in all, had fewer than five pediatricians per 100,000 population.

Chart 28. Ranking of Pediatrician Rates (per 100,000) by County, 2016



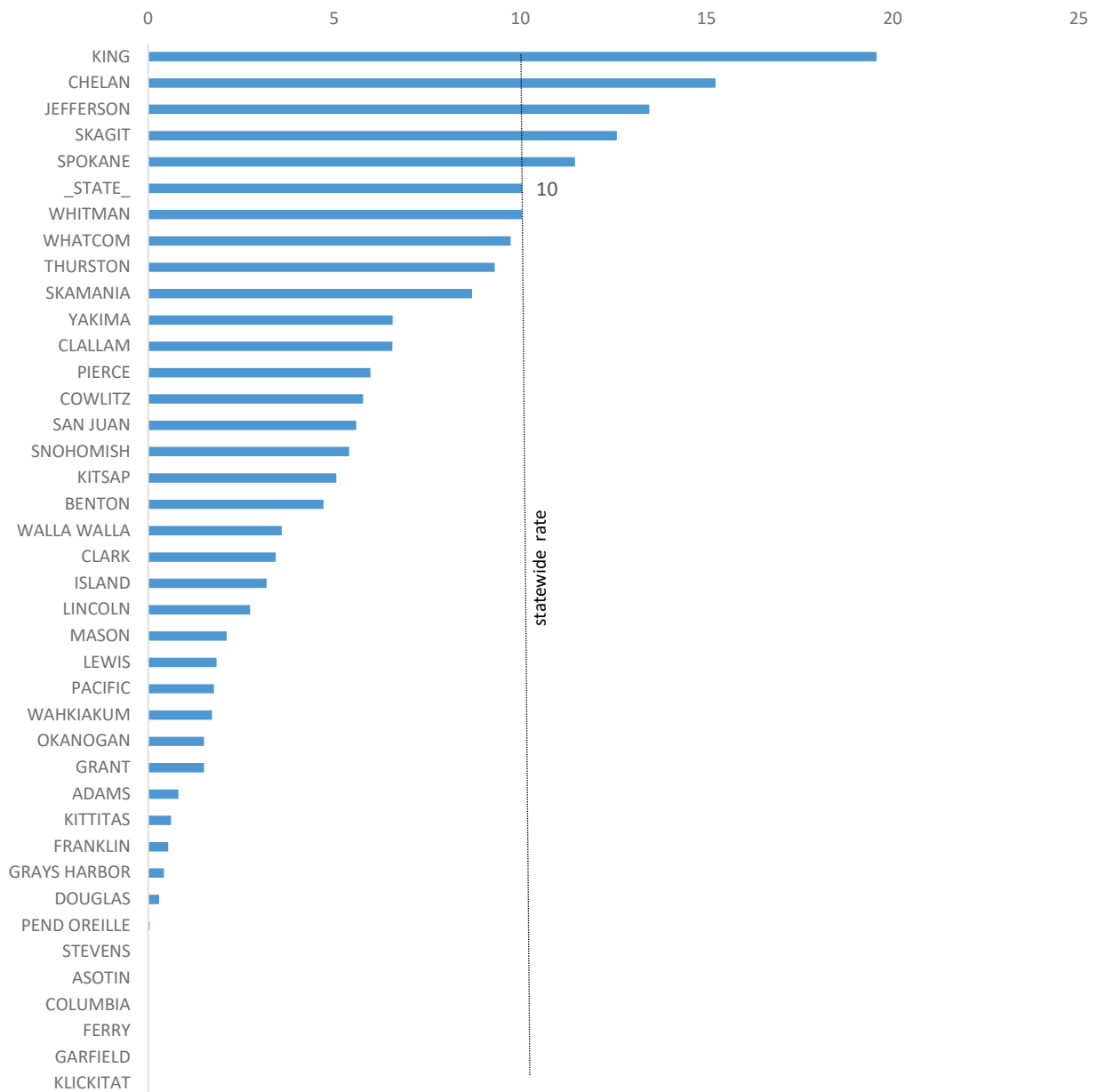
Map 15. Pediatricians per 100,000 Population, Counties, 2016



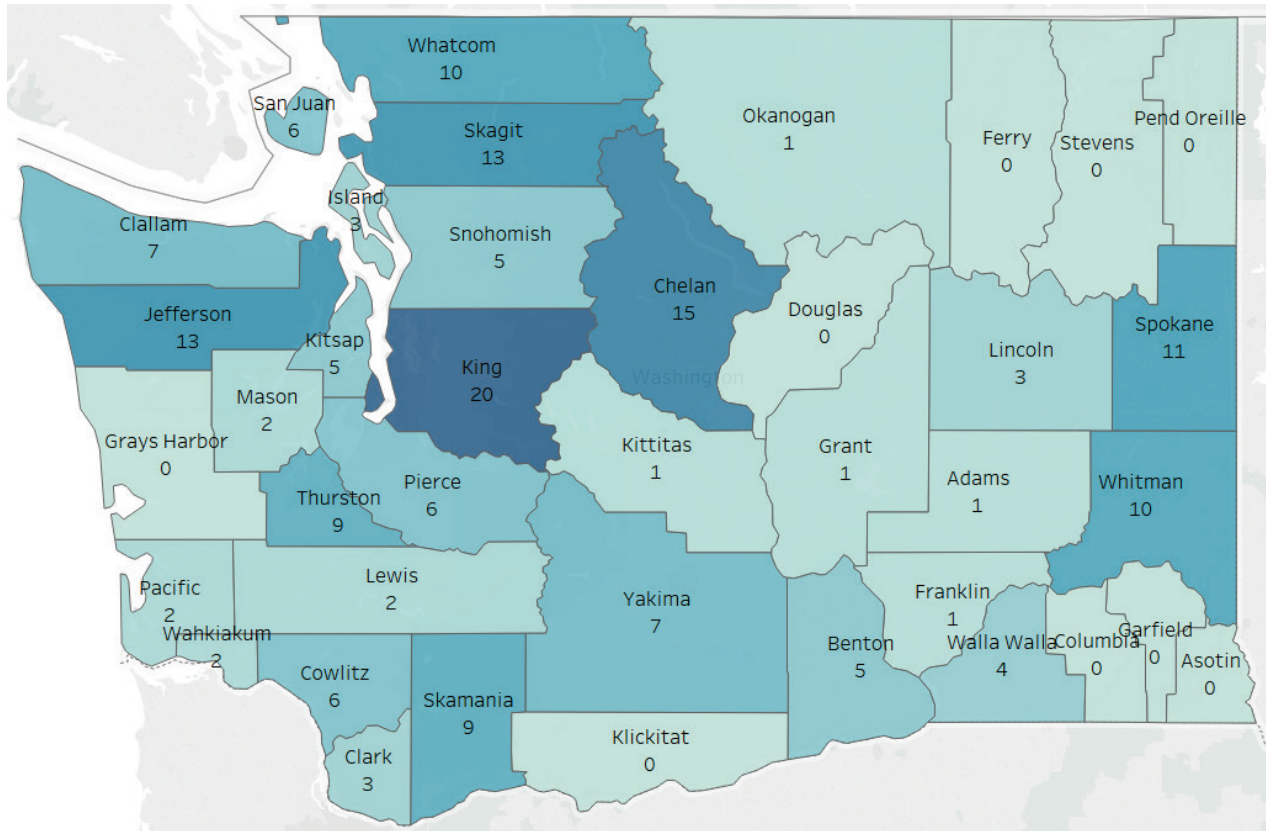
### County – Supply of Psychiatrists

The state had a psychiatrist rate of 10 physicians per 100,000 population. King County had the highest rate, 20 psychiatrists per 100,000 population, double the state rate. Only five counties, including King, had psychiatrist rates greater than the state average. The majority of the counties, 22, had fewer than five psychiatrists per 100,000 population.

Chart 29. Ranking of Psychiatrist Rates (per 100,000) by County, 2016



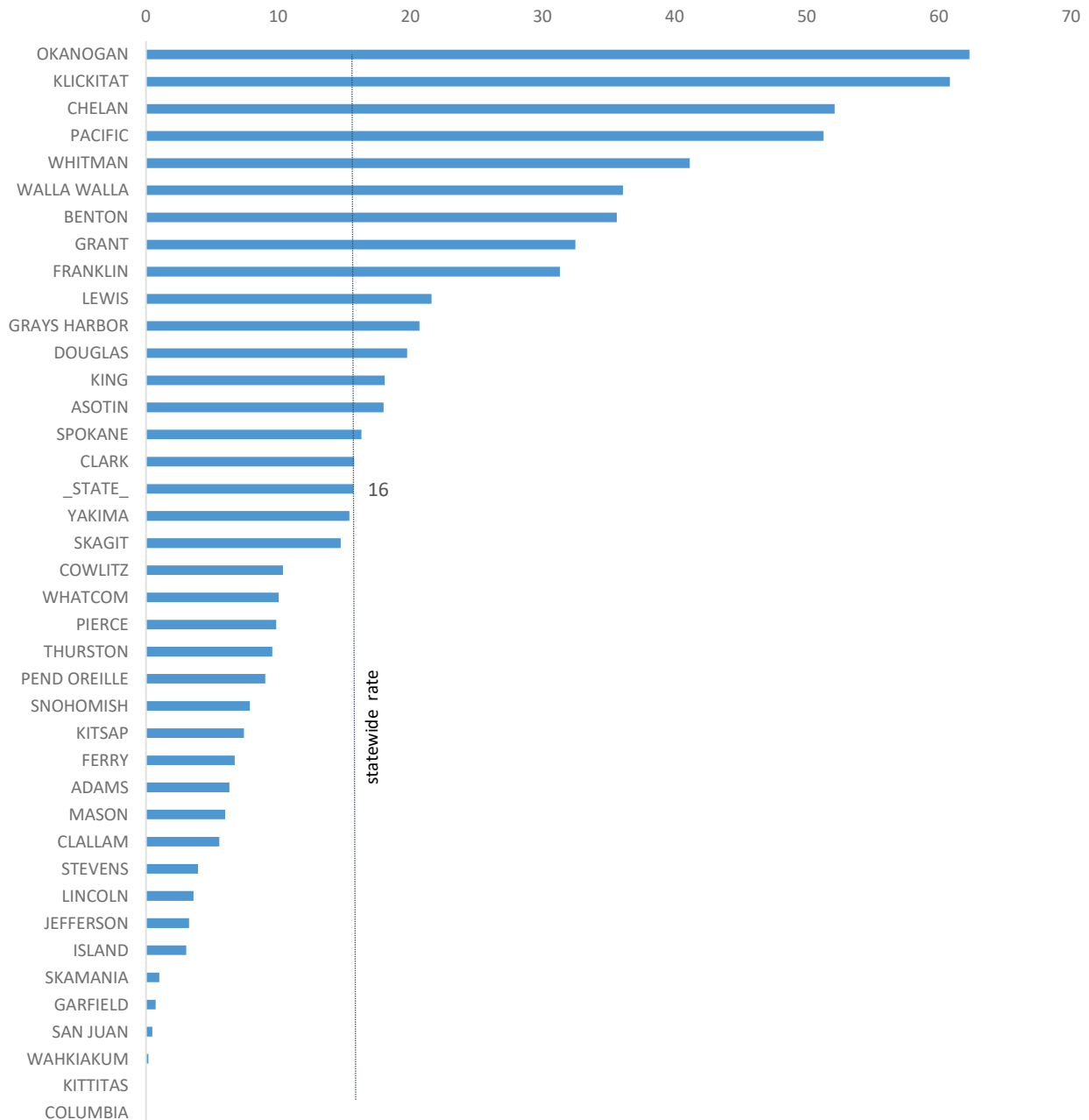
Map 16. Psychiatrists per 100,000 Population, Counties, 2016



### County – Supply of Radiologists

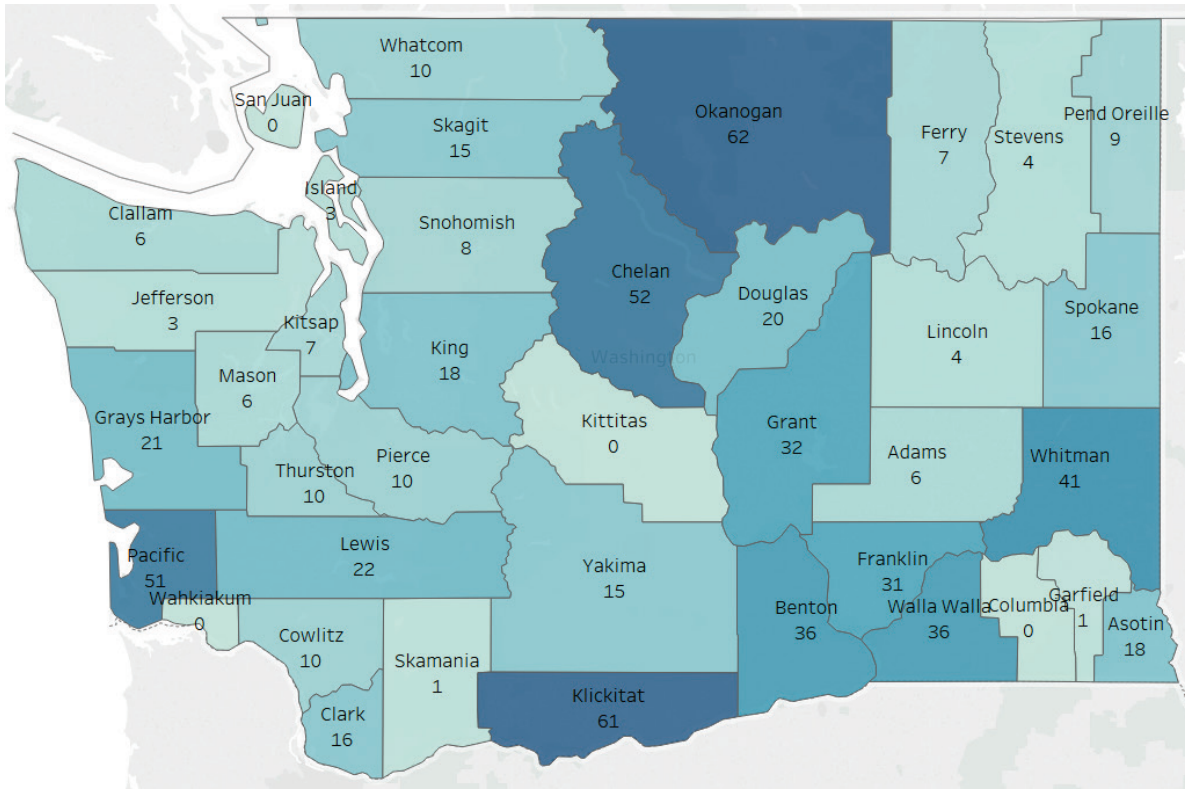
The rates of radiologists varied considerably among the counties. Eighteen counties had rates greater than the statewide rate of 16 radiologists per 100,000 population. Nine of these counties had rates that were double the statewide rate. The highest county rates, 62 in Okanogan and 61 in Klickitat, were almost four times larger than the state rate. On the opposite end, 10 counties had fewer than 5 radiologists per 100,000 population.

Chart 30. Ranking of Radiologist Rates (per 100,000) by County, 2016





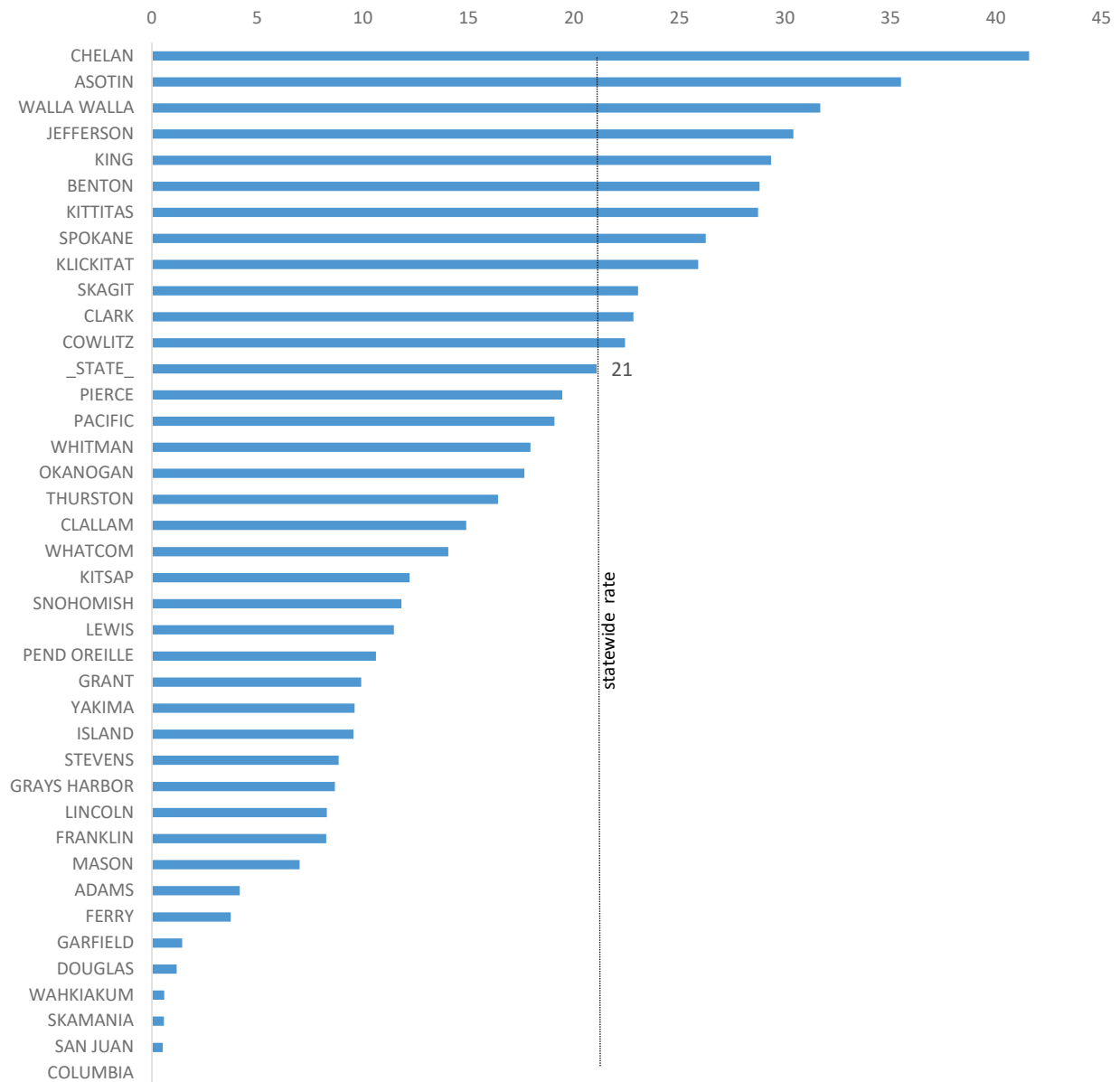
Map 17. Radiologists per 100,000 Population, Counties, 2016



