



# 2019-20 PHYSICIAN SUPPLY

Estimates for Washington State

Office of Financial Management  
Health Care Research Center

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## 2019-20 Physician Supply: Estimates for Washington State

### Executive Summary

Washington state's physician supply continued to grow in 2020. In fact, it had one of the largest increases in recent years. The net gain was 906 physicians, with the total number of physicians increased from 19,657 in 2019 to 20,563. The physician rate has also increased from 260 to 269 physicians per 100,000 population, suggesting that the physician supply had a faster growth pace than that of the general population.

Although the number of male physicians and the number of female physicians both increased, the supply of female physicians grew slightly faster, resulting in an increase in their share of the total physician supply, from 38.6% in 2019 to 39.4% in 2020.

There was no change in the median age of 49 for the total physicians in 2020. Female physicians continued to have lower a median age, remaining at 49 years, compared to male physicians' median age which increased from 51 in 2019 to 52 in 2020.

The shares of primary care physicians and specialists remained the same at 34% (6,971) and 66% (13,592), respectively.<sup>1</sup> This means that both groups experienced a growth proportionate to their distribution in 2019. The distribution of physicians in individual specialties changed little as well, with slight increases in shares of Family Medicine/General Practice, Emergency Medicine and Hospitalist and slight decreases in Internal Medicine (General), OB/GYN, Pediatrics (General) and the Other Specialty. None of the share changes exceeded half a percentage point in either direction. Family Medicine/General Practice and Internal Medicine (General) continued to be the two largest specialties except for Other Specialty. These two specialties accounted for 17.2% and 11.7%, respectively, of the total physician supply in 2020.

Among Washington's counties, the distribution of physicians in 2020 is more or less in line with that in 2019. However, physician shares increased or stayed the same in 17 counties while decreased in 22 counties. In the four most populous counties (King, Pierce, Snohomish and Spokane), the physician shares increased. King County's share was 42.8% in 2020, the largest share and far greater than any other county's share. All other counties had shares that were below 10%, with twenty-five counties' shares below 1%.

Physician rates varied widely among the counties and that was true for both 2019 and 2020. Chelan County continued to lead the other counties with a rate of 497 physicians per 100,000 population in 2020, although down from its rate of 557 in 2019. Chelan's rate in 2020 is 16 times as high as the lowest rate of 30 per 100,000 population in Skamania County.

Washington created nine Accountable Communities of Health (ACHs) to improve population health through coordination among providers. Each ACH consists of a county or group of counties. As the case at the county level, shares of physicians and physician rates varied widely among the ACHs, although at a smaller scale. The share distribution of physician supply among the ACHs was approximately the same in 2020 as in 2019, but the range widened. The HealthierHere (King County) ACH's lead increased from 41.2%

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<sup>1</sup> For this report, primary care physicians (PCP) refer to those practicing in the following four specialties: Family Medicine/General Practice, Geriatric Medicine, Internal Medicine (General) and Pediatrics (General). The remainder constitutes the specialist group.

of the total physician supply in 2019 to 42.8% while the smallest share of 3.3% in 2019 in the Olympic Community of Health became slightly smaller to 3.1%. Due to its far larger share of the state's total physician supply, HealthierHere continued to be the only ACH with a physician rate above the state average rate. Its rate of 390 physicians per 100,000 population in 2020 represented an increase from its rate of 364 in 2019. In comparison, the Olympic Community of Health's rate dropped from 171 to 168 physicians per 100,000 population.

Estimates for physician demographics and specialties for counties and ACHs in 2019-20 are published in separate reports on the Office of Financial Management's Health Care webpage.

Finally, the appendix at the end documents the data sources and method used for this report.

## Key Findings

- *Overall physician supply.* Washington physician supply saw the largest year-to-year increase since this study began in 2016. It increased by 906 to 20,563 physicians in 2020. This means that Washington now has 269 physicians per 100,000 population, an increase from 260 physicians in the previous year, suggesting that the growth in physician supply continued to outpace the general population growth.
- *Median age of physicians.* The median age of Washington's physicians remained the same at 49 years in 2020 as in 2019.
- *Share of female physicians.* The share of female physicians had another year-to-year increase in 2020, from 38.6% in 2019 to 39.4%.
- *Age difference between female and male physicians.* Male physician median age increased by one year to 52 in 2020 while female physician median age remained the same at 45.
- *Physician supply by specialty.* The increase in the number of physicians was evident in all specialty categories adopted for this report, except in the categories of OB/GYN and Pediatrics (General) in which there was a slight decrease. However, the distribution in the share of physicians among the specialty categories remained relatively intact from the previous year. Neither an increase nor a decrease exceeded half percentage point in any of the specialty categories. The Family Medicine/General Practice category was the second largest group of physicians (3,533 or 17.2%). The Internal Medicine category was the third largest group of physicians (2,410 or 11.7%). The category with the largest number of physicians was the balance category of "Other Specialty" which had 5,600 or 27.2% of the total physicians. The remaining specialty categories each had 600-1,500 (3-7%) physicians.
- *Supplies of primary care physicians and specialist physicians.* The increase in the total physician supply in 2020 did not change the 34%/66% split between primary care physicians (PCPs) and specialists, suggesting that the increase was proportionate to the number of physicians in these two broad categories. In 2020, there were 6,971 PCPs and 13,592 specialists. That is equivalent to 91 PCPs and 178 specialists per 100,000 population.
- *Physician supplies in counties.* Despite the increase statewide in physician supply, more than half of the counties saw a decrease. Nearly all these counties with a decrease are less populous counties. Most of the increase went to the four most populous counties (King, Pierce, Snohomish and Spokane). The distribution of physicians among the counties in 2020 was essentially the same as in 2019. King County continued to have the largest share which increased from 41.2% in 2019 to 42.8%. The next three most populous counties had a combined total of 23.8%, an increase from 22.7% in 2019. The rest of the counties accounted for a reduced share of 33.4% in 2020 from 36.1% in 2019.
- *Physician supplies in Accountable Communities of Health.* The HealthierHere ACH with King County as the only county also had the largest physician share (41.2% in 2019 and 42.8% in 2020) of all ACHs. Elevate Health (also a one-county ACH – Pierce County) was another ACH whose share increased, from 8.4% in 2019 to 9.2% in 2020. In the remaining ACHs, the share in 2020 was either the same as or smaller than the share in 2019.

## Total Physician Supply

Washington state's supply of physicians in direct patient care had the largest year-to-year increase in 2020 since 2016, the first year of physician supply we reported. The net increase in direct patient care physicians was over 900, from 19,657 in 2019 to 20,563 (Figure 1). There was also an increase of total licensed physicians, from 31,488 in 2019 to 31,940 in 2020.<sup>2</sup> The net increase of 452 licensed physicians is about half the size of the net increase in direct patient care physicians, suggesting some physicians who did not practice but were licensed in Washington in 2019 started practicing in the state in 2020. The growth in physician supply again outpaced the population growth and resulted in an increase in the number of physicians from 260 to 269 per 100,000 population (Figure 2).

Figure 1. Physician Licenses and Physicians Providing Direct Patient Care, Washington State: 2019 and 2020

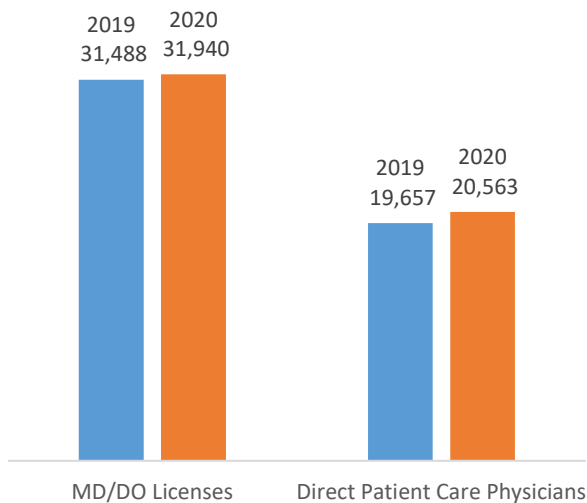
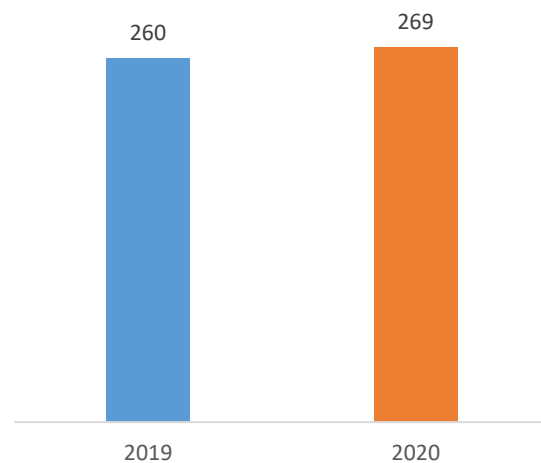