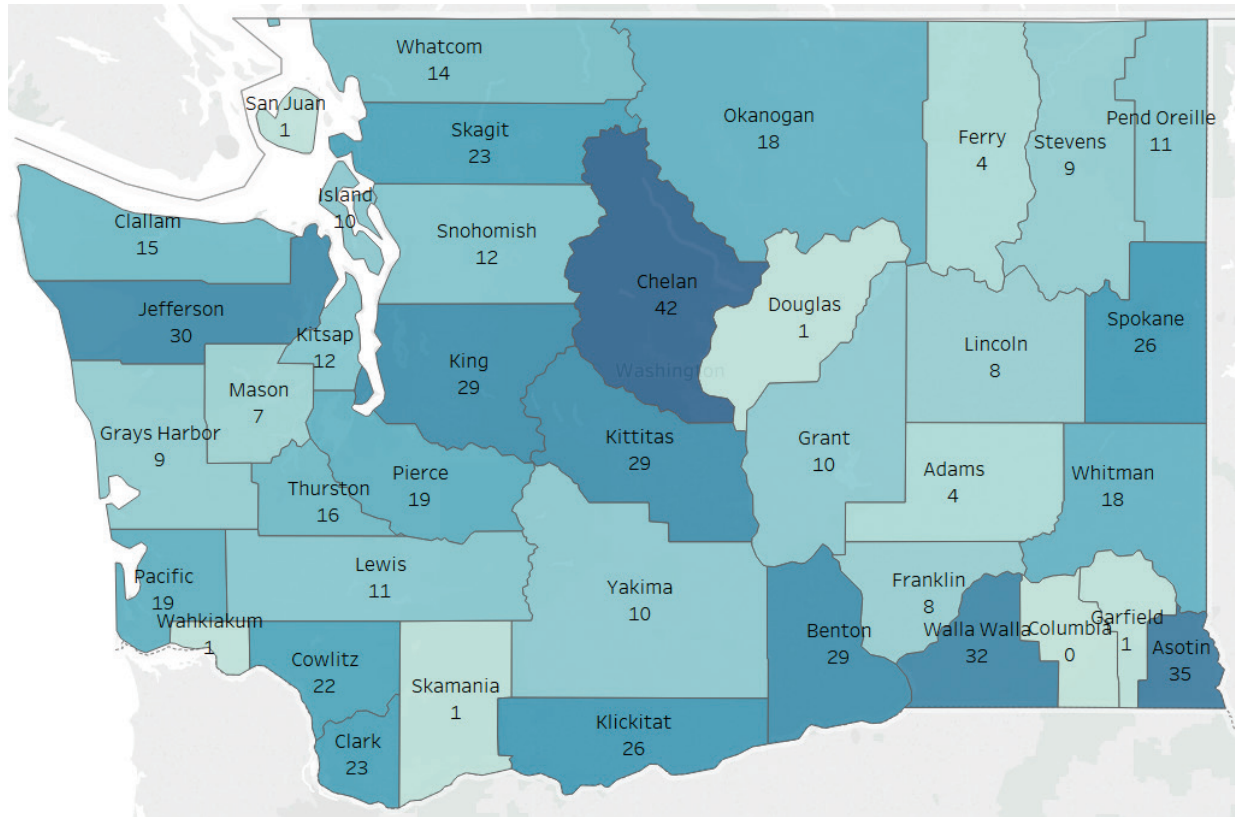
### County – Supply of Surgeons

Chelan County's rate of surgeons at 42 per 100,000, the highest of all counties, is twice as large as the state rate of 21. Close to one-third (12) of the counties had surgeon rates above the statewide rate. However, that means more than two-thirds of the counties had rates below the statewide rate. There were eight counties that each had fewer than five surgeons per 100,000 population.

Chart 31. Ranking of Surgeon Rates (per 100,000) by County, 2016



Map 18. Surgeons per 100,000 Population, Counties, 2016

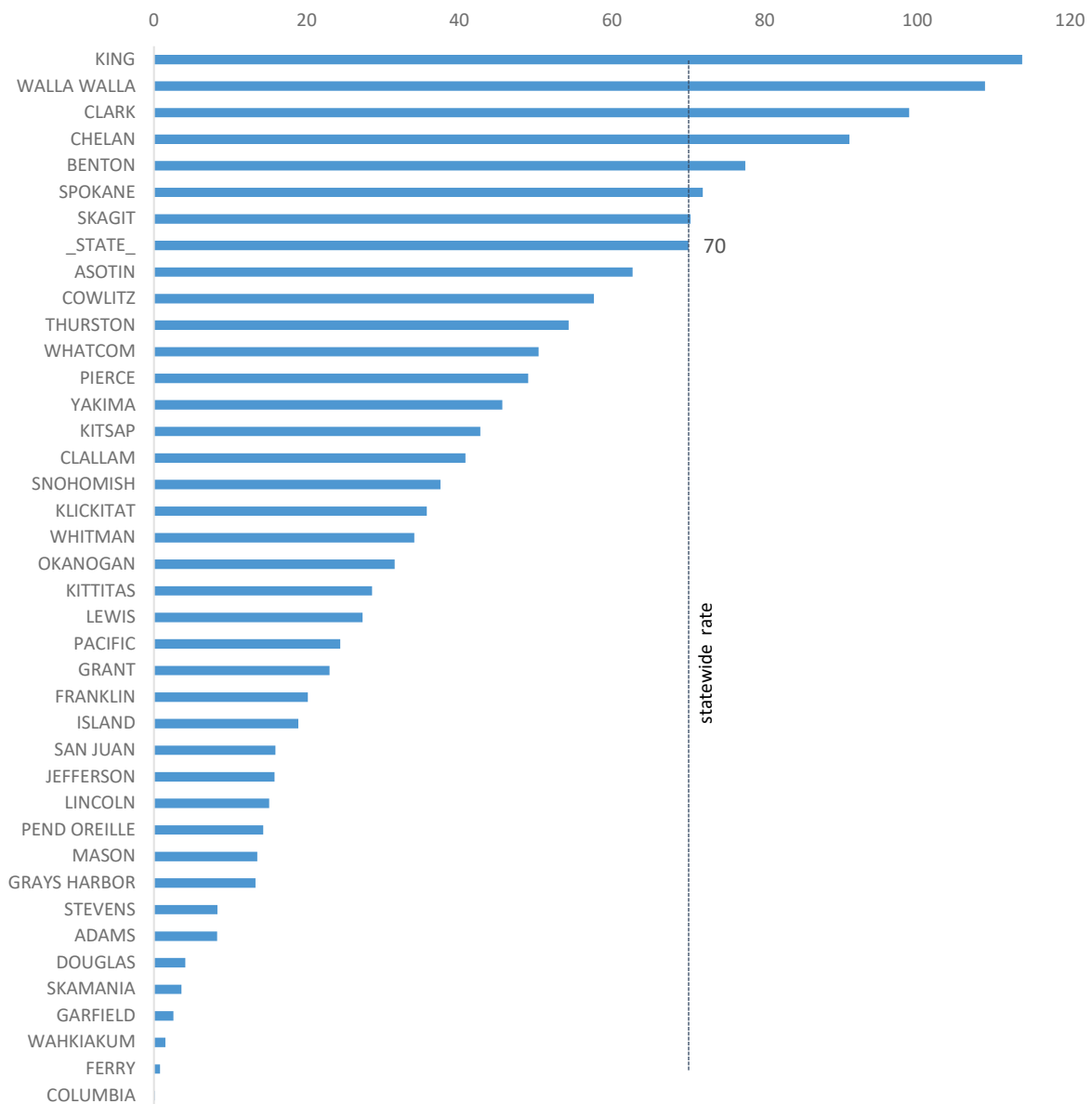


### County – Supply of Other Specialty Physicians

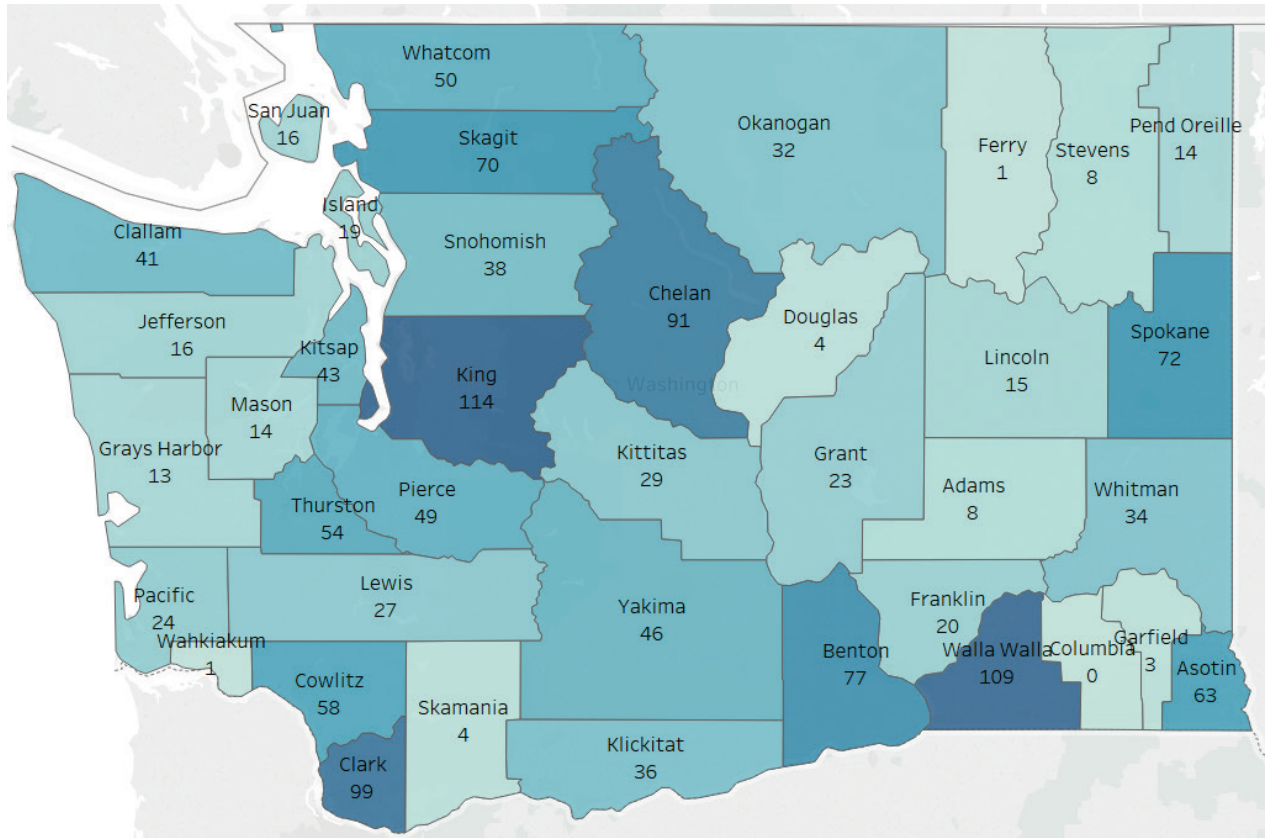
Other specialties include those not listed in previous charts for county rates, such as dermatology, otorhinolaryngology, oncology, pain medicine and urology. These specialties each had relatively small numbers of physicians.

King County led the counties with its rate of 114 other specialty physicians per 100,000 population while the statewide rate was 70. There were only seven counties, including King, that had other specialty physician rates at or greater than the statewide rate. On the opposite end, there were six counties with fewer than five such physicians per 100,000 population.

Chart 32. Ranking of Other Specialty Physician Rates (per 100,000) by County, 2016



Map 19. Other Specialty Physicians per 100,000 Population, Counties, 2016



## Section 3. ACH Physician Supply

### Key Findings

- *Overall supply of physicians.* The disparity of overall physician supply at the ACH level is not as large as at the county level. Still, the King County ACH's rate of 371 physicians per 100,000 population was more than twice as large as the lowest rate of 176 physicians (Olympic Community of Health).
- *Median age.* The difference in median age of physicians was small among the ACHs. In most ACHs, the physician median age was within one year of the statewide physician median age of 50. The difference between the oldest median age (53) in Greater Columbia ACH and the youngest (47) in Southwest Washington ACH was 6 years.
- *Percentage of female physicians.* The share of female physicians in the physician supply in most ACHs was smaller than the statewide share of 37 percent. King County ACH had the largest share of female physicians, 42 percent, and Greater Columbia ACH had the smallest share, 26 percent.
- *Percent of physicians licensed since 2000.* The shares of physicians licensed in Washington since 2000 were quite similar among the ACHs. The shares were all within about three percentage points from the statewide share of 60 percent, except for Southwest Washington ACH where more than 70 percent of the physicians obtained their first licenses since 2000.
- *Supply of PCPs.* King County ACH and Southwest Washington ACH each had rates of PCPs (122 and 119, respectively, per 100,000 population) that were greater than the PCP rates in other ACHs by 20-40 physicians. In addition to these two ACHs, Better Health Together also had a PCP rate that was above the state rate, though only slightly.
- *Supply of specialist physicians.* King County ACH was the only ACH with a specialist physician rate above the statewide rate. King County ACH's rate of 249 specialist physicians per 100,000 population was more than twice as large as the lowest rate of 101 specialist physicians per 100,000 population in Olympic Community of Health.
- *Physician supply by specialty.* In each specialty, King County ACH's rate was above the statewide rate, and in seven of the ten specialties, King County ACH had the highest rate. On the opposite end, three ACHs did not have any rate in the ten specialties that was above the respective statewide rate. All three are located on the west side of the state: Cascade Pacific Action Alliance, North Sound ACH and Olympic Community of Health. ACHs that had the highest rate in each of the 10 specialties are as follows (number in parentheses refers to number of physicians per 100,000 population):
 

Anesthesiology – King County ACH (23)	OB/GYN – King County ACH (16)
Cardiology – Better Health Together (10)	Pediatrics – King County ACH (17)
Emergency Medicine – Pierce County ACH (24)	Psychiatry – King County ACH (20)
Family Medicine – King County ACH (49)	Radiology – North Central ACH (41)
Internal Medicine – King County ACH (52)	Surgery – King County ACH (29)

Table 2 below provides a quick look at how each ACH compares to the state in its physician characteristics and supply. It is followed by detailed ACH physician data.

Table 2. At-A-Glance: ACH Physician Characteristics and Supplies in Comparison to Statewide Average, 2016

	Accountable Community of Health	State Average	Better Health Together	Cascade Pacific Action Alliance	Greater Columbia ACH	King County ACH	North Central ACH	North Sound ACH	Olympic Community of Health	Pierce County ACH	Southwest Washington ACH
Physician Characteristics	Median Age	50	+	+	+	-	+	=	+	-	-
	% Female	37	-	-	-	+	-	+	-	-	+
	% Licensed Since 2000	60	=	-	+	-	+	-	-	+	+
Physicians per 100,000 population	Overall	261	-	-	-	+	-	-	-	-	-
	PCP	96	+	-	-	+	-	-	-	-	+
	Specialist	165	-	-	-	+	-	-	-	-	-
	Anesthesiology	15	-	-	-	+	-	-	-	+	-
	Cardiology	7	+	-	+	+	-	-	-	-	-
	Emergency Medicine	19	+	-	=	+	-	-	-	+	-
	Family Medicine	41	+	-	-	+	+	-	-	-	-
	Internal Medicine	38	+	-	-	+	-	-	-	-	+
	OB/GYN	12	-	-	-	+	-	-	-	+	-
	Pediatrics	12	-	-	-	+	-	-	-	-	+
	Psychiatry	10	-	-	-	+	-	-	-	-	-
	Radiology	16	-	-	+	+	+	-	-	-	+
	Surgery	21	+	-	-	+	-	-	-	-	+
Other Specialties	70	-	-	-	+	-	-	-	-	+	

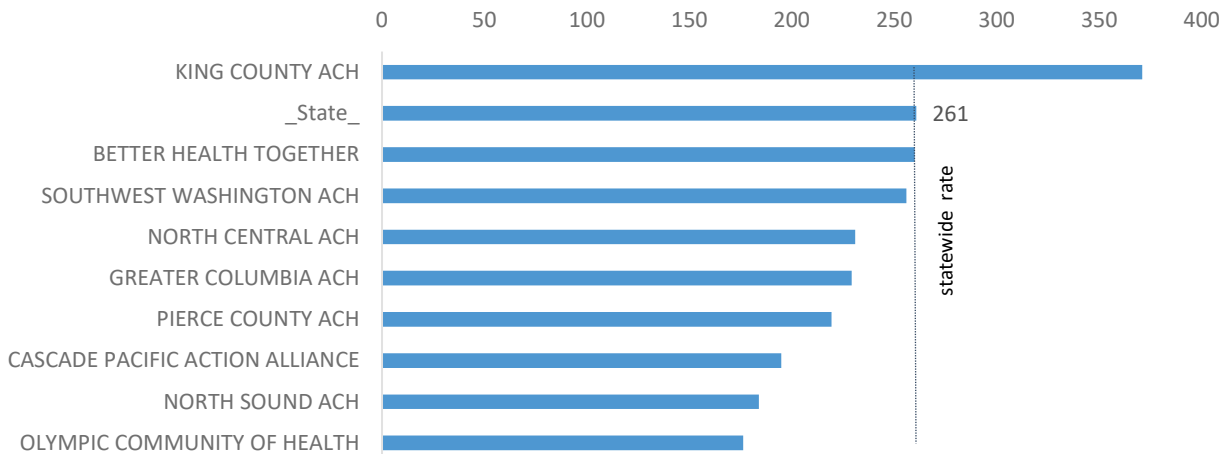
Symbols:

- +
  - 
  - =
- Above state average  
Below state average  
Same as state average

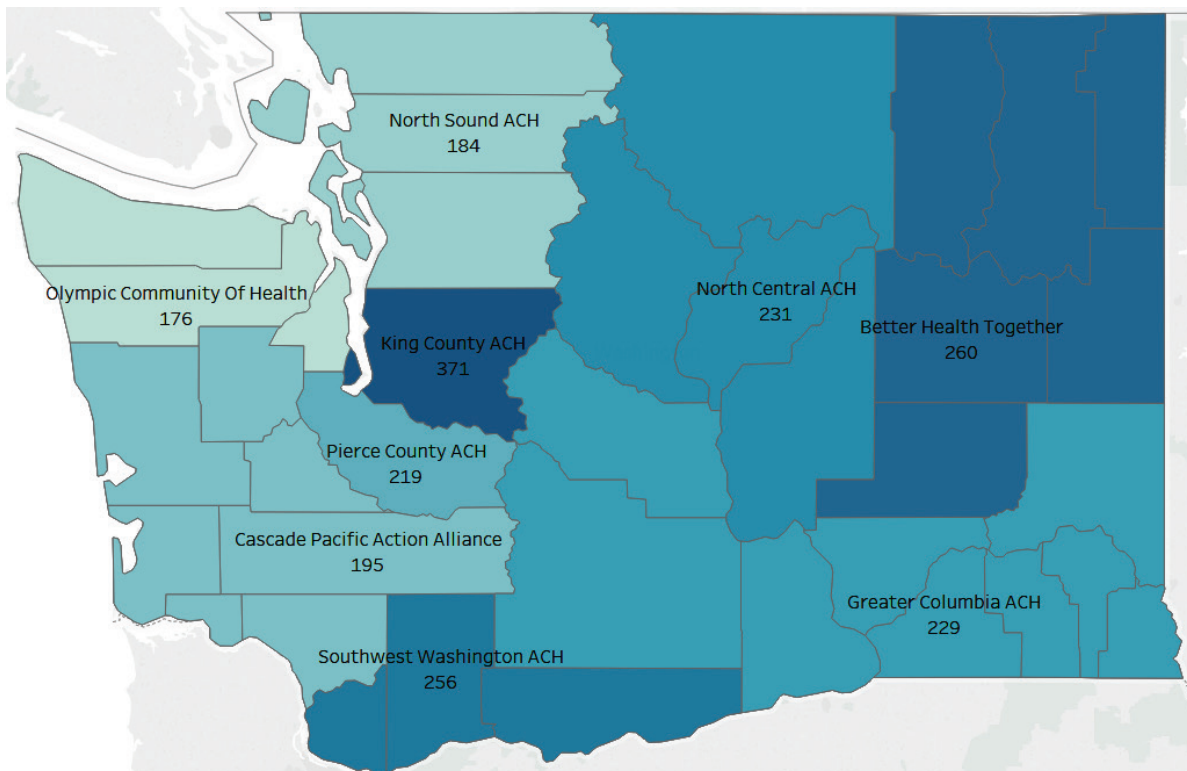
### ACH – Overall Supply of Physicians

King County ACH had the largest supply of physicians, 271 per 100,000 population, far more than the other eight ACHs. All other ACHs had physician-to-population rates that were lower than the statewide rate of 261. The Better Health Together ACH and the Southwest Washington ACH each had physician-to-population rates slightly lower than the statewide rate. The Olympic Community of Health had the lowest rate, 176 physicians per 100,000. Although the disparity in physician-to-population rates at the ACH level is not as large as the disparity at the county level, the highest ACH rate is still more than two times as large as the lowest rate.

Chart 33. Ranking of Overall Physician Rates (Per 100,000) by ACH, 2016



Map 20. Overall Physicians per 100,000 Population, ACHs, 2016

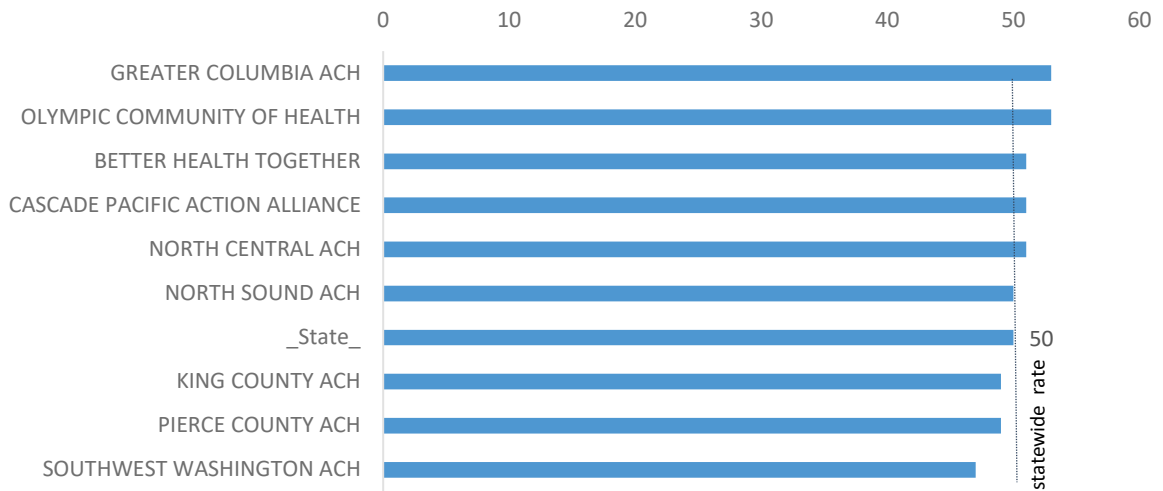




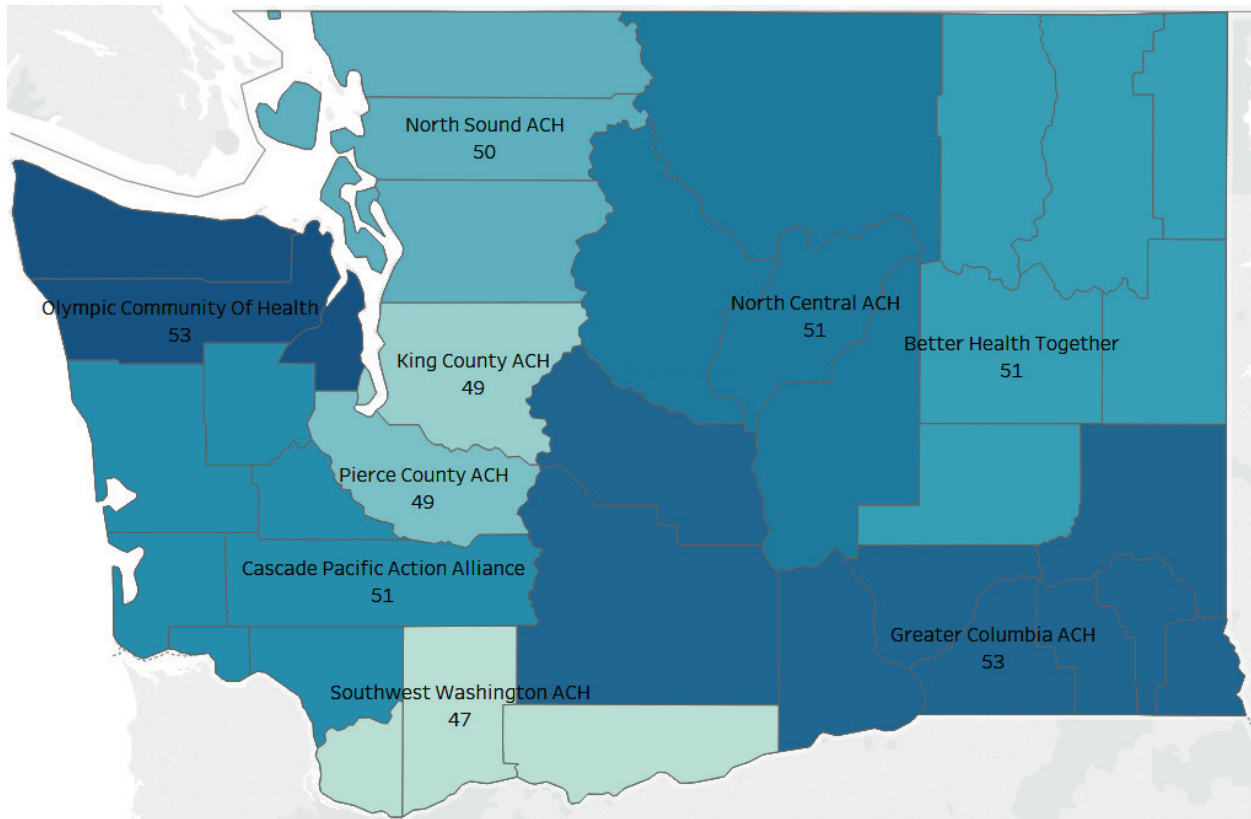
### ACH – Age of Physicians

The median age of physicians did not differ much among the ACHs. Physicians in the Greater Columbia ACH had the oldest median age, 53, which was three years older than the statewide median age. The youngest median age of 47 was three years below the statewide median in the Southwest Washington ACH.

Chart 34. Ranking of Physician Median Age by ACH, 2016



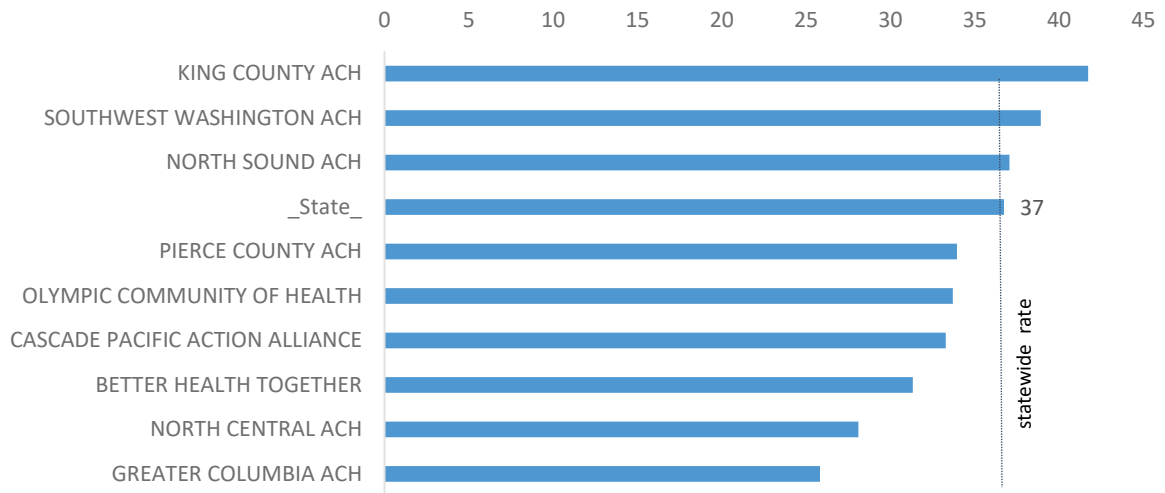
Map 21. Median Age of Physicians, ACHs, 2016



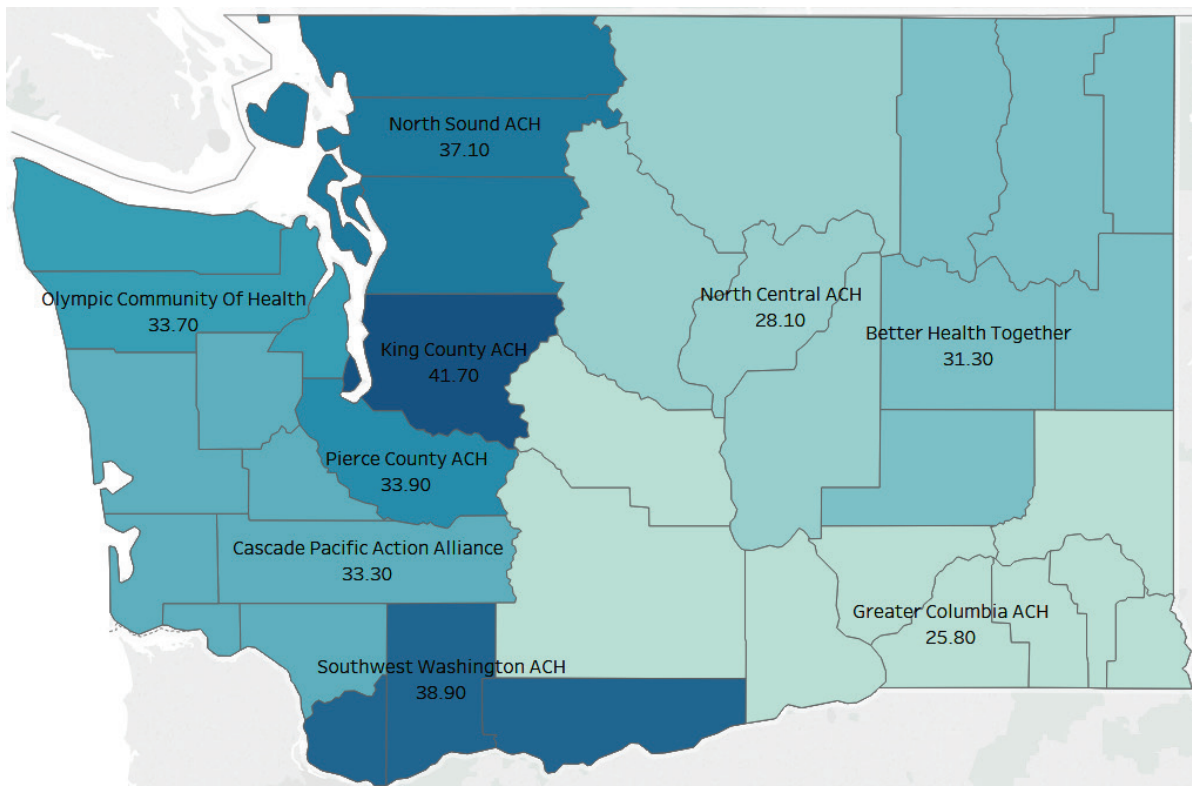
### ACH – Percentage of Female Physicians

Women constituted 37 percent of the state’s physician supply. Three of the nine ACHs had a somewhat larger percentage of women in their physician supply. The King County ACH had the largest percentage of female physicians at 42 percent, followed by the Southwest Washington ACH (39 percent) and the North Sound ACH (37 percent). The remaining six ACHs had shares of female physicians below the statewide rate, ranging from 26 percent to 34 percent.

Chart 35. Ranking of Percentage of Female Physicians by ACH, 2016



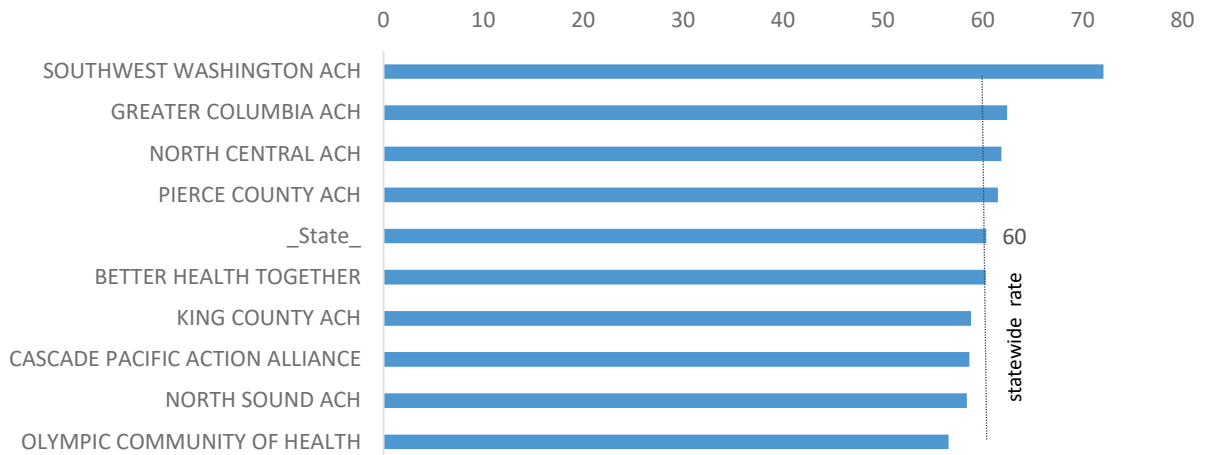
Map 22. Percentage of Female Physicians, ACHs, 2016



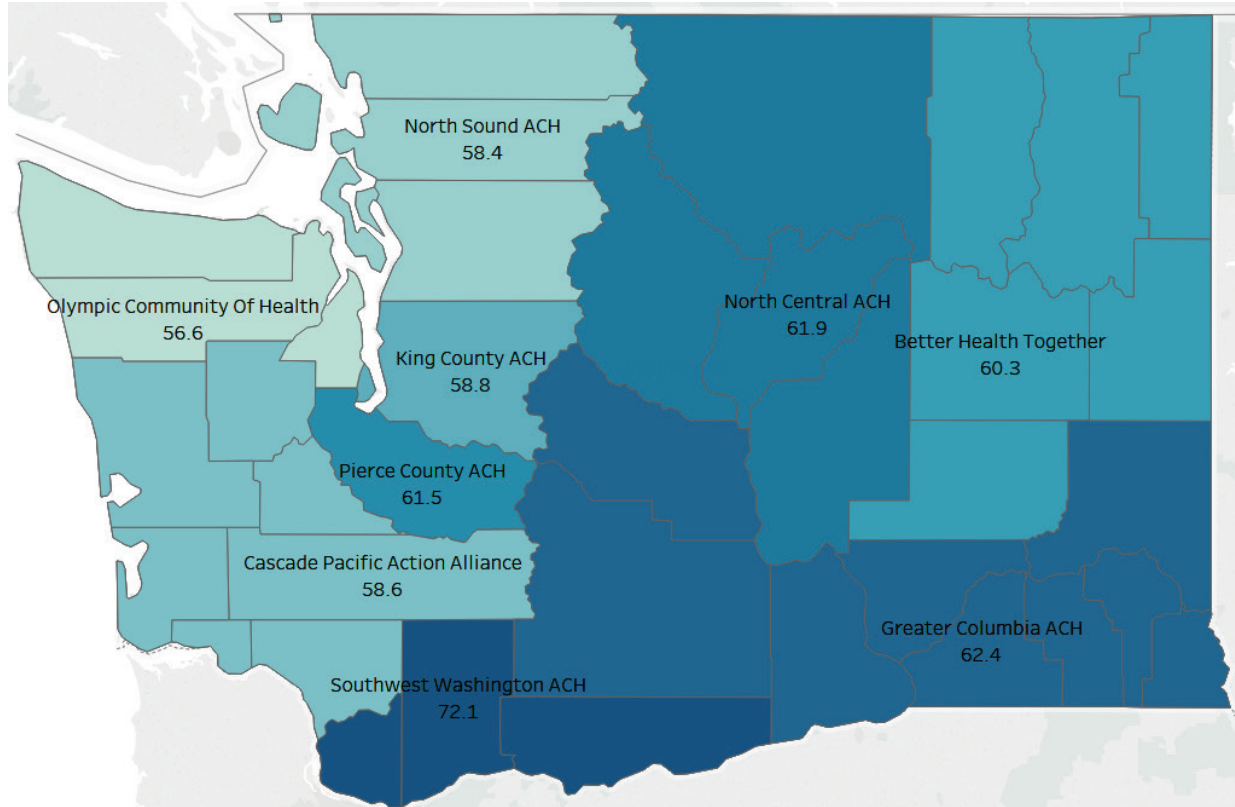
### ACH – Percentage of Physicians Licensed Since 2000

Statewide, 60 percent of the physicians obtained their Washington state licenses since 2000. At the ACH level, the rates are within about three percentage points of the statewide average, with one exception. In the Southwest Washington ACH, nearly three quarters (72 percent) of its physicians obtained their Washington state licenses since 2000.