Figure 2. Total Practicing Physicians per 100,000 Population, Washington State: 2019 and 2020



## Physician Supply by Specialty

All categories of specialties described in this report had an increase of physicians except for the OB/Gyn and Pediatrics (General) which had a loss of 6 and 10 physicians, respectively. The "Other Specialty" category which includes all specialties not listed in specialty categories had the largest number of physicians (5,600 or 27.2%) in 2020. It is followed by Family Medicine/General Practice (3,533 or 17.2%) and Internal Medicine (General) (2,410 or 11.7%). In the remaining categories, the number of physicians ranged from 600 to 1,500 (or 3% to 7%). The rank order of these specialty categories remained largely the same in 2020 as in 2019. The hospitalist specialty was the only one with a change in the rank order. With its increase from 569 (2.9%) to 632 (3.1%) of physicians, it moved up from the smallest group to third smallest group. (Figure 3)

While the addition of over 900 physicians represents a 4.5% increase of the total physician supply, five specialty categories had a change that exceeds the state average. These five categories are: hospitalist (13.7%), Orthopedic Surgery (8.1%), Family Medicine/General Practice (7.9%), Emergency Medicine

<sup>2</sup> The DOH physician licenses include those issued for MDs and DOs.



(7.1%) and Anesthesiology (4.9%). As mentioned earlier, OB/Gyn and Pediatrics (General) were the only two categories that had a loss. However, the loss was small in terms of percent change, at 0.5% and 1%, respectively. (Table 1)

Figure 3. Number, Percent and Rate (per 100,000) of Physicians by Specialty, Washington: 2019 and 2020  
(sorted by 2020 numbers)

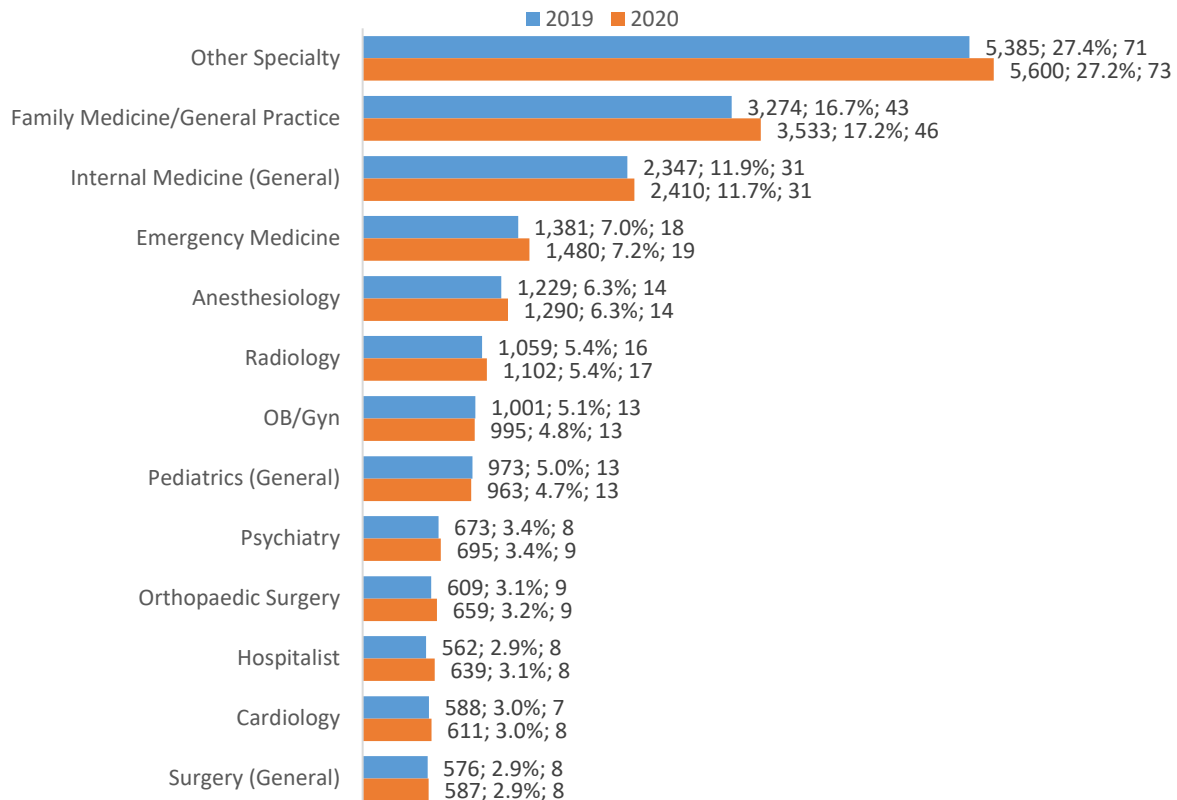


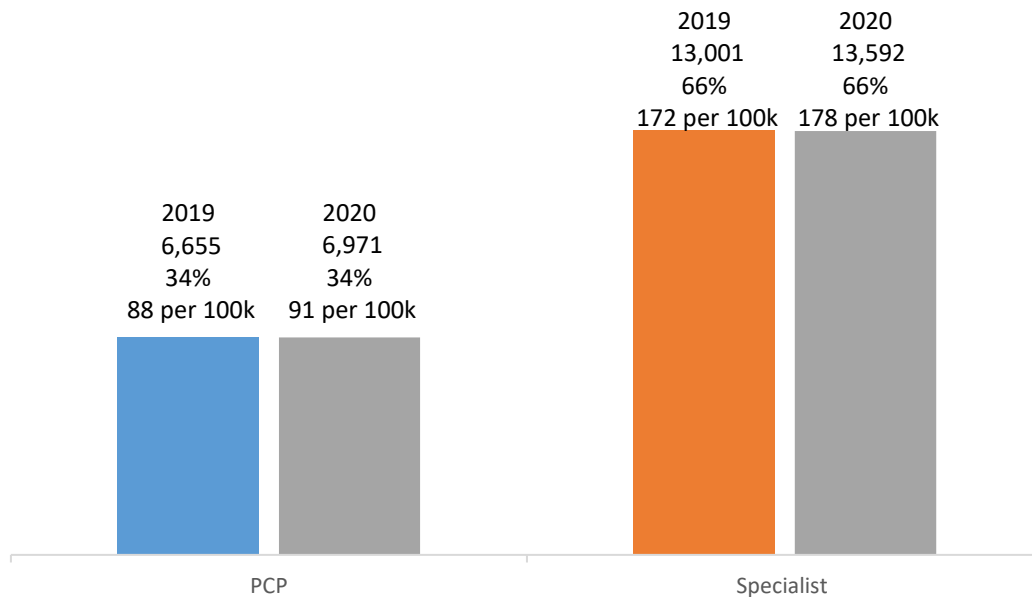
Table 1. Physician Supply Changes from 2019 to 2020 by Specialty: Washington

Primary Specialty	2019	2020	Change (N)	Change (%)
Other Specialty	5,385	5,600	215	4.0%
Family Medicine/General Practice	3,274	3,533	259	7.9%
Internal Medicine (General)	2,347	2,410	63	2.7%
Emergency Medicine	1,381	1,480	99	7.1%
Radiology	1,059	1,102	43	4.1%
Anesthesiology	1,229	1,290	61	4.9%
OB/Gyn	1,001	995	-5	-0.5%
Pediatrics (General)	973	963	-10	-1.0%
Orthopedic Surgery	609	659	49	8.1%
Psychiatry	673	695	22	3.2%
Cardiology	588	611	23	3.9%
Surgery (General)	576	587	11	1.9%
Hospitalist	562	639	77	13.7%
Total	19,657	20,563	907	4.6%

## Supplies of Primary Care Physicians and Specialists

Supplies of both primary care physicians and specialists increased in 2020. The PCP group had an increase of 316 physicians and the specialist group 591 physicians. The increases in both PCP and specialist groups were proportionate to their shares in 2019, thus their shares in 2020 remained the same – 34% (or 6,971) of PCPs and 64% (or 13,592) of specialists. The growth in both groups also exceeded the general population's growth and it resulted in an increase of PCPs from 88 to 91 per 100,000 population and an increase in specialists from 172 to 178 per 100,000 population.

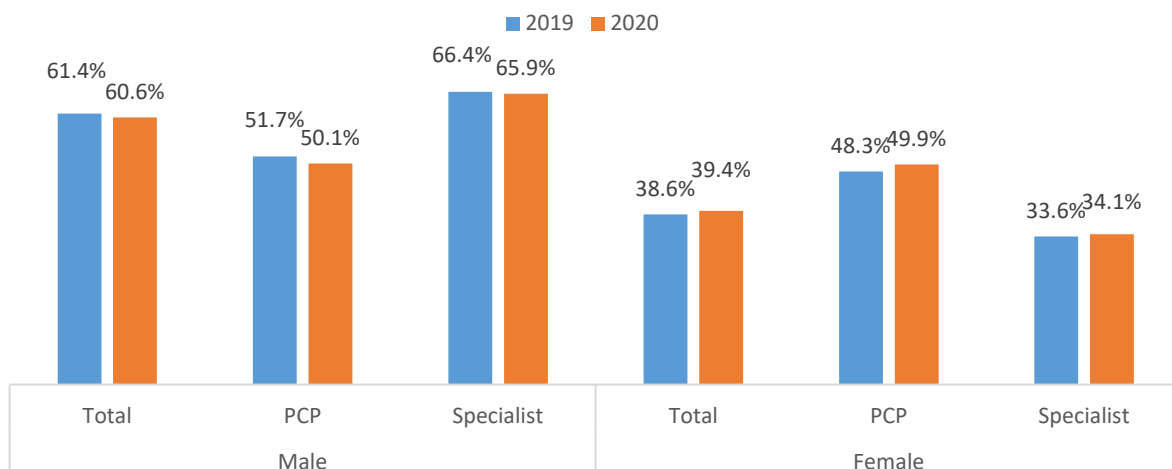
Figure 4. Year, Number, Percent and Rate (per 100,000) of PCPs and Specialists, Washington: 2019 and 2020



## Physician Demographics

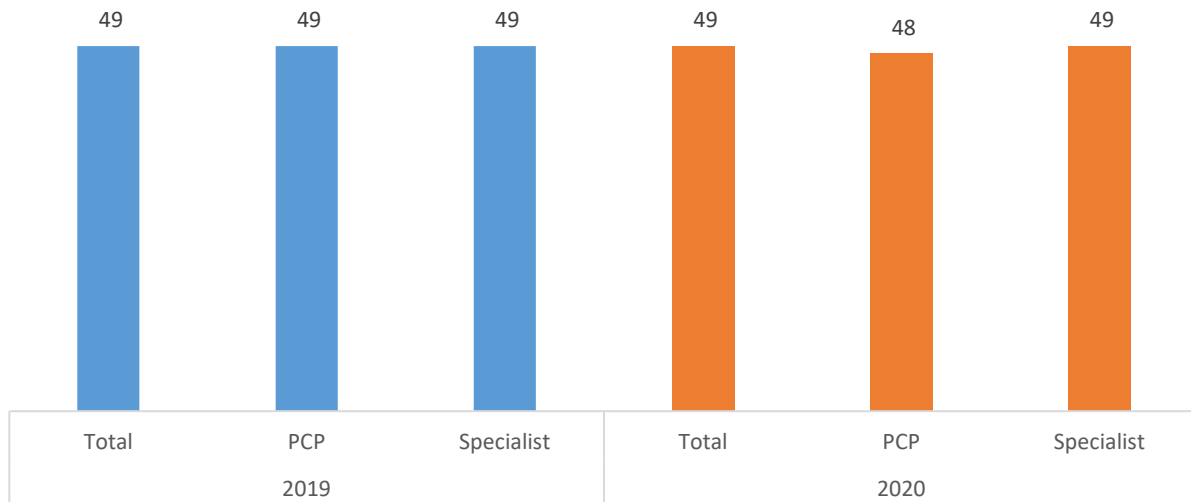
**Gender.** The share of female physicians continued to increase in 2020. In overall physicians, their share increased from 38.6% in 2019 to 39.4%. In both the PCP and the specialist groups, the share of female physicians went up; however, PCP group had a larger increase. In the PCP group, female physicians now account for 49.9%, an increase of 1.6 percentage points from the previous year. In the specialist group, their share increased from 33.6% to 34.1%, a gain of 0.5 percentage point.

Figure 5. Gender of Total Physicians, PCPs and Specialists (%), Washington: 2019 and 2020



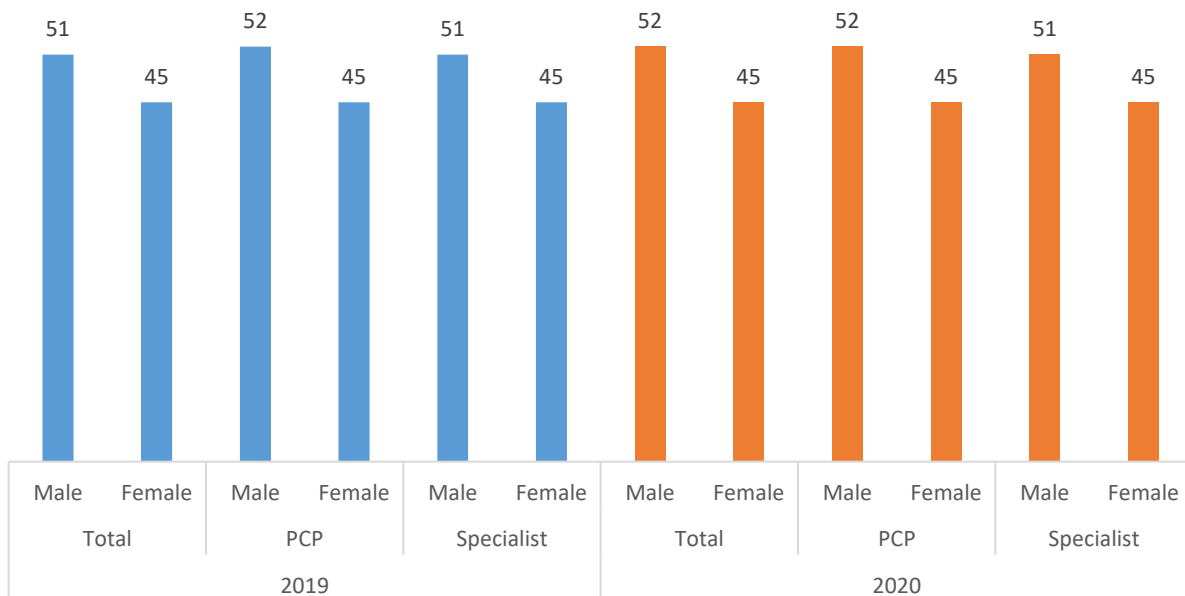
*Median age.* The median age of Washington's physicians remained at 49 years. The median age of specialists also remained the same at 49 years while the median age of PCPs dropped by one year from 49 years in 2019 to 48 years in 2020. (Figure 6)

Figure 6. Median Age of Total Physicians, PCPs and Specialists: 2019 and 2020



*Median age of male and female physicians.* Female physicians have a lower median age than male physicians by about six years. The median age of female physicians was 45 in both years regardless of their PCP/specialist status. For male physicians, their median age of 51 did not change for total male physicians and among male specialists. However, the median age of male PCPs increased from 51 to 52. (Figure 7)

Figure 7. Median Age of Total Physicians, PCPs and Specialists by Gender, Washington: 2019 and 2020