Chart 36. Ranking of Percentages of Physicians Licensed Since 2000 by ACH, 2016



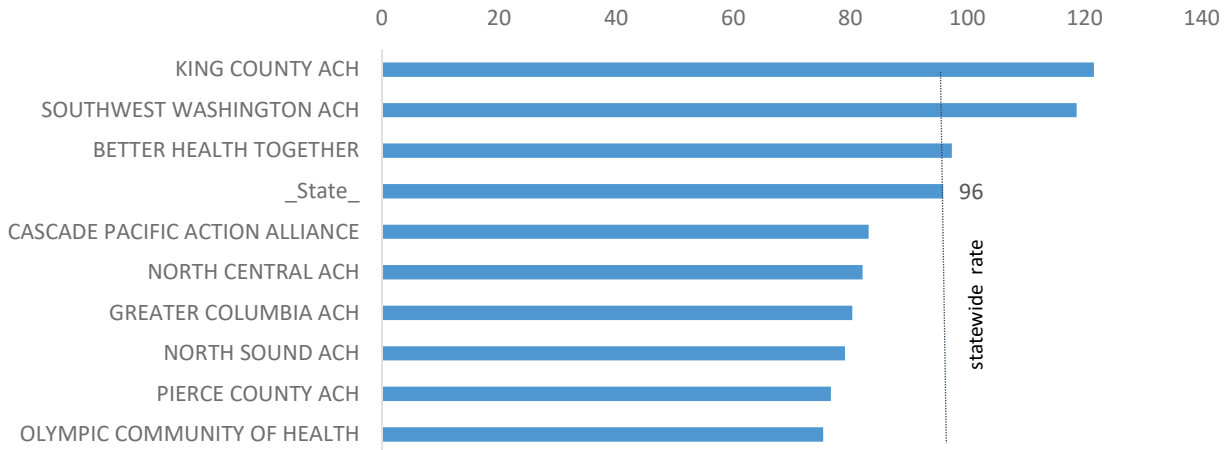
Map 23. Percentage of Physicians Licensed Since 2000, ACHs, 2016



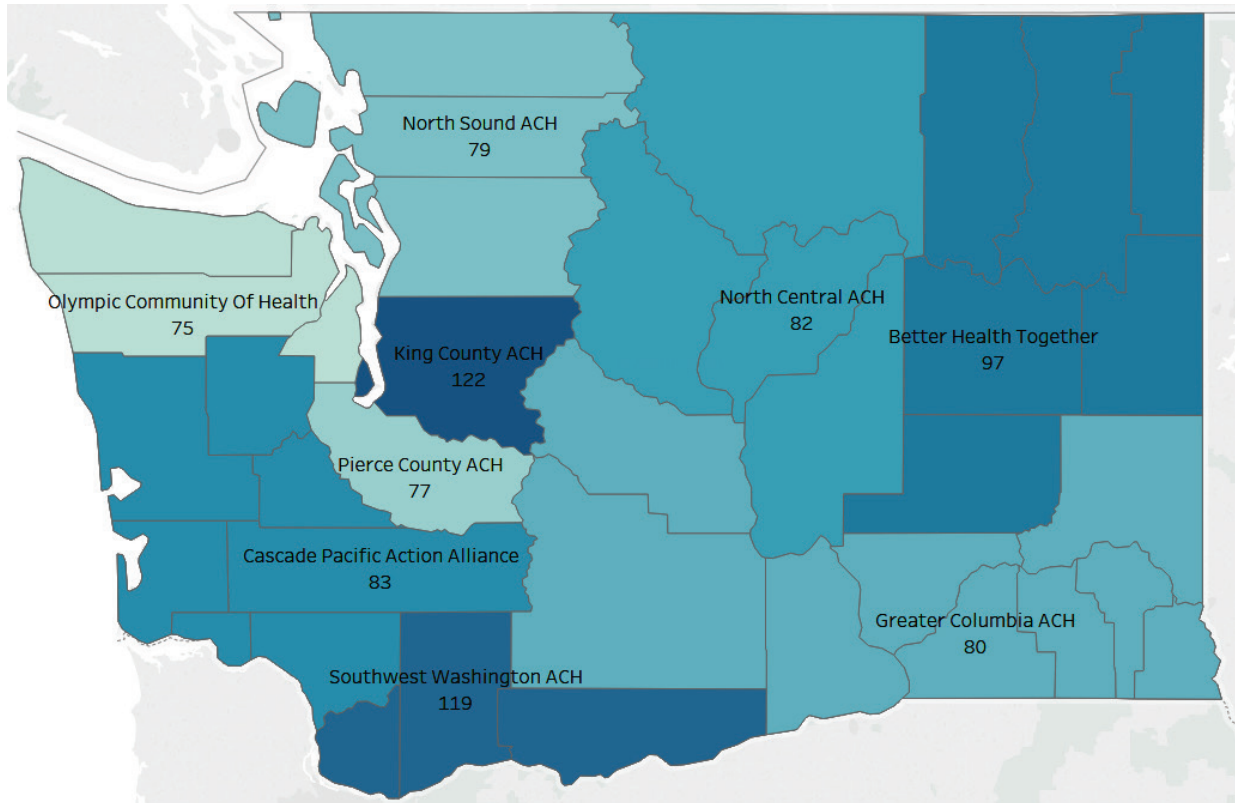
### ACH – Supply of PCPs

The King County ACH and the Southwest Washington ACH had the highest rates of PCPs, at 122 and 119 PCPs, respectively, per 100,000 population. The Southwest Washington ACH’s rate of 97 PCPs per 100,000 population was at par with the statewide rate of 96 PCPs per 100,000 population. The remaining six ACHs had rates below the state rate, ranging from 75 PCPs (Olympic Community of Health) to 83 PCPs (Cascade Pacific Action Alliance) per 100,000 population.

Chart 37. Ranking of PCP Rates (per 100,000) by ACH, 2016



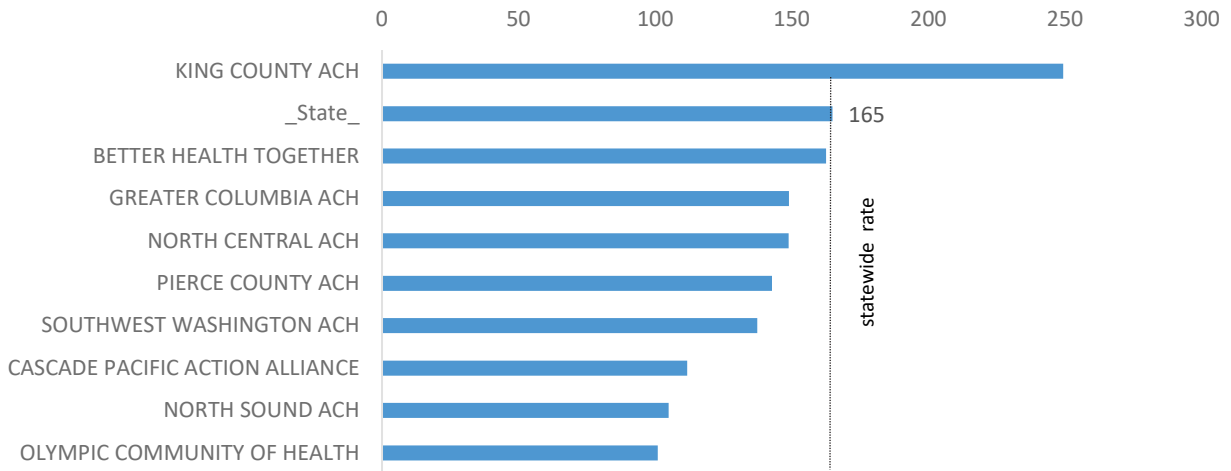
Map 24. PCPs per 100,000 Population, ACHs, 2016



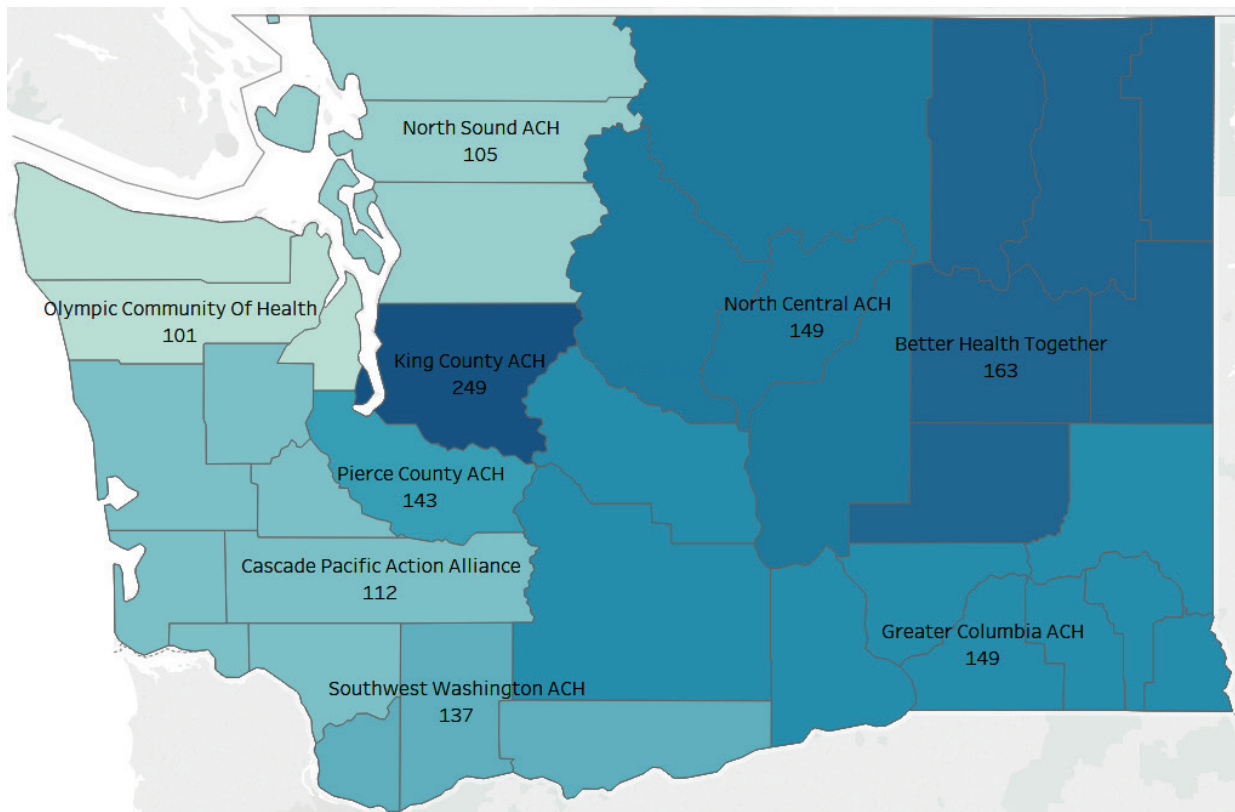
### ACH – Supply of Specialists

The specialist physician rate of 249 physicians per 100,000 population placed the King County ACH in a category of its own. It is the only ACH with a specialist physician rate above the statewide rate of 165 physicians per 100,000 population. The specialist rates of the remaining counties ranged from 101 to 163 physicians per 100,000. The King County ACH’s rate is two and half times as large as the lowest rate (Olympic Community of Health).

Chart 38. Ranking of Specialist Rates (per 100,000) by ACH, 2016



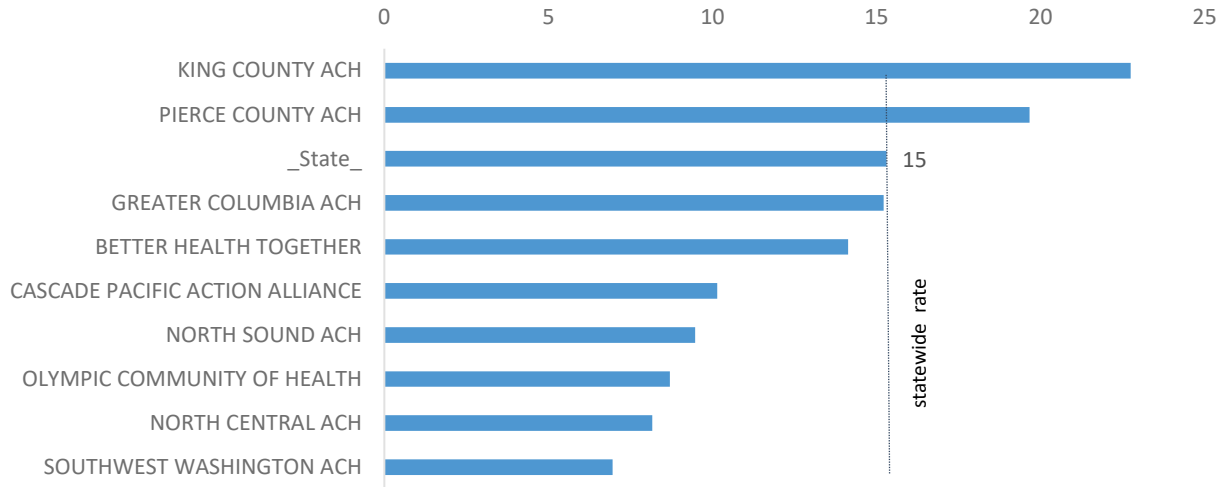
Map 25. Specialists per 100,000 Population, ACHs, 2016



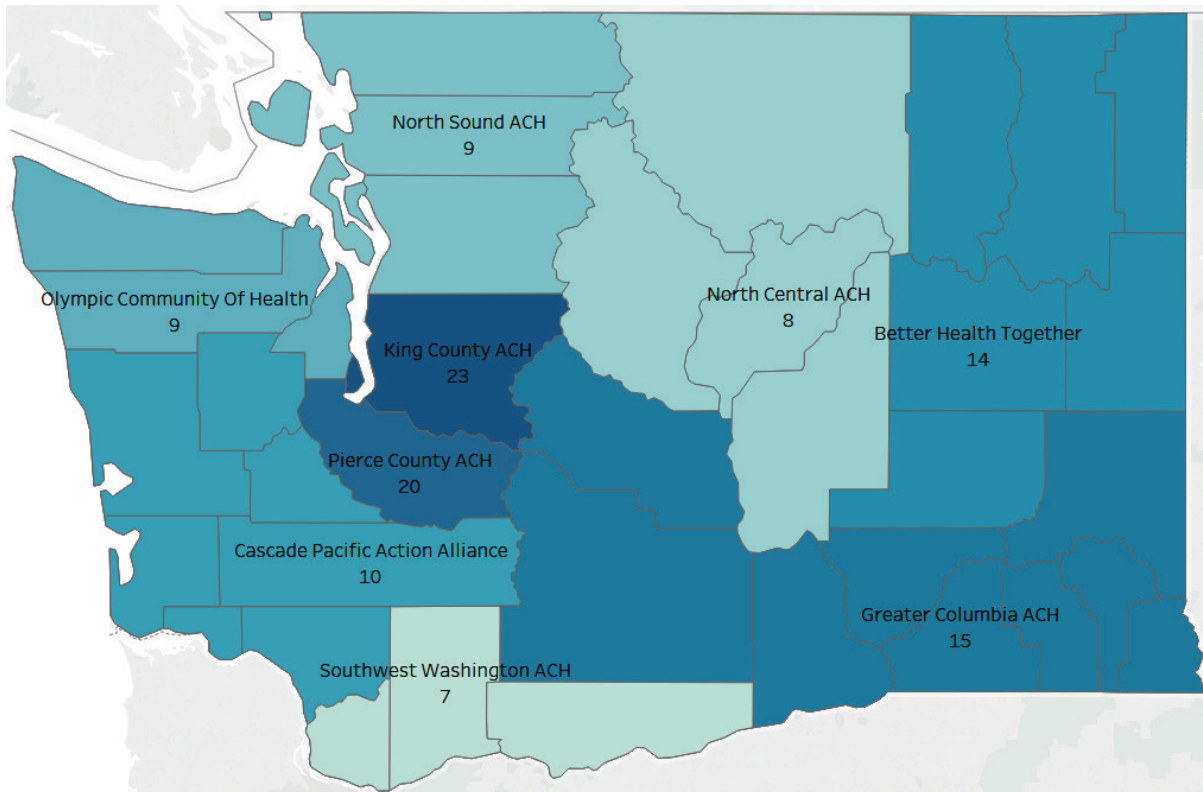
### ACH – Supply of Anesthesiologists

Two ACHs had rates of anesthesiologists above the statewide rate of 15 physicians per 100,000 population. King County had the highest rate of 23, and Pierce County ACH had 20 anesthesiologists per 100,000 population. The Greater Columbia ACH’s rate tied with the statewide rate. The other six ACHs had lower rates with the lowest rate of seven anesthesiologists per 100,000 population in the Southwest Washington ACH.

Chart 39. Ranking of Anesthesiologist Rates (per 100,000) by ACH, 2016



Map 26. Anesthesiologists per 100,000 Population, ACHs, 2016

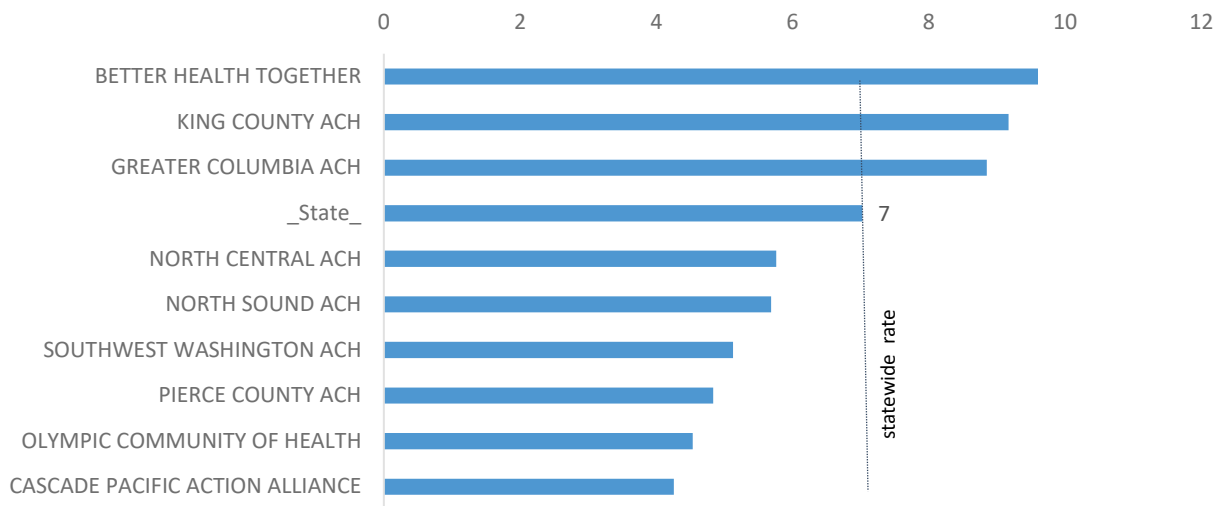




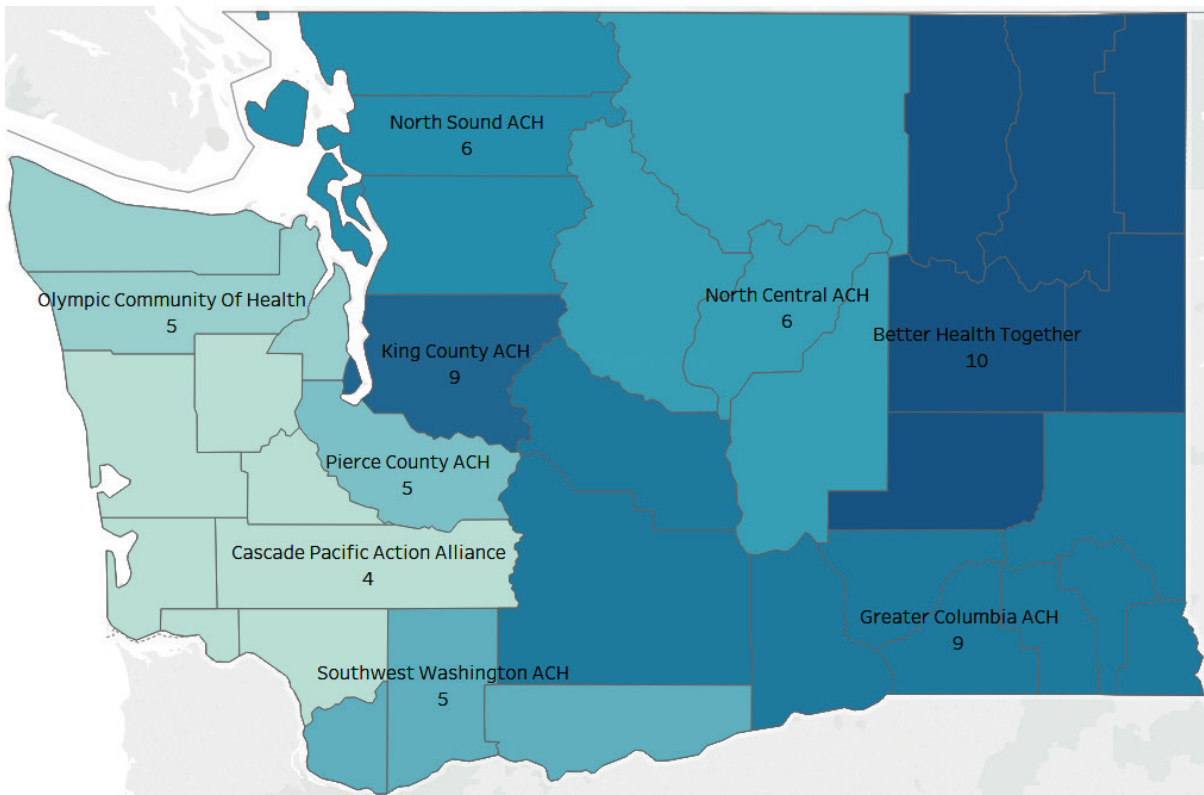
### ACH – Supply of Cardiologists

Statewide, the rate of cardiologists was seven physicians per 100,000 population. The rates at the ACH level did not vary a great deal from the statewide rate. The highest ACH rate (in Better Health Together) is only three physicians more and the lowest ACH rate (in Cascade Pacific Action Alliance) is only three physicians fewer than the statewide rate. However, the highest rate is still more than twice as large as the lowest rate.