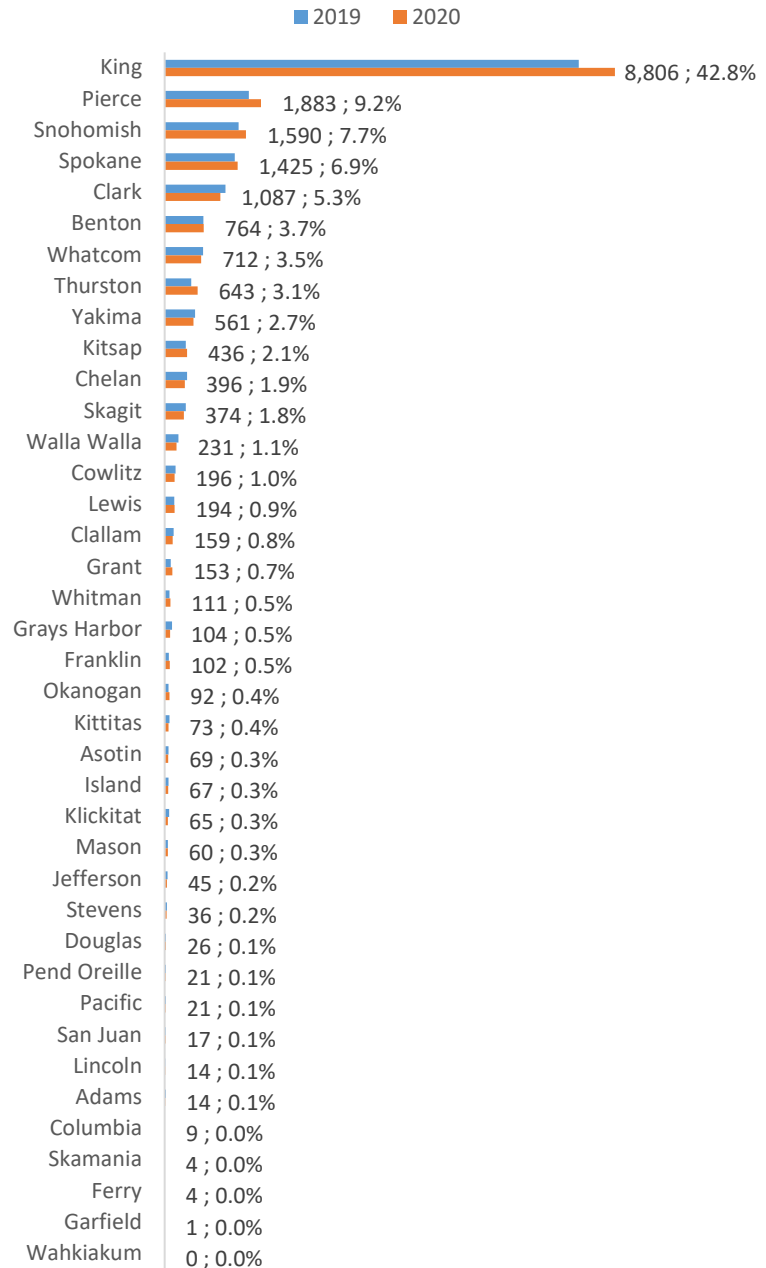


## County Distribution of Physicians

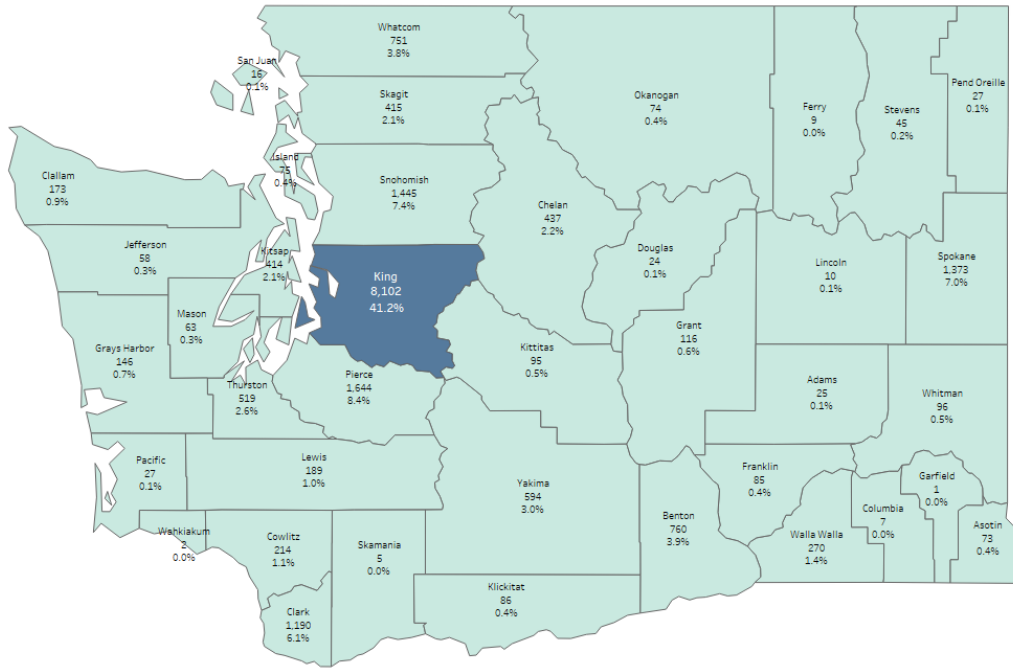
While the state's total physician supply increased from 2019 to 2020, the growth was not spread to all counties. In fact, in more than half of the counties (22), the number of physicians actually decreased. Among the four most populous counties (King, Pierce, Snohomish and Spokane), all had an increase. Their combined increase was 1,140 (9.1%). That means the decrease occurred among the remaining counties, which had a net loss of 233 (3.3%).

With a few minor differences, the rank order of county shares of the state's total physician supply in 2020 remained about the same as in 2019. King County continued to have the largest share at 42.8% or 8,806 in 2020 (increased from 41.2% or 8,102 in 2019). The next three most populous counties each had a share from 9.2% to 6.9%, with a combined share of 23.8%, an increase as well from 22.7% in 2019. The remaining 35 counties had a combined share of 33.4% (decreased from 36.1% in 2019), with nine of them each having a share between 3.7% and 1% and the other 26 counties each having less than 1%. (Figure 8)

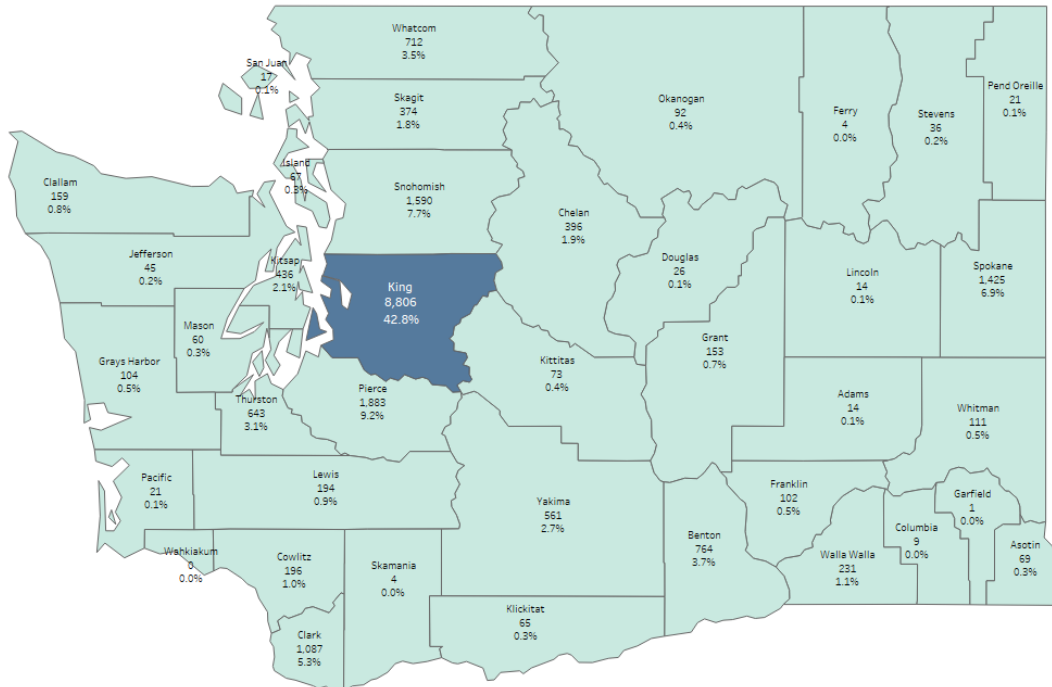
Figure 8. Number and Percent of Physicians by County in 2019 and 2020 (numbers shown for 2020 only)