Chart 40. Ranking of Cardiologist Rates by ACH, 2016



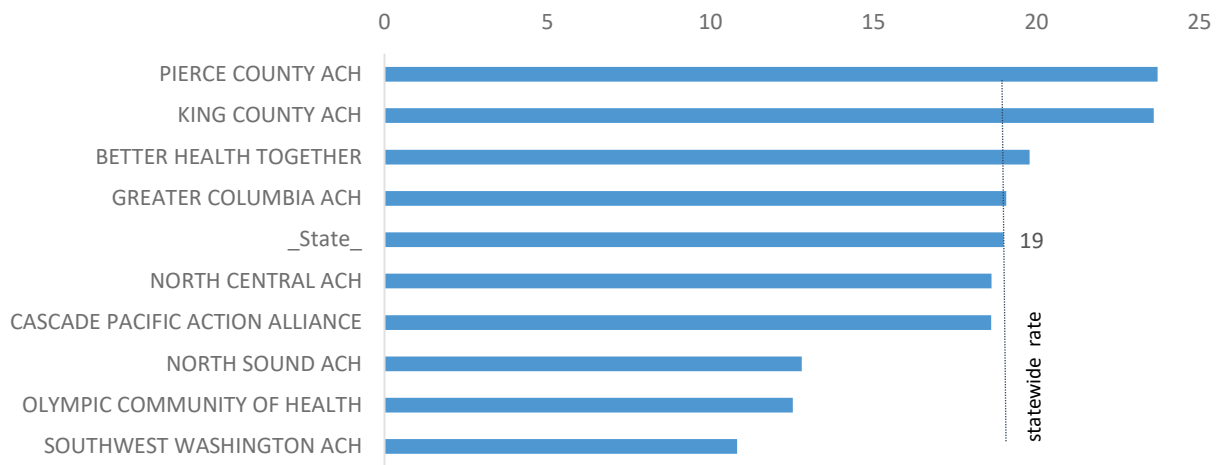
Map 27. Cardiologists per 100,000 Population, ACHs, 2016



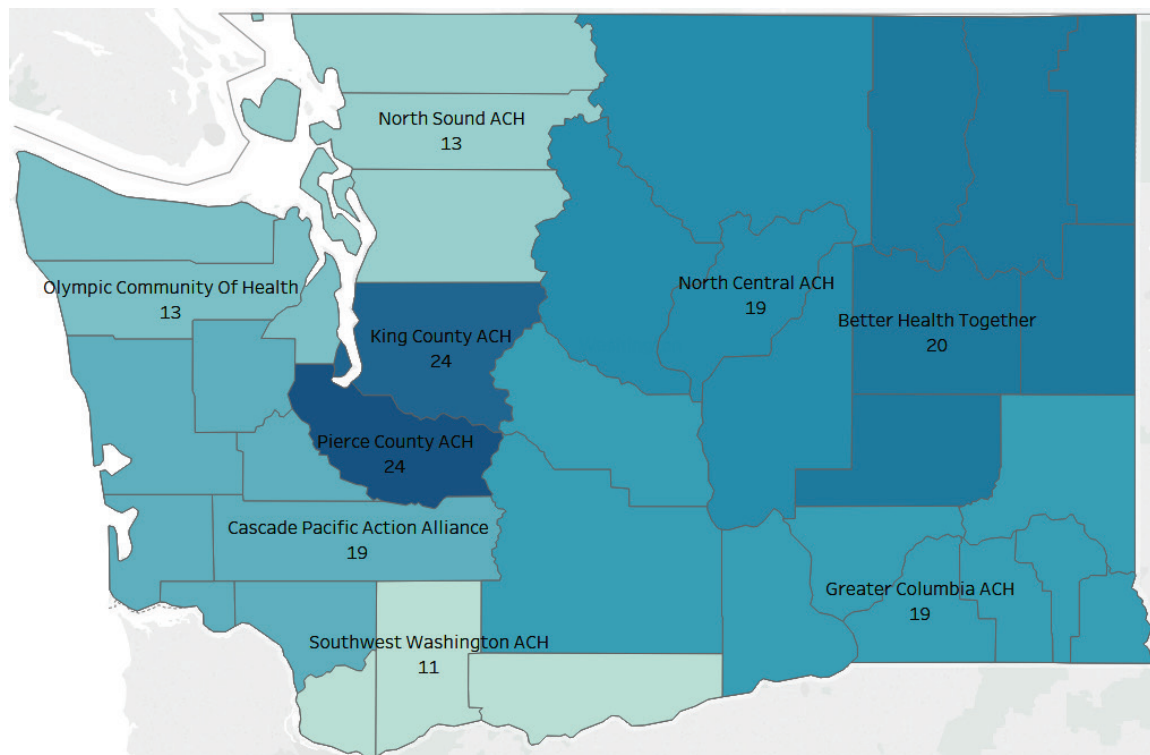
### ACH – Supply of Emergency Medicine Physicians

The Pierce County ACH and the King County ACH led the ACHs with 24 emergency medicine physicians each per 100,000 population. This rate is five physicians more than the statewide rate of 19 emergency medicine physicians per 100,000 population. The three eastern Washington's ACHs (Better Health Together, Greater Columbia ACH and North Central ACH) and one western Washington ACH (Cascade Pacific Action Alliance) had emergency medicine physician rates similar to the statewide rate. The remaining three ACHs, all located in western Washington, had emergency medicine physician rates below the statewide rate.

Chart 41. Ranking of Emergency Medicine Physician Rates (per 100,000) by ACH, 2016



Map 28. Emergency Medicine Physicians per 100,000 Population, ACHs, 2016

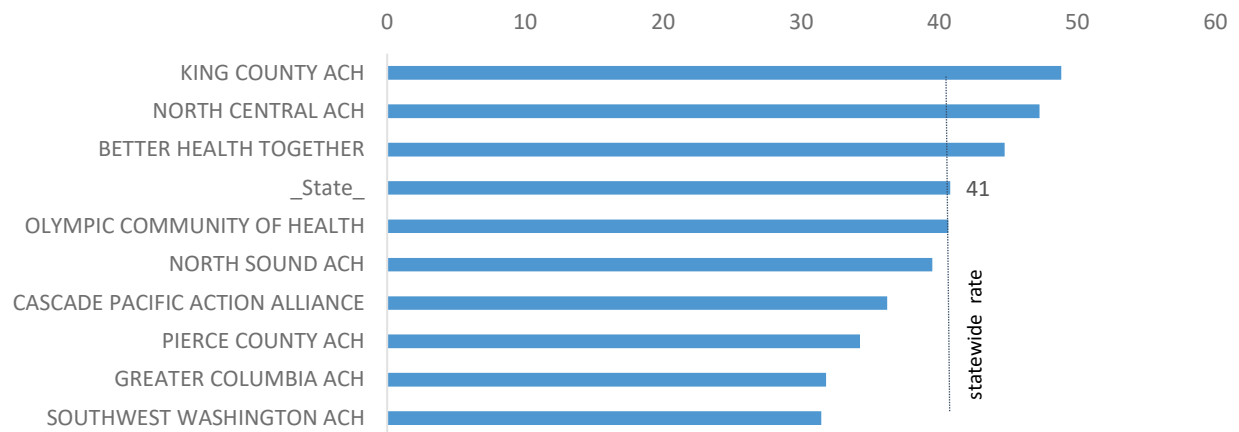




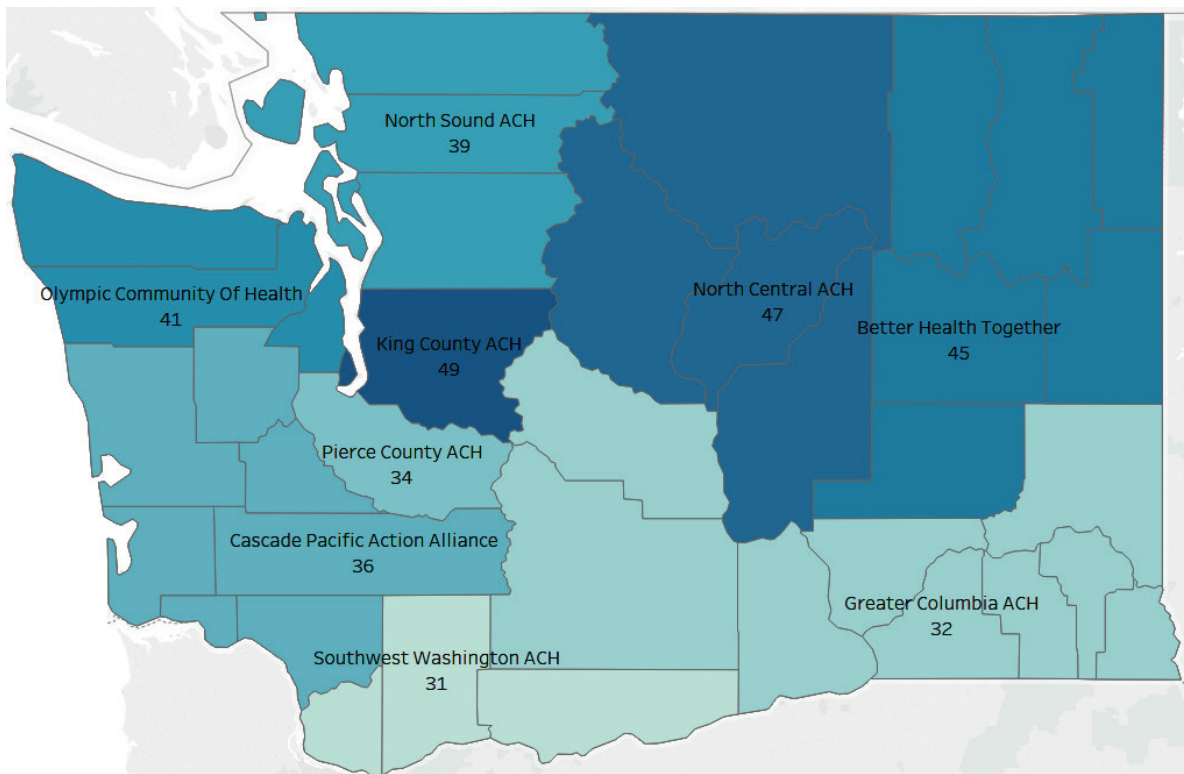
### ACH – Supply of Family Medicine Physicians

The King County ACH and two eastern Washington ACHs, North Central ACH and Better Health Together, fared better than the state as a whole with the highest rates of family medicine physicians at 49, 47 and 45 physicians per 100,000 population, respectively. The statewide rate was 41. The rates of family medicine physicians in the remaining six ACHs ranged from 31 to 41 physicians per 100,000 population. The gap between lowest rate (Southwest Washington ACH) and the highest rate (King County ACH) is small compared with such gaps observed in physician rates of some other specialties. The highest family medicine physician rate is 1.6 times as large as the lowest rate.

Chart 42. Ranking of Family Medicine Physician Rates (per 100,000) by ACH, 2016



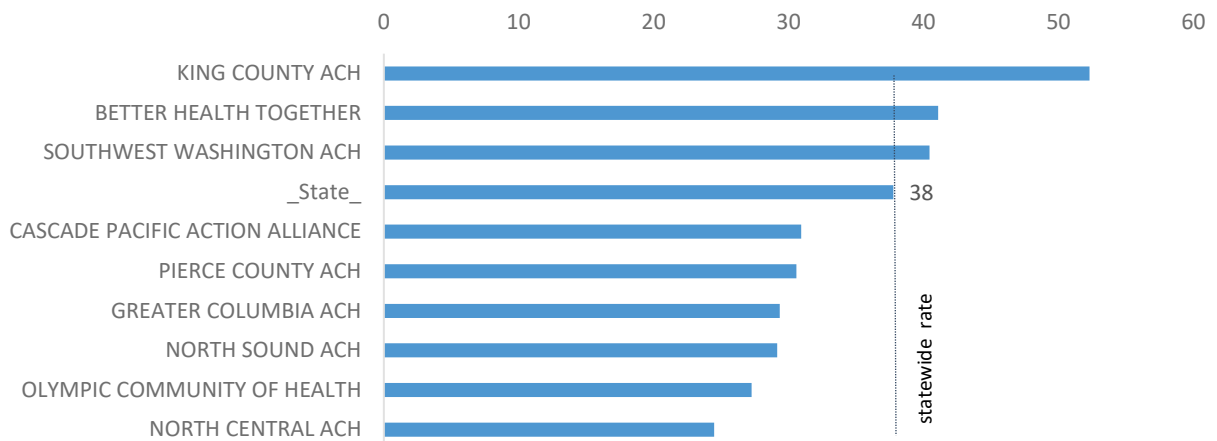
Map 29. Family Medicine Physicians per 100,000 Population, ACHs, 2016



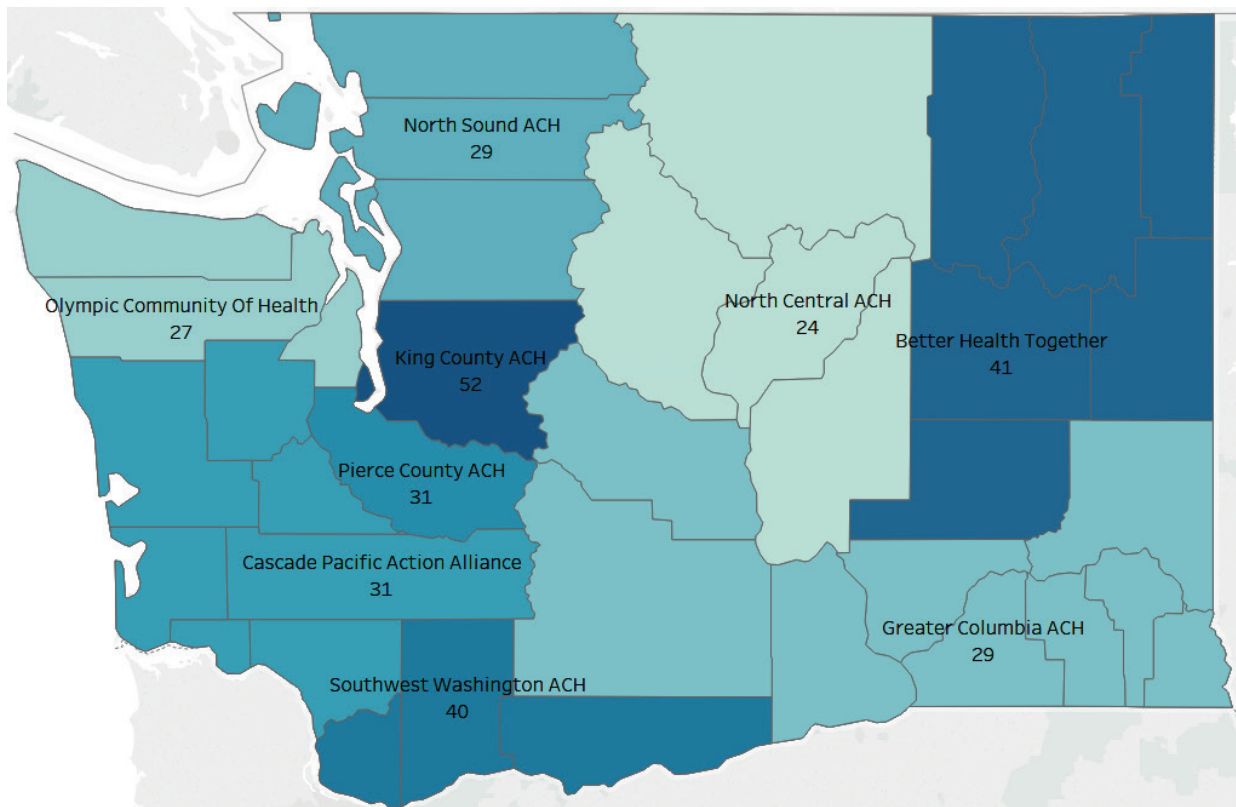
### ACH – Supply of Internal Medicine Physicians

The King County ACH with a rate of 52 per 100,000 population had a greater supply of internal medicine physicians than the other ACHs. Two other ACHs, Better Health Together and Southwest Washington ACH, also joined the King County ACH with their internal medicine physician rates above the statewide rate of 38 physicians per 100,000 population. The rates of the remaining six ACHs were below the statewide rate with the lowest rate in the North Central ACH, 24 physicians per 100,000. The King ACH's highest rate is more than two times as large as the lowest rate.