Map 1. Number and Percent of Physicians: Counties 2019



Map 2. Number and Percent of Physicians: Counties 2020

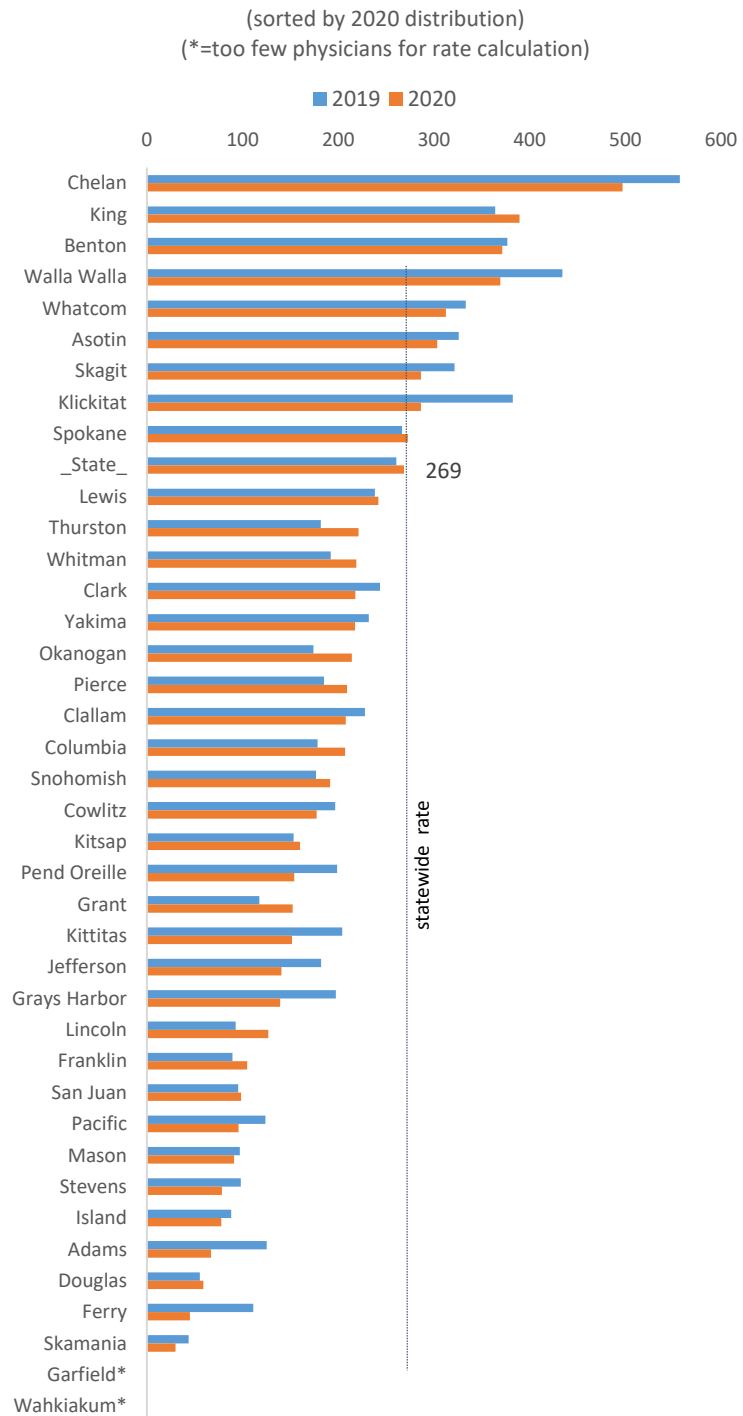


While the most populous counties had the largest shares of the state’s physician supply, the county level physician rates (physicians per 100,000 population) did not necessarily correspond to that distribution. In both 2019 and 2020, the same nine counties had a physician rate that was above the state’s rate, 260 physicians in 2019 and 269 physicians in 2020 per 100,000 population. Only one of the four most populous counties, King, was among the nine.

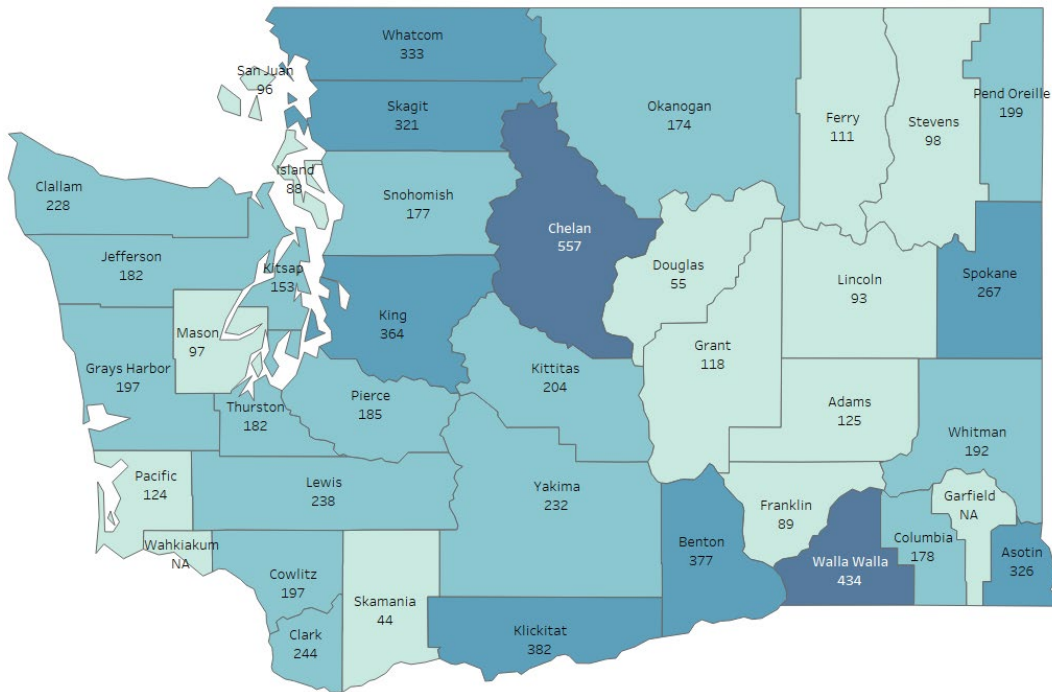
Chelan County had the highest rate in both years, although its rate decreased from 557 to 498 physicians per 100,000 population. Skamania County’s rate was the lowest in both years, also undergoing a decrease, from 44 physicians in 2019 to 30 physicians in 2020.

The large gap in physician rates between the highest and the lowest counties means physician availability in Chelan County was more than 16 times as large as that in Skamania County in 2020. However, Skamania borders with Oregon and some of the county’s residents may seek health services across the border. Availability of physicians in Oregon is not considered in this analysis, and thus the actual physician availability to the Skamania’s residents could be higher. (Figure 9)

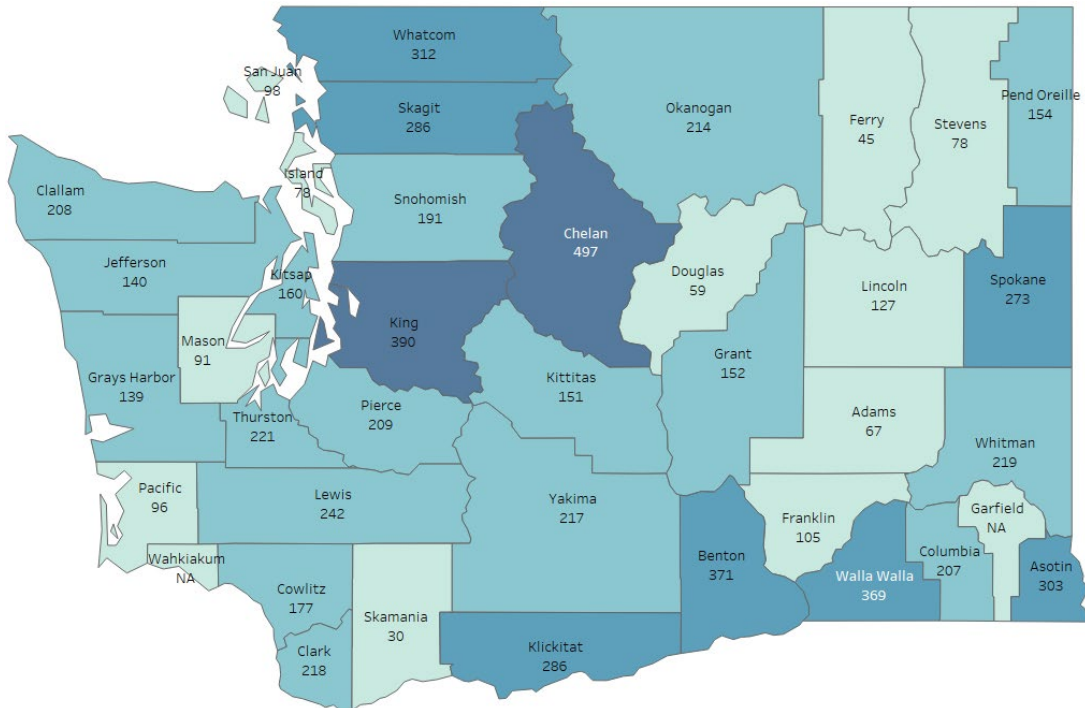
Figure 9. Number Physicians per 100,000 Population by County: 2019 and 2020



Map 3. Number of Physicians per 100,000 Population: Counties, 2019



Map 4. Number of Physicians per 100,000 Population: Counties, 2020



More data on county-level physician supplies including physician demographics and specialty details are published in a separate report on OFM’s Health Care webpage.

## ACH Distribution of Physicians

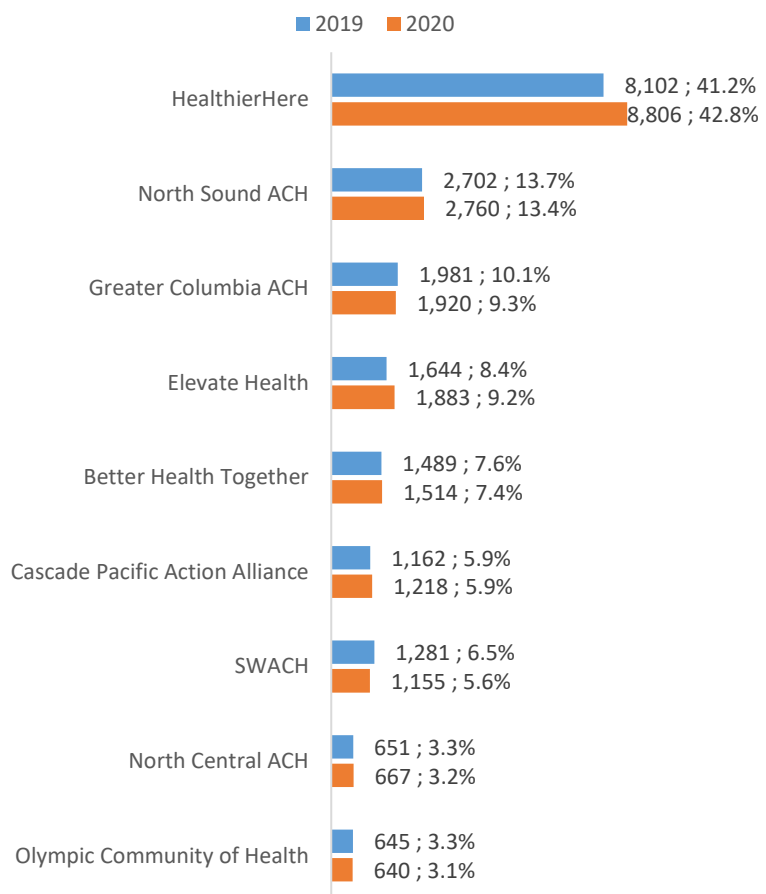
An Accountable Community of Health or ACH is a regional coalition consisting of representatives from a variety of sectors, working together to improve population health. Each ACH represents a county or a group of adjacent counties. The nine ACHs, with the counties in each, are:<sup>3</sup>

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. Elevate Health (Pierce)
4. Greater Columbia ACH (Asotin, Benton, Columbia, Garfield, Franklin, Kittitas, Walla Walla, Whitman and Yakima)
5. HealthierHere (King)
6. North Central ACH (Chelan, Douglas, Grant and Okanogan)
7. North Sound ACH (Island, San Juan, Skagit, Snohomish and Whatcom)
8. Olympic ACH (Clallam, Jefferson and Kitsap)
9. SWACH (Southwest Washington ACH) (Clark, Klickitat and Skamania)

Shares of the state's total physicians increased in two of the nine ACHs from 2019 to 2020, the two one-county ACHs - HealthierHere (King) and Elevate Health (Pierce). HealthierHere's share increased by 1.6 percentage points from 41.2% to 42.8%. Elevate Health's share increased by about half a percentage point from 8.4% to 9.2%. The other ACHs either had no change or had a decrease up to one percentage point.

The rank order of the ACH shares in 2020 was the same as in 2019 except that Cascade Pacific Action Alliance's share moved up past that of SWATCH to become the sixth largest. HealthierHere had the largest share (42.8% or 8,806) of all ACHs. North Sound ACH had the distant second largest share, 13.4% or 2,760 (a decrease from 13.7% or 2,702 in 2019). North Central ACH and Olympic Community of Health had the lowest shares at 3% with approximately 650 physicians each.

Figure 10. Number and Percent of Physicians by ACH, 2019 and 2020

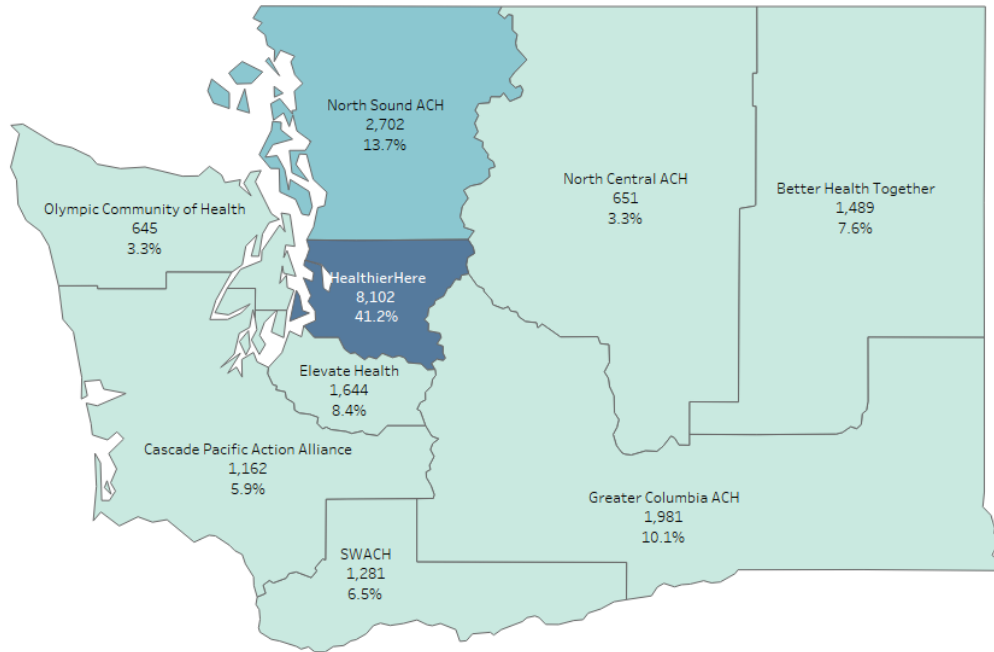


<sup>3</sup> See <https://www.hca.wa.gov/assets/program/achfactsheet.pdf>.