Chart 43. Ranking of Internal Medicine Physician Rates (per 100,000) by ACH, 2016



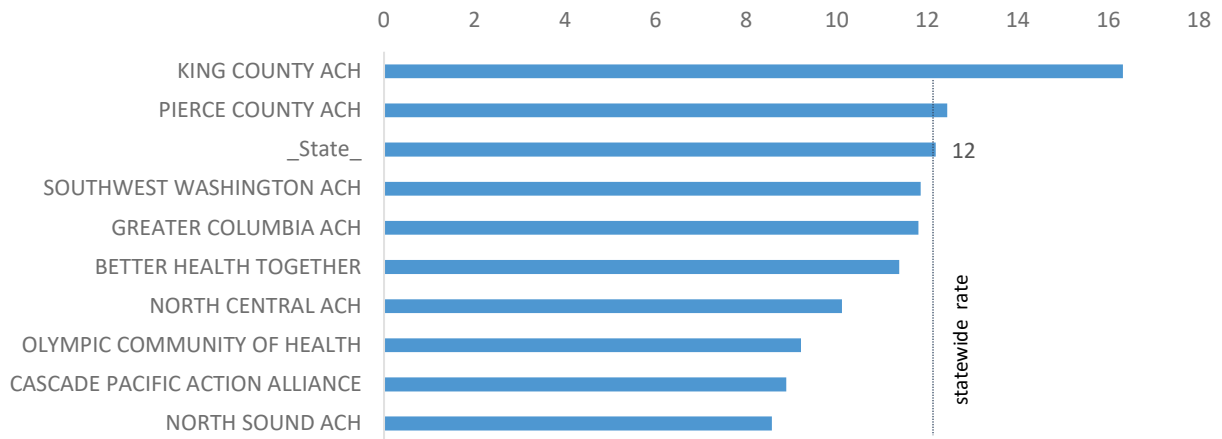
Map 30. Internal Medicine Physicians per 100,000 Population, ACHs, 2016



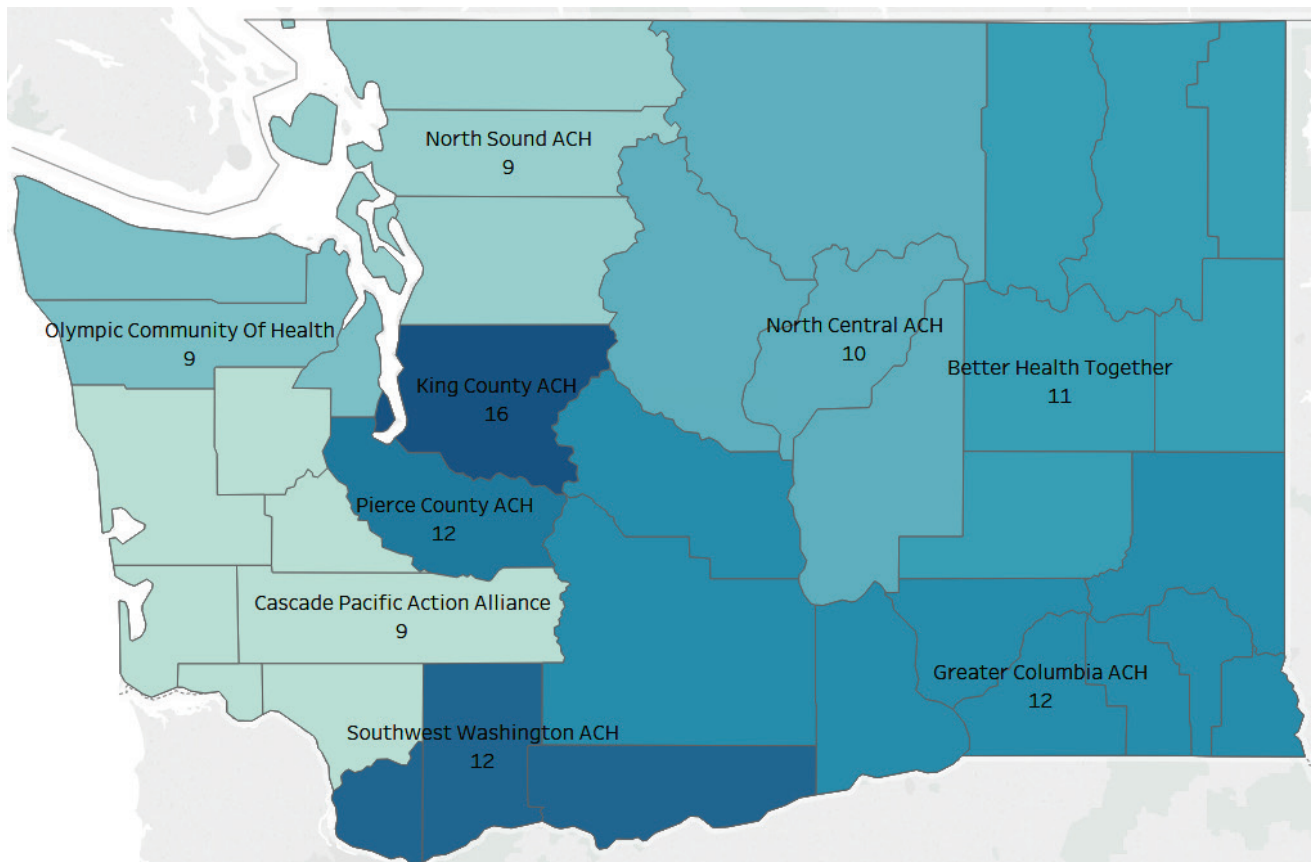
### ACH – Supply of OB/GYNs

Statewide rate of OB/GYNs was 12 physicians per 100,000 population. Only King County ACH and Pierce County ACH had rates above the state rate. The King County ACH’s rate was 16 physicians per 100,000 and Pierce County ACH’s rate was slightly above the state rate at 12. For the other seven ACHs, the rates ranged from 9 to 11 OB/GYNs per 100,000 population. The North Sound ACH had the lowest rate.

Chart 44. Ranking of OB/GYN Rates (100,000) by ACH, 2016



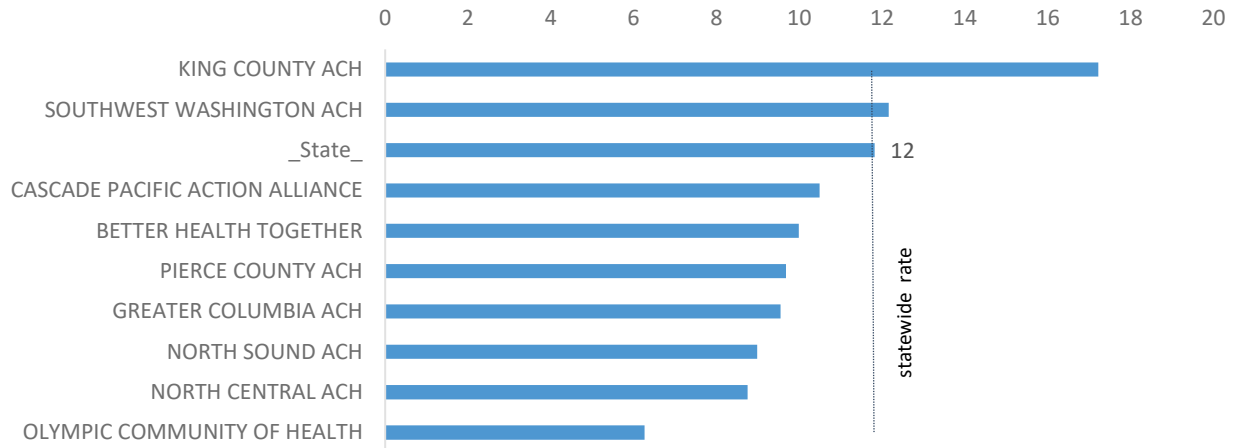
Map 31. OB/GYNs per 100,000 Population, ACHs, 2016



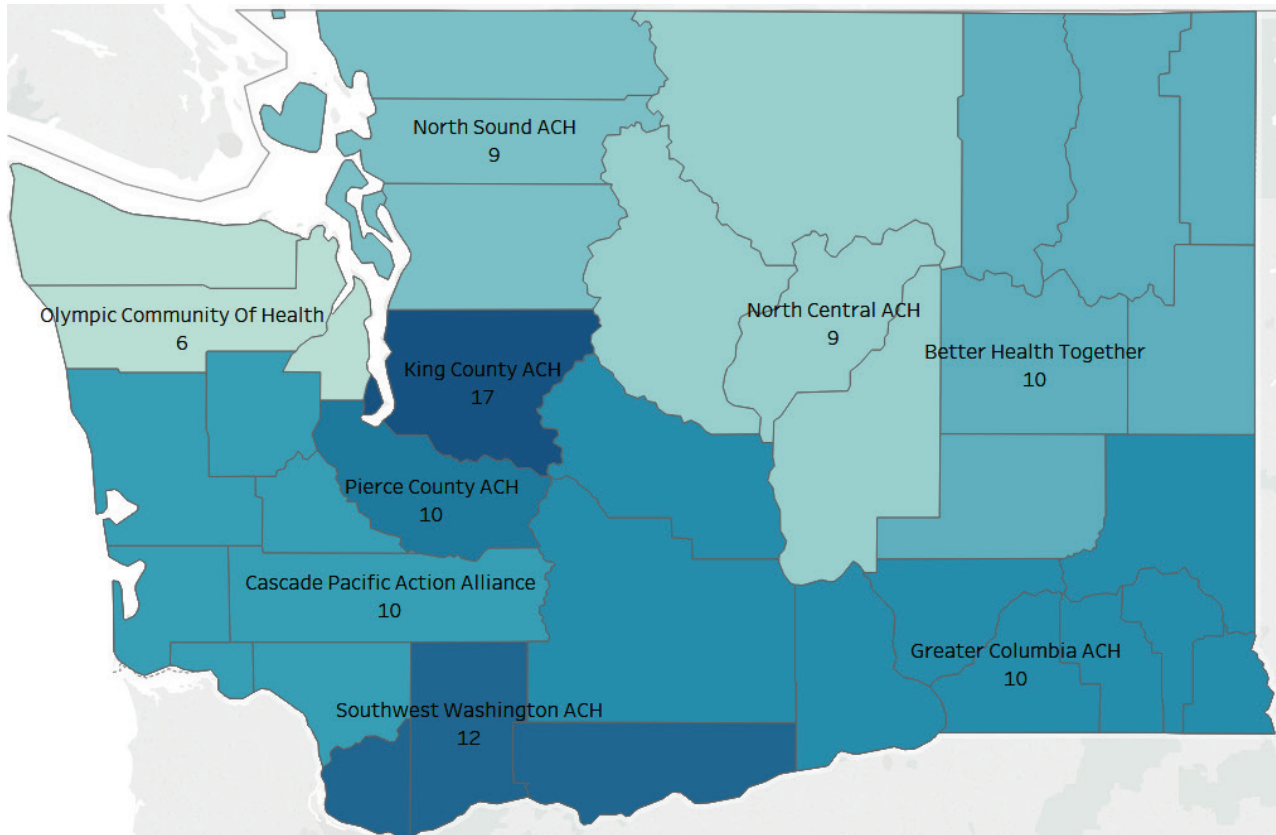
### ACH – Supply of Pediatricians

Across all ACHs, the rates of pediatricians ranged from 6 to 17 physicians per 100,000 population. The highest rate (King County ACH) is almost three times as large as the lowest rate (Olympic Community of Health). Statewide, the rate was 12 pediatricians per 100,000 population. In addition to the King County ACH, there was only one other ACH with a rate above the state rate. This was the Southwest Washington ACH, with a rate slightly above 12.

Chart 45. Ranking of Pediatrician Rates (per 100,000) by ACH, 2016



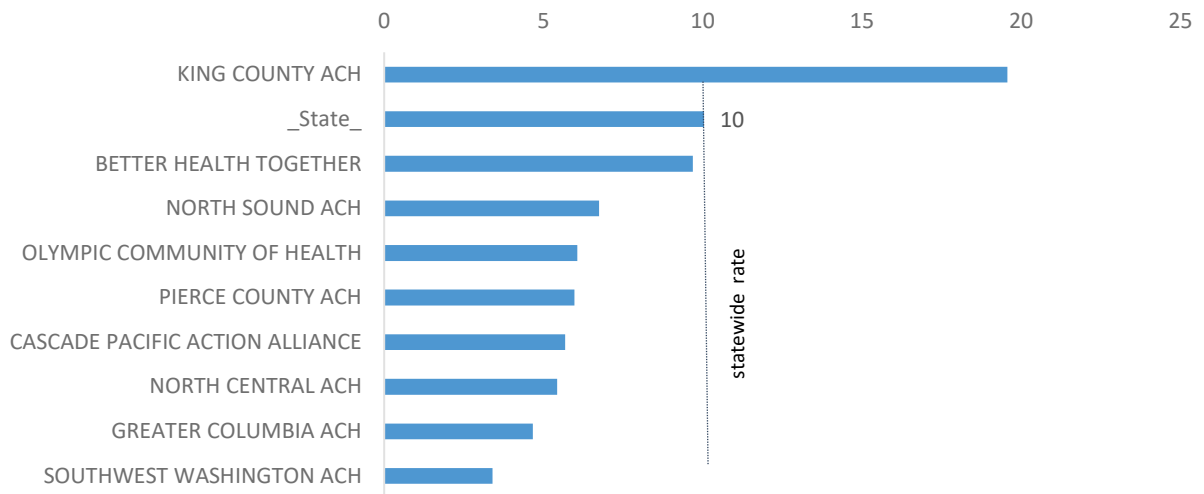
Map 32. Pediatricians per 100,000 Population, ACHs, 2016



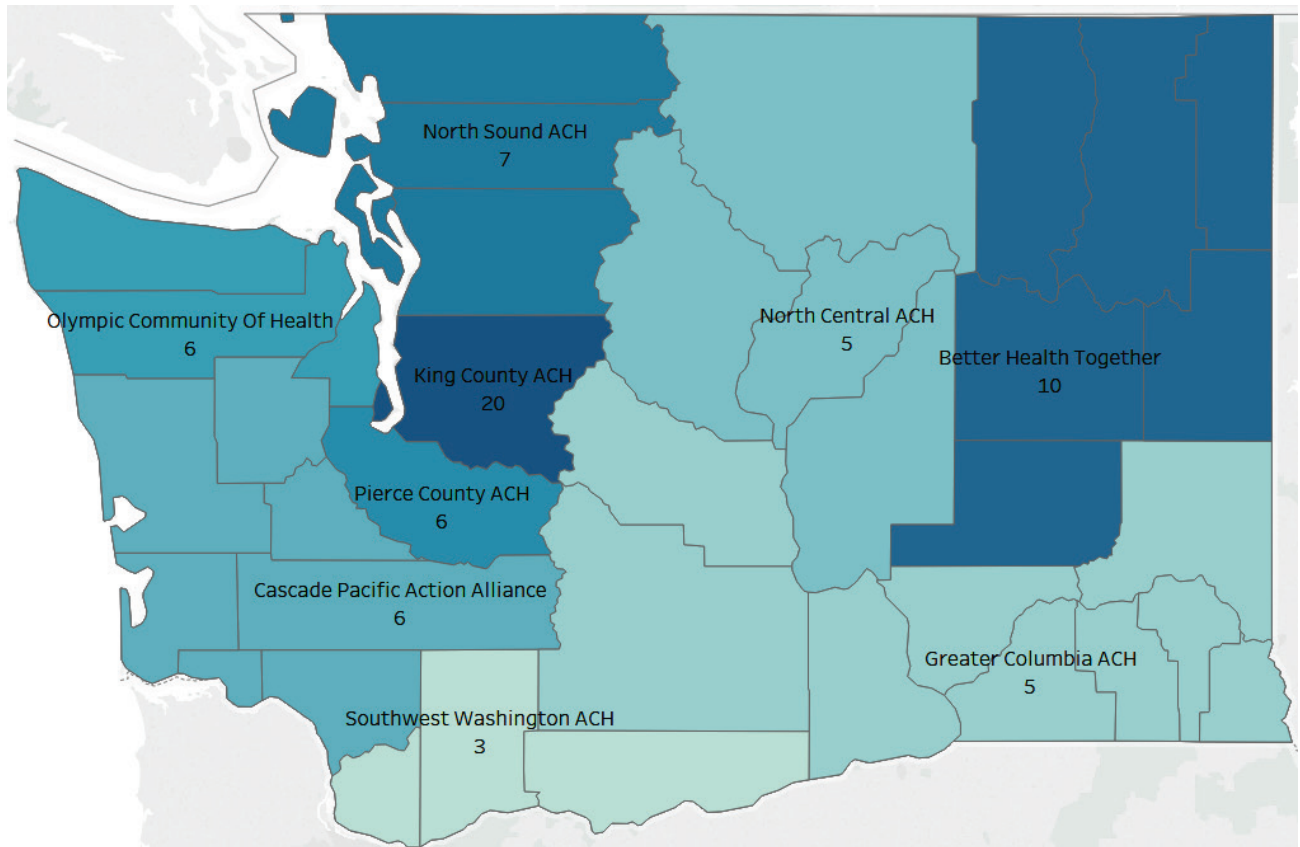
### ACH – Supply of Psychiatrists

The King County ACH was the sole ACH with a rate of psychiatrists above the state rate of 10 psychiatrists per 100,000 population. The King County ACH rate of 20 physicians per 100,000 population was twice the statewide rate. It was more than six times as large as the lowest rate of three psychiatrists per 100,000 population (Southwest Washington ACH).

Chart 46. Ranking of Psychiatrist Rates (per 100,000) by ACH, 2016



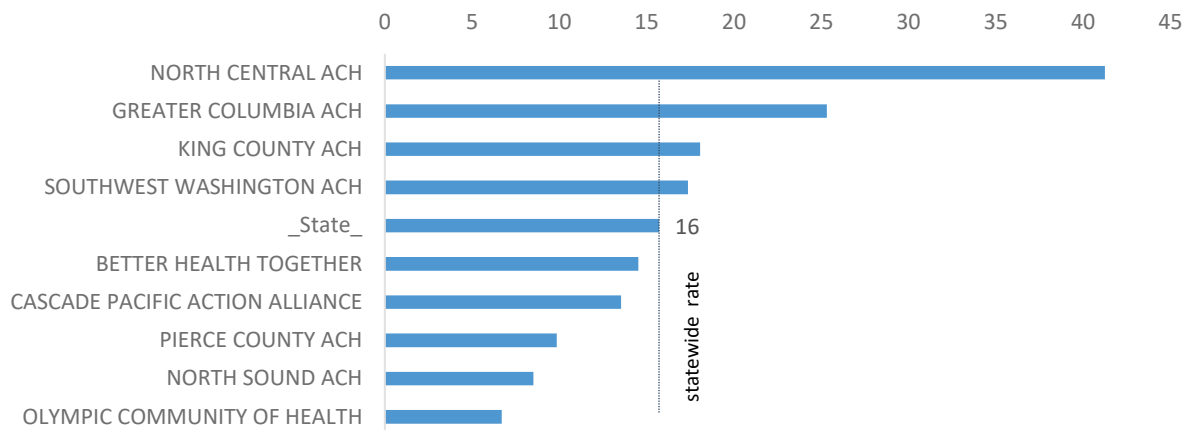
Map 33. Psychiatrists per 100,000 Population, ACHs, 2016



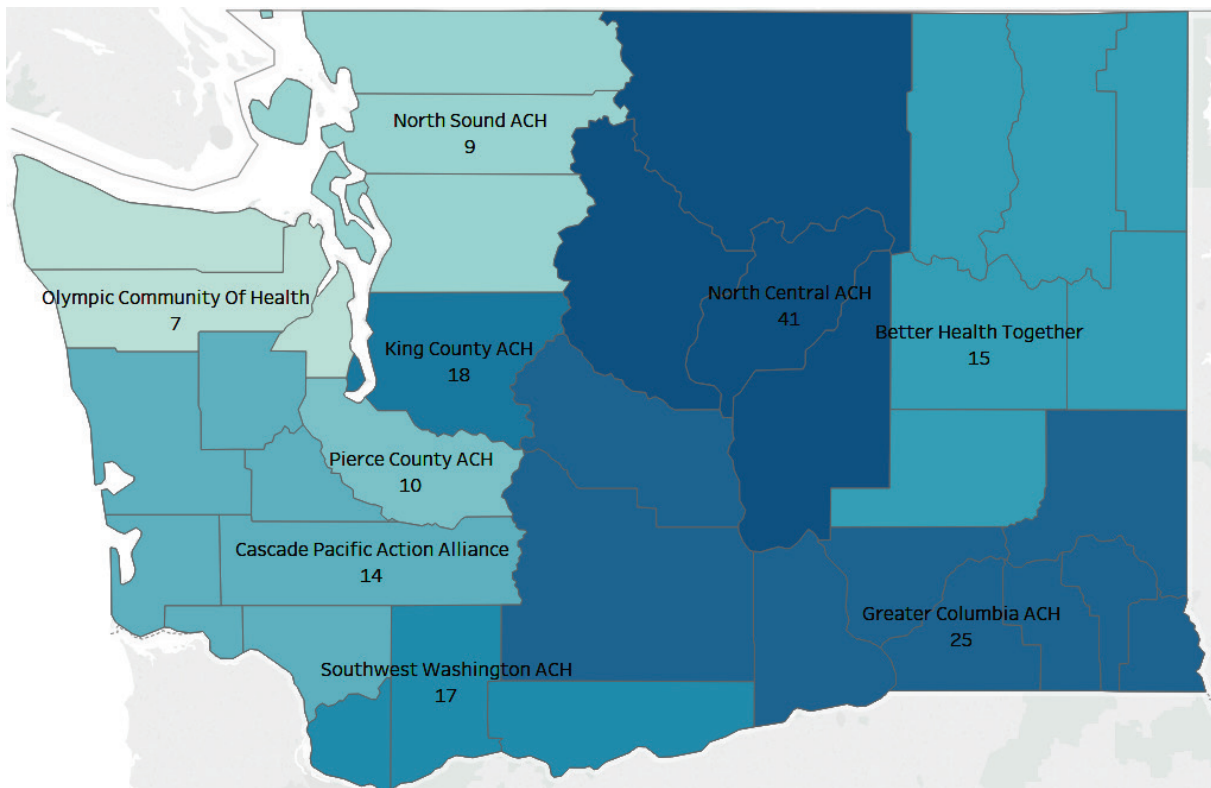
### ACH – Supply of Radiologists

The statewide supply of radiologists was 16 physicians per 100,000 population. The North Central ACH was the leader among the ACHs in the rate of radiologists, with a rate of 41 physicians per 100,000 population. This rate was more than twice as large as the statewide rate. Three other ACHs also had rates higher than the statewide rate: Greater Columbia ACH at 25, King County ACH at 18, and Southwest Washington ACH at 17. There was a very large gap between the highest rate and lowest rate. The highest rate of 41 physicians was nearly six times as large as the lowest rate of seven radiologists per 100,000 population (Olympic Community of Health).

Chart 47. Ranking of Radiologist Rates (per 100,000) by ACH, 2016



Map 34. Radiologists per 100,000 Population, ACHs, 2016

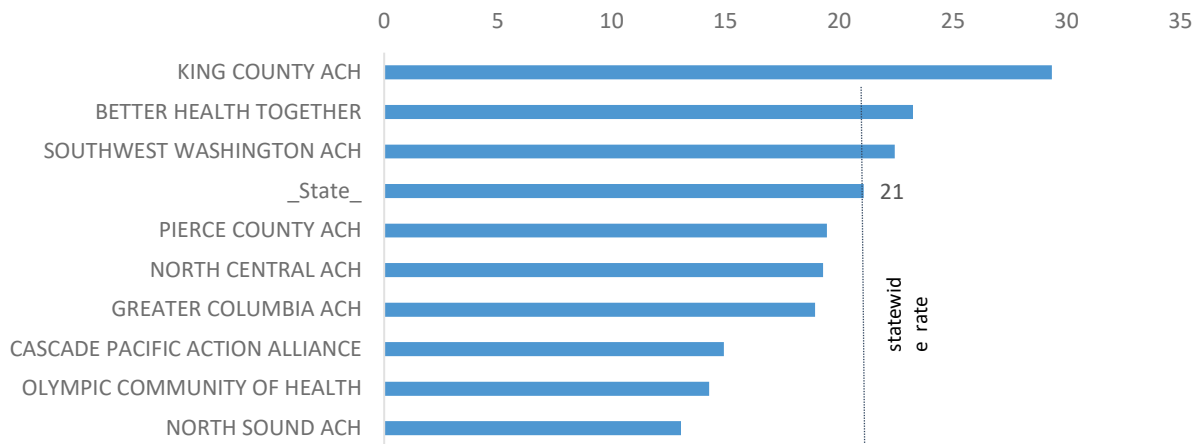




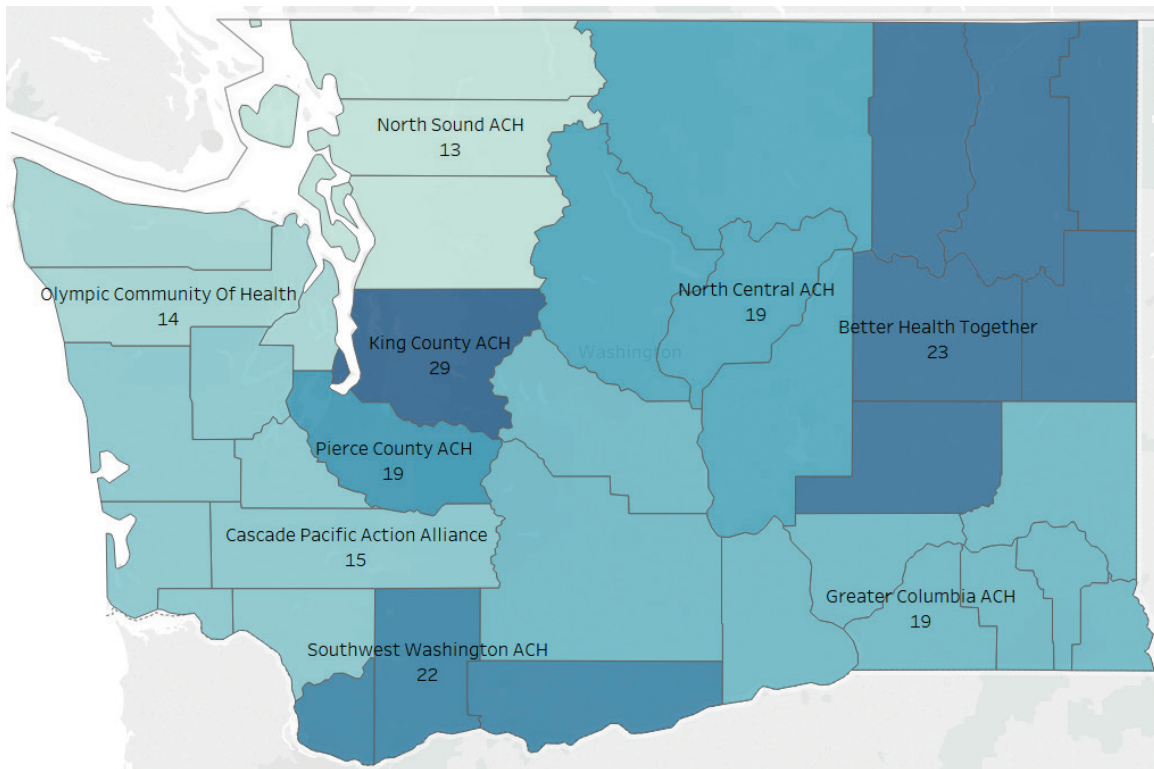
### ACH – Supply of Surgeons

The ranking of surgeon rates for the ACHs fall into three natural groups each consisting of three ACHs. The top three, all with rates above the statewide rate of 21 physicians per 100,000 population, include the King County ACH, Better Health Together and Southwest Washington ACH with rates of 29, 23 and 22 physicians, respectively, per 100,000 population. The second group consists of the Pierce County ACH, North Central ACH and Greater Columbia ACH. All three ACHs in this group had a rate of 19 physicians per 100,000 population. The last group had the lowest rates: Cascade Pacific Action Alliance at 15, Olympic Community of Health at 14 and North Sound ACH at 13 physicians per 100,000 population.

Chart 48. Ranking of Surgeon Rates (per 100,000) by ACH, 2016



Map 35. Surgeons per 100,000 Population, ACHs, 2016

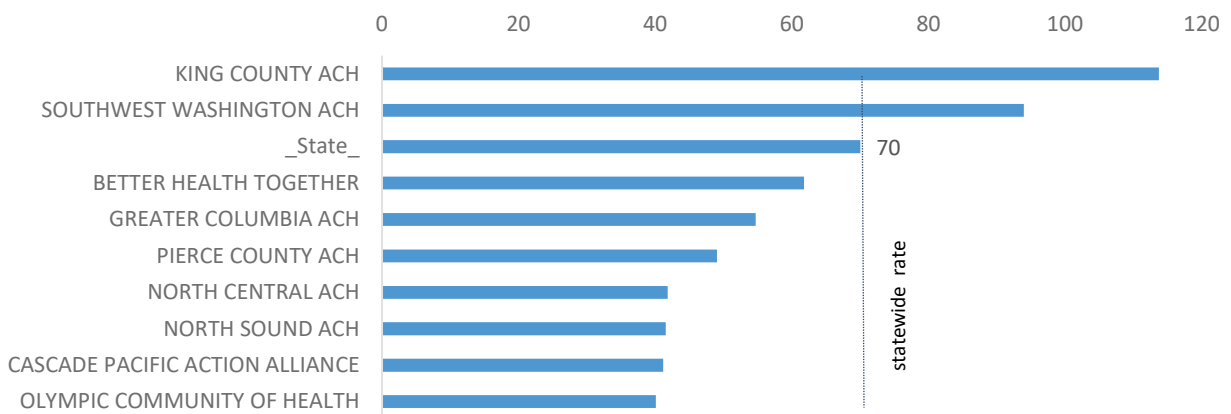


### ACH – Supply of Other Specialty Physicians

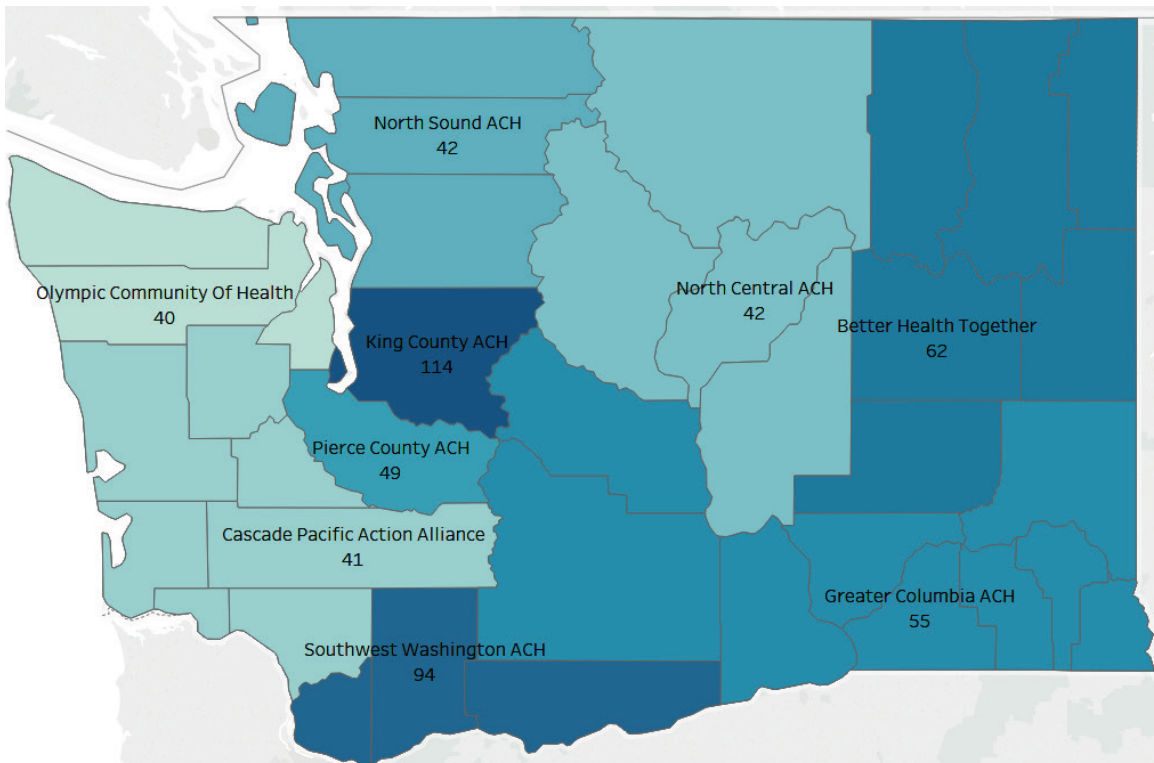
Other specialties include those not listed in previous charts for ACH physician rates, such as dermatology, otorhinolaryngology, oncology, pain medicine and urology. These specialties each had relatively small numbers of physicians.

King County ACH and Southwest Washington ACH led the other ACHs as the only ACHs with rates above the state rate of 70 physicians per 100,000 population. King County ACH had a rate of 114 physicians and Southwest Washington ACH had a rate of 94 physicians per 100,000 population. The highest rate (King County ACH) is nearly three times the rates of the bottom four ACHs at about 40 physicians each per 100,000 population.

Chart 49. Ranking of Other Specialty Physician Rates (per 100,000) by ACH, 2016



Map 36. Other Specialty Physicians per 100,000 Population, ACHs, 2016





## Summary

In 2016, Washington state's physician supply was 261 physicians per 100,000 population, which was above the national level of 237 physicians per 100,000 population. In total, 18,730 physicians practiced in Washington. Compared with the state's overall workforce, physicians were 8 years older with a median age of 50 and were less likely to be women (37% among physicians vs. 42% among total workforce). The gender mix in the physician workforce has been changing in recent years with more female physicians joining the workforce. Of the currently practicing physicians, 450 male and 450 female physicians were added in 2014, departing from a long trend in which the growth of female physician supply was only half of the male physician supply growth. Statewide, 37 percent of physicians were primary care physicians (PCPs).

While statewide overall physician supply places Washington above the national average, there is considerable disparity in physician supply and characteristics across counties and the Accountable Communities of Health (ACHs). The largest disparities in physician supply and characteristics occurred at the county level. Although, in general, the most populous counties have larger rates of physician supplies, some small counties had the highest rates in certain specialties. Disparities in physician supplies and differences in physician characteristics at the ACH level were not as great as at the county level, because most ACHs consist of a group of counties (which reduced the effect of extreme outliers).

At the county level, overall physician supply ranged from 19 to 402 physicians per 100,000 population (in Wahkiakum County and Chelan County, respectively); median physician age ranged from 47 to 63 (Clark County and Garfield County, respectively); share of female physicians ranged from 2 percent to 42 percent (Garfield County and Columbia County, respectively); PCP supplies had a range of 15 to 143 physicians per 100,000 population (again, Garfield County and Columbia County, respectively); and specialist physician rates ranged from 4 to 275 physicians per 100,000 population (Wahkiakum County and Chelan County, respectively).

Differences at the ACH level were not as large as at the county level because, except for the King County ACH and the Pierce County ACH, each ACH consists of a group of counties, which smoothed out the extreme values associated with individual counties. The King County ACH led the other ACHs in physician-to-population rates for overall physicians (371 per 100,000 population), PCPs (122 per 100,000 population) and 7 out of the 10 specialties examined as well as in percentage of female physicians (42 percent). Physicians in the Southwest Washington ACH had the youngest median age (47). On the opposite end, the Olympic Community of Health had the lowest rates, 176 overall physicians and 75 PCPs per 100,000 population. The lowest physician-to-population rates in the 10 specialties were found in three ACHs – the North Sound ACH, the Olympic Community of Health and the Southwest Washington ACH. The Greater Columbia ACH and the Olympic Community of Health had the oldest median physician age, 53. The Greater Columbia ACH also had the lowest percent of female physicians at only 26 percent.

Analysis in this report is made possible with the availability of the Network Access Reports which health insurance carriers provide to the Washington State Office of the Insurance Commissioner. This report marks the first-time use of the NARs for health provider supply analysis. While estimates using the NARs are generally comparable to estimates from other existing data sources, the monthly Network Access Reports allow for more timely estimates.

## Appendixes

## Data Sources and Method

### Data Sources

*Network Access Report.* Health insurance companies conducting business in Washington are required by the state's Office of the Insurance Commissioner (OIC) to file a monthly Network Access Report (NAR). The purpose of these reports is for an insurance company to demonstrate that it has an adequate supply of health care providers in its network(s) for the intended services. The report contains records of health care providers in contract with an insurance company's provider network. The information on individual providers includes name, credential, specialty, and practice location(s). The NARs are publicly available on OIC's website. This study used the public NARs.

*National Provider Identifier Registry.* The National Provider Identifier (NPI) registry is a database in the National Plan & Provider Enumeration System (NPPES) created by the federal Centers for Medicare and Medicaid Services (CMS). The NPI is a 10-digit unique number assigned only once to an individual or organizational provider in the U.S. Part of the NPI database is publicly available. The public information of individual NPIs includes a provider's name, NPI number, taxonomy and practice location. The public NPI data were used for this study.

*Provider License Database.* Health care providers are required to obtain a provider license with the Washington State Department of Health (DOH) in order to practice in the state. After initial license approval, providers are required to obtain renewal at certain intervals depending on the professions. For physicians, the license renewal is every two years. The provider license database includes information on the provider's name, age, sex, credential type, license start date and expiration date. A subset of the provider license information can be searched as public information on the department's website. However, for this study, we used an extract file from the license database.