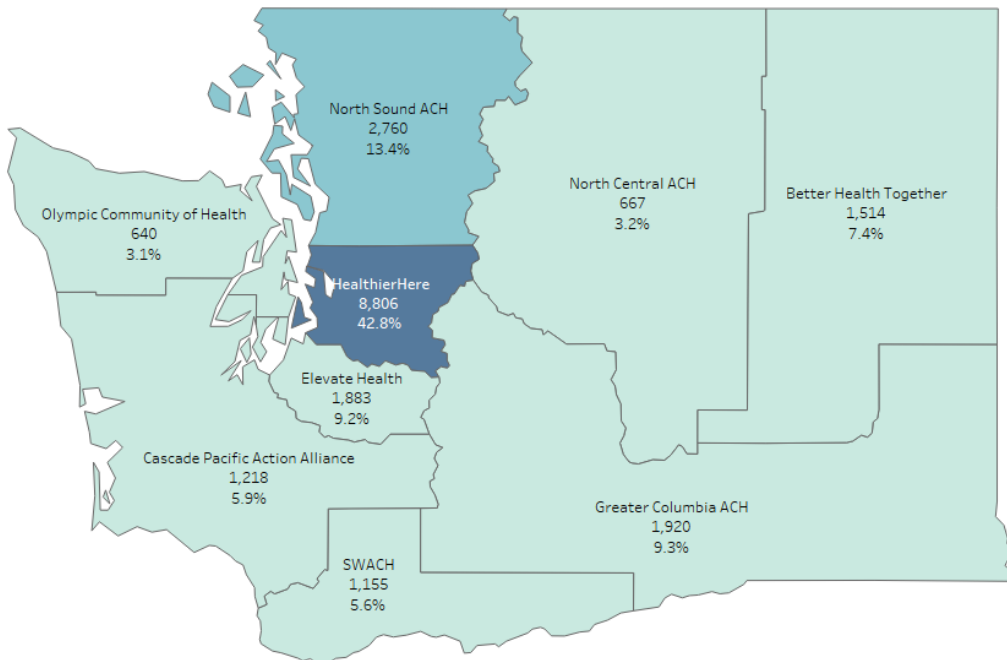


The remaining ACHs each had 5-10% (1,200-2,000 physicians). (Figure 10)

Map 5. Number and Percent of Physicians: ACH Regions, 2019

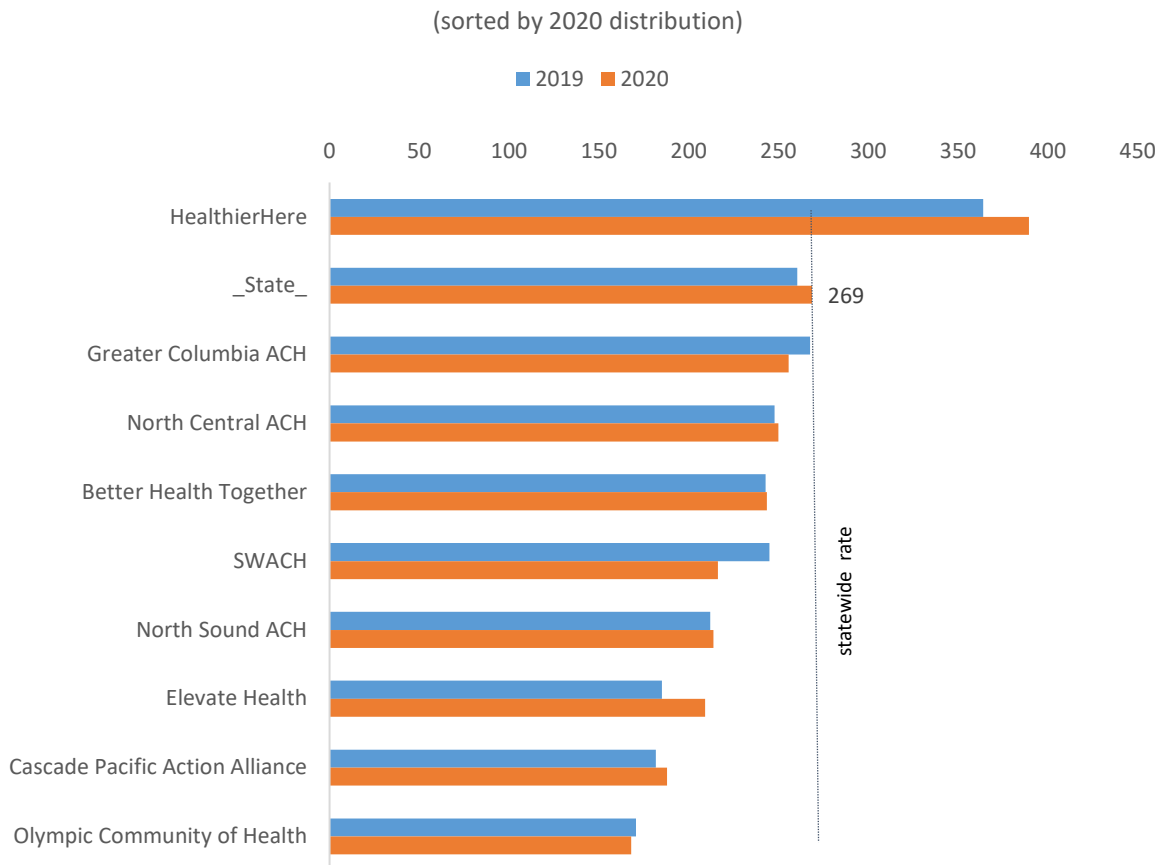


Map 6. Number and Percent of Physicians: ACH Regions, 2020

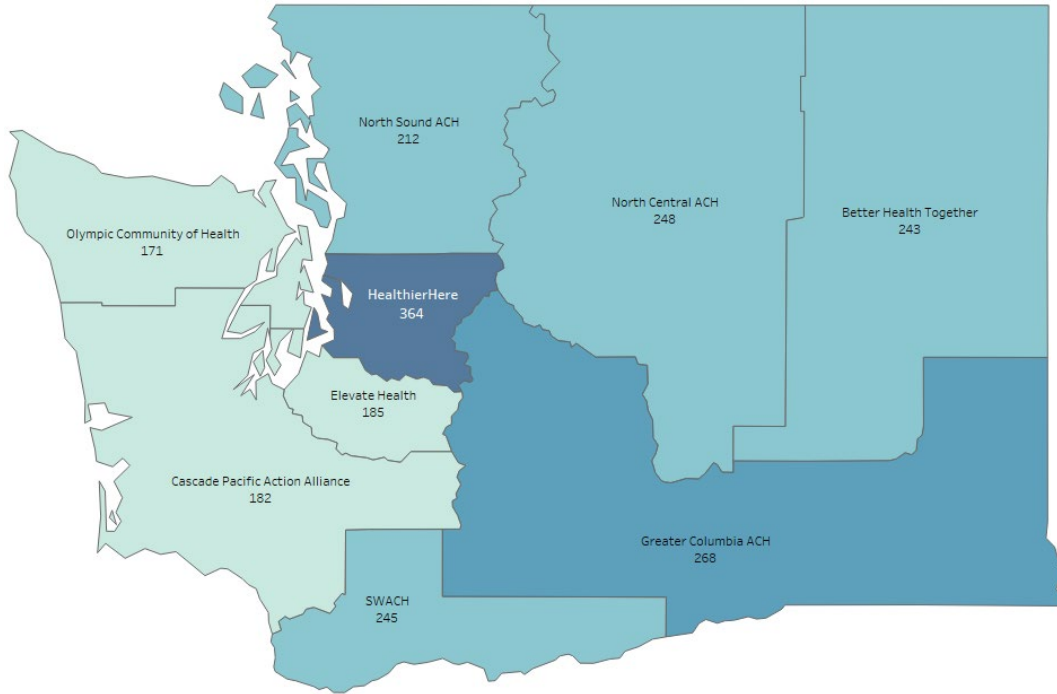


Not only did HealthierHere lead in shares of physicians, it also led in physician rates. Its lead in physician rate increased from 364 physicians in 2019 to 390 physicians in 2020 per 100,000 population. HealthierHere was the only ACH in 2020 and one of two ACHs in 2019 with a physician rate higher than the statewide rate. Greater Columbia ACH had the second highest physician rate in both years, but its decrease from 268 to 256 physicians per 100,000 population changed its rate from being above the statewide rate to below. The Olympic Community of Health had the lowest physician rate in both years, with a slight decrease. Its rate of 168 in 2020 was less than half of the HealthierHere’s rate. (Figure 11)

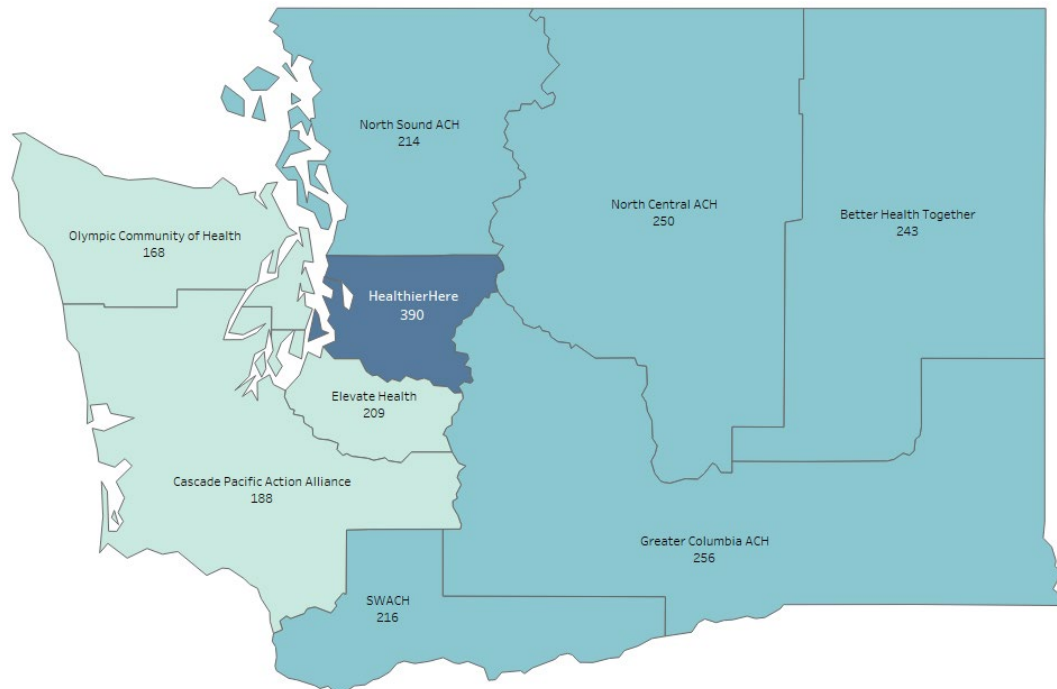
Figure 11. Number of Physicians per 100,000 Population by ACH: 2019 and 2020



Map 7. Number of Physicians per 100,000 Population: ACH Regions, 2019



Map 8. Number of Physicians per 100,000 Population: ACH Regions, 2020



More data on ACH-level physician supplies including physician demographics and specialty details are published in a separate report on OFM's Health Care webpage.

## 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 insurer 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). Starting in 2017, Washington state's NARs discontinued the previous provider specialty categories and replaced them with Health Care Provider Taxonomy Codes Set issued by the National Uniform Claim Committee. 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 to an individual or organizational provider in the U.S. Part of the NPI database is publicly available. The public information for 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 licensing, providers must renew their licenses at certain intervals depending on the professions. For physicians, renewal is every two years. The provider license database includes information on the provider's name, age, sex, credential type, license start date, most recent renewal 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 June Network Access Reports for 2019 and 2020*

The NARs for June 2018 and June 2019 were downloaded from OIC's website. Once all insurance companies' reports were collected, the reports were combined by year and each year's data were processed separately. The NARs are structured in such a way that there are five blocks of rows of data and, depending on the block, the column name and purpose may be different. For example, a column in the block for individual provider information may be the individual NPI number, but in the block for organization contract information it may be the organization NPI number. Therefore, the next step was to "rectangularize" the data records by transforming the blocks of data rows into blocks of data columns so that each row is a record for an individual provider. The final step was to remove non-physician records and retain only physician records.

#### *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. Only records that matched on NPI between the two files were retained.

Next, the matched NAR-NPI records were matched with the DOH license database on the physician credential number. In this step, only matched records with non-expired licenses as of June of the selected year were retained.

*c. Recode of provider taxonomies and assignment of primary specialty*

The number of provider taxonomies in the NARs was too large for meaningful analyses. To reduce the number for reporting, a crosswalk file was constructed that converts provider taxonomy into 13 provider specialty groups. The crosswalk was then applied to the NAR file to create the primary specialty field. A physician's primary specialty was determined by the first taxonomy code linked to that physician at a practice location. If different insurance companies had different first taxonomy codes for this physician at that particular location, the physician was assigned multiple primary specialties. The physician was also assigned multiple primary specialties if the physician had multiple practice locations and had different first taxonomies associated with those locations. The 13 specialty groups adopted for this report are as follows:

1. Anesthesiology
2. Cardiology
3. Emergency Medicine
4. Family Medicine/General Practice
5. Hospitalist
6. Internal Medicine (General)
7. OB/GYN
8. Orthopedic Surgery
9. Pediatrics (General)
10. Psychiatry
11. Radiology
12. Surgery (General)
13. Other Specialty

*d. Final record selection*

Because the NAR files contain physician records reported by all insurance carriers and each carrier's report may contain physician records for multiple plans, there are numerous duplicate records due to cross-carrier reporting and/or cross-plan reporting within a carrier's report. In the final record selection process, only one record was retained from the data field combination of NPI, primary specialty, practice geo-coordinates and practice name. In addition, a small number of records that had missing data on the state of the practice location, physician's last name or NPI were excluded from the final selection.

*d. 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 primary specialty. We then summed up the populations of the associated ZIP Codes.<sup>4</sup> Then each ZIP Code's fraction of the total population from all associated ZIP Codes was calculated. These fractions were used to distribute 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 (general), was 0.5. Further, suppose this specialty of the physician was associated with three ZIP Codes that accounted for 70%, 20% and 10% of the total population of the three ZIP Codes combined. The ZIP Code with 70% of the population would receive 70% of the initial weight for the primary specialty, thus, 0.35 (i.e.,  $0.5 \times 70\%$ ), the 20% ZIP Code would receive a weight of 0.1 and the 10-percent ZIP would receive a weight of 0.05.

In some cases, 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 (general) specialty was associated with three locations in the 70% ZIP Code area. Then the final weight for each location record for this ZIP Code associated with this physician's internal medicine (general) specialty would be 0.1167 ( $0.35/3$ ).

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% ZIP Code is associated with two counties and County A's population fraction of the ZIP Code's total population is 70% and County B's fraction is 30%. Then the ZIP Code-level physician record weight of 0.1 is redistributed into 0.07 ( $0.1 \times 0.7$ ) to County A and 0.03 ( $0.1 \times 0.3$ ) 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 sum to 1 and the sum of weights of all physicians should equal the unique count of physicians without weights. The county-level weights can be used for analyses for counties, regions consisting of counties and the state.

#### *e. 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% full time equivalency (FTE). The physician's "FTE"

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<sup>4</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.

is 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. Therefore, one physician FTE in 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.

Primary specialty: A primary specialty is the first provider taxonomy code of a physician listed under a health insurance carrier's plan for a practice location in the NAR.

PCP/Specialist physicians: A PCP is a physician who provides primary care. Primary care, in general, refers to "the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community."<sup>5</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 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, geriatric medicine, internal medicine (general) and pediatrics (general).

Physician rate: A physician rate is calculated as the number of 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).

#### *f. 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 promptly remove records from NARs for providers who no longer practice in Washington (due to retirement or moving to another state, for example), although they maintain 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 practicing in Washington, though, it is impossible to quantify these two errors precisely and their overall effect on physician supply estimates. 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

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<sup>5</sup> Donaldson MS, Yordy KD, Lohr KN, Vanselow NA, Editors. Primary Care: America's Health in a New Era. Committee on the Future of Primary Care, Division of Health Care Services. Institute of Medicine. National Academy Press. Washington, D.C. 1996: p. 31.

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 of 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 of the ZIP Code area's total population. These ZIP Code-level and county-level weighting techniques no doubt improves 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 providing 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. Therefore, the actual physician supply would be larger than estimated in this report if physicians in neighboring states serving Washington residents had been included.