### Method

#### *a. Processing the December 2016 Network Access Reports*

Although more recent Network Access Reports were available at the beginning of this study, we chose to use the December 2016 reports as this time frame would allow this study's results to be compared with other available studies for the same time frame. The NARs were downloaded from OIC's website. Once all insurance companies' reports were collected, the reports were combined and only physician records were retained.

In the source data, the address of a location could be entered into the database differently by different companies and sometimes even by the same company. This situation would cause the data processing software to treat address variants of the same location as different locations. To address this issue, all unique addresses as found in the original data source were assigned geo-coordinates using Google Maps. The geo-coordinates were then used as the location identifiers in place of addresses.

A last step was to select only one physician record for each location and for each primary specialty, if a physician was reported to have more than one primary specialty.

*b. Matching physicians records from the Network Access Reports with records in the National Provider Identifier registry and the DOH provider license database*

Processed physician records from the Network Access Reports were then matched with the National Provider Identifier registry on the NPI numbers. The NPI is a unique identifier issued to health care providers. It is required for Medicare services, but is also used by health insurance carriers. For the matching between NAR records and the NPI, only matched records were retained. The retained records from this step were then matched with the DOH license database on the physician credential number. In this step, only matched records with non-expired licenses as of December 2016 were retained (N=18,730). These two matching steps were taken to remove questionable NAR records.

*c. Constructing physician record weights*

The processed NAR data included multiple records for some physicians who had multiple practice locations and/or more than one primary specialty. Physician supply analyses of this study required counting each physician as no more than one person. To meet this requirement while accounting for the fact that a physician may have multiple primary specialties and/or practice at multiple locations, we constructed data weights and applied the weights to the physician records. Below is a description of the weight construction.

*Initial weight.* Each physician was assigned the weight of 1 initially. If a physician was associated with more than one primary specialty, then the initial weight would be redistributed equally among the primary specialties. For example, if a physician had two primary specialties, each primary specialty would receive an initial weight of 0.5.

*ZIP Code level weight.* After the construction of initial weights, the next step was to redistribute initial weights to a physician's records for different ZIP Codes associated with a primary specialty. To construct the ZIP Code level weight, we first counted the number of ZIP Codes associated with a physician's specialty. We then summed up the populations of the associated ZIP Codes.<sup>10</sup> Then each ZIP Code's fraction of the total population from all associated ZIP Codes was calculated. These fractions were finally used in distributing the initial weight into ZIP Codes associated with a physician's primary specialty.

For example, suppose the initial weight for one of a physician's two primary specialties, say internal medicine, was 0.5. Further, suppose this specialty of the physician was associated with three ZIP Codes that accounted for 70 percent, 20 percent and 10 percent of the total population of the three ZIP Codes combined. The ZIP Code with 70 percent of the population would receive 70-percent of the initial weight for the primary specialty, thus, 0.35 (i.e.,  $0.5 \times 70\%$ ), the 20-percent ZIP Code would receive a weight of 0.1 and the 10-percent Zip would receive a weight of 0.05.

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<sup>10</sup> Some ZIP Codes in the original Network Access Reports do not have associated population data. These are either institution ZIP Codes (e.g., campus ZIP Code for universities) or mailbox ZIP Codes. Online ZIP Code maps were used to choose a substitute ZIP Code. The substitute ZIP Code is one that either encircles or shares the longest borderline with the ZIP Code in question.

Sometimes, a physician's primary specialty was associated with multiple locations within a ZIP Code area. In that case, each location would receive an even share of the ZIP Code-level weight assigned previously. Extending the physician example above, suppose the physician's internal medicine specialty was associated with three locations in the 70-percent ZIP Code area. Then the final weight for each location record for this ZIP Code associated with this physician's internal medicine specialty would be 0.1167.

From this process, the sum of weights of all records associated with a physician should equal 1 and the sum of weights of all physicians should equal the unique count of physicians without the weights. The ZIP Code level weights can be used for analyses involving a single ZIP Code, clusters of ZIP codes and the state.

*County level weight.* For county-level analyses, an additional step was necessary to further distribute the physician record weight at the ZIP Code-level for ZIP Codes that cross county boundaries. Similar to the approach used in constructing ZIP Code-level weight, a county's fraction of such a ZIP Code's weight was determined by the county's fraction of the population for that ZIP Code in relation to the total population of the ZIP Code. Using the same physician example from above, suppose the 20-percent ZIP Code is associated with two counties and County A's population fraction of the ZIP Code's total population is 70 percent and County B's fraction is 30 percent. Then the ZIP Code-level physician record weight of 0.1 is redistributed into 0.07 to County A and 0.03 to County B. For ZIP Codes whose areas are within the boundary of a single county, the ZIP Code-level weights were then copied over to the county-level weight.

From this process, the sum of weights of all records associated with a physician should equal 1 and the sum of weights of all physicians should equal the unique count of physicians without the weights. The county-level weights can be used for analyses involving a single county, regions consisted of counties and the state.

#### *d. Definition of terms*

Physician count: The weighting of physician records takes into consideration that a physician can have more than primary specialty and may practice at multiple locations. This weighting essentially assumes each physician identified in the NARs as working 100 percent full-time-equivalency (FTE). The physician's "FTE" is then distributed into primary specialties and then to practice locations in different ZIP Code areas and into different counties when a ZIP Code area crosses county boundaries. So, one physician FTE at a specific area can sometimes mean several physicians each contributing a fraction to the FTE. The physician count then is a sum of the total fractions.

Specialty: A specialty in medicine is a branch of medical practice. A physician generally has one primary specialty and sometimes one or more secondary specialties. For this study, specialty refers to a physician's primary specialty as reported by the health insurance companies in their Network Access Reports. In some cases, different companies may list different primary specialties for the same physician.

PCP/Specialist physicians: PCP refers to a physician who provides both the first contact for a person with an undiagnosed health concern as well as continuing care of varied medical conditions, not limited by cause, organ system, or diagnosis.<sup>11</sup> Physicians whose practice is not mainly in primary care are specialists. Although what a physician does in his/her practice should be used to describe the physician as a PCP or specialist, in reality it is quite difficult to collect such information. Instead, analysts generally classify

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<sup>11</sup> See [https://en.wikipedia.org/wiki/Primary\\_care\\_physician](https://en.wikipedia.org/wiki/Primary_care_physician).

physicians practicing with certain specialties as PCPs, although not all analysts agree on the set of specialties. For this study, primary care specialties include the following: family medicine, general practice, geriatrics, internal medicine and pediatrics.

Physician rate: A physician rate is calculated as the number physicians for a given population size of a specific geographic area. The usual population size used is 100,000. Although physicians in certain specialties treat only specific groups of the population, such as physicians in pediatrics and OB/GYN, the physician rate calculation is still based on the overall population, not the population groups for whom those physicians provide care generally. For this study, the physician rate is calculated as number of physicians per 100,000 population for the state, counties and Accountable Communities of Health (each consisting of one or more counties).

Urban/Rural areas: There are many ways urban and rural areas are assigned. For this study, we adopted the system used by the Missouri Census Data Center (MCDC). The MCDC's method in turn is based on the U.S. Census Bureau's method, which defines an urban area as "a core census block or blocks that have a population density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile."<sup>12</sup> MCDC converted census blocks to ZIP Code areas. A ZIP Code area is then given urban and rural population proportions. Most ZIP Codes are either 100 percent urban or 100 percent rural. We used the MCDC's ZIP Code to Urban/Rural Area crosswalk file to designate a physician's location as urban or rural. In cases of a ZIP Code split between urban and rural, the urban/rural population proportions in the MCDC's file was used to proportionately randomize the physician's practice location as urban or rural.

#### *e. Limitations*

The Network Access Report is the main data source for physician supply estimates in this study. As such, data accuracy in NARs would affect the quality of the estimates. There are two possible sources of errors that may affect data accuracy in NARs and consequently estimates in this study, although neither type of error is expected to be large. One source is the omission of providers who are not affiliated with any insurance networks. Often these providers include some solo practitioners, some in small practice groups and those who work for the federal or state institutions exclusively (e.g., VA hospitals, military hospitals and state hospitals). This error would result in under-counting the physician supply. The other source of error would do the opposite – over-counting the physician supply. This type of error occurs when insurance companies failed to remove promptly records from NARs for providers who no longer practice in Washington (retirement or move to another state, for example), although still keeping a Washington state license.

These two errors, because of their opposite effect, may have worked to reduce each other's impact, to a certain degree. Without a perfect census of the providers, though, it is impossible to quantify these two errors precisely and their overall effect on physician supply estimates. However, a comparison we conducted as a validity check between estimates from this study and available estimates of the same measures from two other sources shows that in most cases estimates from this study are quite comparable to other source estimates. The following table shows a few examples from the comparison.

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<sup>12</sup> See <http://mcdc.missouri.edu/TenThings/urbanrural.shtml>.

Comparison of Estimates for Select Specialties from Three Sources

	Count			Percent		
	OFM	DOH MQAC	UW CHWS	OFM	DOH MQAC	UW CHWS
Family Medicine/General Practice	3,291	2,385	3,046	15.4%	15.0%	18.5%
Obstetrics-gynecology	875	629	843	4.2%	4.0%	5.1%
Psychiatry	721	819	727	3.7%	5.2%	4.4%
Total Physicians	18,730	15,861	16,481			

## Data Sources:

1. OFM – Washington State Office of Financial Management. Source for this study.
2. DOH MQAC – Washington State Medical Quality Assurance Commission (<https://www.doh.wa.gov/Portals/1/Documents/Pubs/657-130.pdf>), created on October 16, 2017 for October 1, 2015–September 30, 2017 Physician Demographic Census.
3. UW CHWS – University of Washington Center for Health Workforce Studies (<http://depts.washington.edu/fammed/chws/wp-content/uploads/sites/5/2015/09/washington-states-physician-workforce-in-2016.pdf>)

In addition to potential errors associated with the source data, another potential error may exist due to the weighting method used. Recall that when a physician has multiple primary specialties, the initial weight of 1 is distributed evenly to each primary specialty. With no weighting or splitting a physician's FTE, the analyst would have to choose a primary specialty arbitrarily to represent such a physician. While the weighting method used in this analysis improves the distribution of physician practice time across their primary specialties, it still lacks precision. Physicians may spend disproportionately more time in one primary specialty. Similarly, in the case of a physician who practiced in a specialty in more than one ZIP Code area, the initial weight was redistributed based on each ZIP Code area's population fraction to the combined population of all ZIP Code areas in question; or, in constructing county-level weight involving a ZIP Code area that crosses county boundaries, the ZIP Code-level weight was redistributed based on each county's population fraction to the ZIP Code area's total population. These ZIP Code-level and county-level weighting techniques no doubt improve the estimation of the physician distribution when compared with the situation in which the analyst has to arbitrarily choose which ZIP Code area and county to assign the physician. However, the precision resulting from these weighting schemes remains unknown.

Yet another issue, though not necessarily a source of error, is that this study's method does not take into consideration physicians in bordering states who provide services to Washington residents. For example, Clark County sits across the Columbia River from the greater Portland area in Oregon. Some Clark residents use physician services in the Portland area, thus providing Clark County residents with a larger supply of physicians than estimated in this report.

## Data Tables

Table 3. Physician Count, Characteristics and Rates, Statewide, 2016

	Total	Male	Female
Overall Count			
All Physicians	18730	11850	6880
Characteristics			
% Female	36.7%		
Median Age	50	53	45
% Licensed Since 2000	60.4%	54.0%	71.4%
% Rural	6%	6%	5%
% PCP	36.8%	31.3%	46.1%
Rates Per 100,000 Population			
Family Medicine	40.8		
Internal Medicine	37.8		
Surgery	21.1		
Emergency Medicine	19.0		
Radiology	15.7		
Anesthesiology	15.3		
OB-GYN	12.2		
Pediatrics	11.8		
Psychiatry	10.0		
Cardiology	7.0		
Ophthalmology	5.5		
Neurology	5.3		
General Practice	5.0		
Gastroenterology	4.6		
Physical Medicine	4.2		
Pathology/Lab Medicine	4.1		
Hematology	4.0		
Dermatology	3.8		
Oncology	3.8		
ENT	3.5		
Adolescent Medicine	3.3		
Allergy/Immunology/Infectious Disease	3.2		
Urology	3.1		
Orthopedics	2.6		
Pulmonology	2.5		
Nephrology	2.1		
Endocrinology	2.0		
Rheumatology	1.5		
Neonatology	1.4		
Pain Medicine	0.7		
Women's Health	0.6		
Sleep Medicine	0.5		
Geriatrics	0.5		
Genetics	0.4		
Sports Medicine	0.4		
Behavioral/Mental Health/Addiction Medicine	0.3		
Preventive Medicine	0.2		
_Other	0.7		



Table 4. Physician Count, Characteristics and Rates, County, 2016

County	Physician Count and Characteristics				Physicians per 100,000 population													
	Count	Median Age	% Female	% Licensed Since 2000	Overall	PCP	Specialist	Anesthesiology	Cardiology	Emergency Medicine	Family Medicine	Internal Medicine	OB/GYN	Pediatrics	Psychiatry	Radiology	Surgery	Other Specialties
State	18,730	50	37	60	261	96	165	15	7	19	41	38	12	12	10	16	21	70
Adams	22	54	20.9	51.4	113	54	59	0	10	25	44	5	8	1	1	6	4	8
Asotin	66	55	23.5	56.8	298	131	167	14	4	25	58	63	9	9	0	18	35	63
Benton	580	51	25.7	67.9	305	94	211	33	13	22	29	38	11	13	5	36	29	77
Chelan	305	50	28.4	60.5	402	127	275	25	10	26	61	51	16	13	15	52	42	91
Clallam	150	58	31.8	52.7	204	99	106	8	7	15	58	31	10	8	7	6	15	41
Clark	1,215	47	39.5	72.6	263	122	141	7	5	11	30	43	13	13	3	16	23	99
Columbia	5	57	42.0	22.3	111	88	23	0	0	23	88	0	0	0	0	0	0	0
Cowlitz	198	50	32.2	60.7	189	83	106	6	4	16	23	31	8	5	6	10	22	58
Douglas	28	53	31.6	52.1	70	39	30	0	0	6	28	6	0	4	0	20	1	4
Ferry	9	62	29.4	45.1	112	81	31	0	1	19	80	0	0	0	0	7	4	1
Franklin	115	52	25.2	65.7	129	41	88	3	1	18	19	14	9	6	1	31	8	20
Garfield	3	63	2.2	4.6	149	143	7	1	0	1	139	3	0	0	0	1	1	3
Grant	153	50	28.2	65.9	162	66	96	1	3	16	38	16	10	10	1	32	10	23
Grays Harbor	102	53	23.2	58.0	141	50	90	7	8	30	23	22	2	5	0	21	9	13
Island	77	57	26.0	53.0	93	39	54	9	0	9	14	15	5	6	3	3	10	19
Jefferson	54	53	37.4	59.5	173	72	101	0	3	28	38	34	7	0	13	3	30	16
King	7,807	49	41.7	58.8	371	122	249	23	9	24	49	52	16	17	20	18	29	114
Kitsap	443	51	33.9	57.5	169	69	100	10	4	10	36	25	9	6	5	7	12	43
Kittitas	64	59	20.6	43.9	146	57	89	0	0	25	37	18	7	1	1	0	29	29
Klickitat	45	52	23.1	62.2	211	88	123	0	0	13	67	6	3	0	0	61	26	36
Lewis	155	51	29.2	66.2	202	104	98	9	4	22	37	53	3	12	2	22	11	27
Lincoln	6	50	26.6	73.9	61	34	27	0	2	3	17	10	0	0	3	4	8	15
Mason	70	50	33.0	61.6	113	52	61	0	3	20	28	15	11	8	2	6	7	14
Okanogan	98	53	25.9	62.7	234	78	156	2	10	23	61	14	8	2	1	62	18	32
Pacific	39	58	12.1	58.5	186	53	133	0	3	38	34	9	5	1	2	51	19	24
Pend Oreille	13	48	22.9	55.0	95	35	60	11	2	13	34	1	0	0	0	9	11	14
Pierce	1,853	49	33.9	61.5	219	77	143	20	5	24	34	31	12	10	6	10	19	49
San Juan	30	57	18.8	49.8	183	89	94	0	22	46	60	24	4	5	6	0	1	16
Skagit	328	53	29.2	53.3	268	103	165	6	10	18	51	39	12	11	13	15	23	70
Skamania	4	51	32.4	34.2	35	24	12	0	0	0	21	0	0	0	9	1	1	4
Snohomish	1,340	49	40.5	60.4	173	77	96	8	6	13	37	31	8	9	5	8	12	38
Spokane	1,436	51	31.5	60.9	291	105	186	17	11	21	45	47	13	12	11	16	26	72
Stevens	42	54	36.0	47.8	95	63	33	0	1	9	46	16	2	0	0	4	9	8
Thurston	631	51	37.6	56.0	231	96	135	16	4	14	47	33	13	15	9	10	16	54
Wahkiakum	1	51	8.3	24.0	19	15	4	0	0	0	13	1	0	0	2	0	1	1
Walla Walla	208	54	18.0	58.4	343	145	198	23	11	23	41	50	7	7	4	36	32	109
Whatcom	445	52	35.5	57.5	209	88	122	18	5	8	52	22	9	11	10	10	14	50
Whitman	97	52	34.2	56.7	202	70	132	0	5	18	46	17	7	6	10	41	18	34
Yakima	492	53	28.7	62.0	196	69	127	11	11	15	29	25	17	11	7	15	10	46

Table 5. Physician Count, Characteristics and Rates, ACH, 2016

	Physician Count and Characteristics				Physicians per 100,000 population													
	Count	Median Age	% Female	% Licensed Since 2000	Overall	PCP	Specialist	Anesthesiology	Cardiology	Emergency Medicine	Family Medicine	Internal Medicine	OB/GYN	Pediatrics	Psychiatry	Radiology	Surgery	Other Specialties
State	18,730	50	37.0	60.0	261	96	165	15	7	19	41	38	12	12	10	16	21	70
Better Health Together	1,527	51	31.3	60.3	260	97	163	14	10	20	45	41	11	10	10	15	23	62
Cascade Pacific Action Alliance	1,198	51	33.3	58.6	195	83	112	10	4	19	36	31	9	10	6	14	15	41
Greater Columbia ACH	1,629	53	25.8	62.4	229	80	149	15	9	19	32	29	12	10	5	25	19	55
King County ACH	7,807	49	41.7	58.8	371	122	249	23	9	24	49	52	16	17	20	18	29	114
North Central ACH	584	51	28.1	61.9	231	82	149	8	6	19	47	24	10	9	5	41	19	42
North Sound ACH	2,220	50	37.1	58.4	184	79	105	9	6	13	39	29	9	9	7	9	13	42
Olympic Community of Health	647	53	33.7	56.6	176	75	101	9	5	13	41	27	9	6	6	7	14	40
Pierce County ACH	1,853	49	33.9	61.5	219	77	143	20	5	24	34	31	12	10	6	10	19	49
Southwest Washington ACH	1,264	47	38.9	72.1	256	119	137	7	5	11	31	40	12	12	3	17	22	94

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