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**WWAMI
Physician Workforce
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by

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ABOUT THE WORKFORCE CENTER

The WWAMI Center for Health Workforce Studies at the University of Washington Department of Family Medicine is one of six regional centers funded by the National Center for Health Workforce Analysis (NCHWA) of the federal Bureau of Health Professions (BHP), Health Resources and Services Administration (HRSA). Major goals are to conduct high-quality health workforce research in collaboration with the BHP and state agencies in Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI); to provide methodological expertise to local, state, regional, and national policy makers; to build an accessible knowledge base on workforce methodology, issues, and findings; and to provide wide dissemination of project results in easily understood and practical form to facilitate appropriate state and federal workforce policies.

The Center brings together researchers from medicine, nursing, dentistry, public health, the allied health professions, pharmacy, and social work to perform applied research on the distribution, supply, and requirements of health care providers, with emphasis on state workforce issues in underserved rural and urban areas of the WWAMI region. Workforce issues related to provider and patient diversity, provider clinical care and competence, and the cost and effectiveness of practice in the rapidly changing managed care environment are emphasized.

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INTRODUCTION

The University of Washington School of Medicine (UWSOM) currently produces approximately 175 physicians a year and hosts over 30 graduate medical education programs. As the only medical school for the five-state WWAMI region, the UWSOM has embraced its mission to train physicians for the Northwest, with a particular commitment to primary care. Over the past 30 years, over 60 percent of graduating students stay within the five-state area to practice.

The emphasis on primary care remains important because over one-third of the WWAMI population lives in rural areas and tends to be medically underserved. Over the past two decades, almost 50 percent of graduating students have chosen to pursue careers in primary care. Upon graduation, an estimated 20 percent of WWAMI graduates will practice in federally-designated Health Professional Shortage Areas.

Data on physician supply, demand, and need in the WWAMI region have not been routinely collected or reported. This report responds to a request by the UWSOM Primary Care Steering Committee to examine the current supply and distribution of physicians in the WWAMI region. These data can help inform and guide the UWSOM in the production of physicians for the WWAMI region. The analysis utilizes the 2005 AMA Masterfile to determine the population-based supply of physicians at the state and county level, analyzed by the discipline of physician, and whether they had graduated from, or trained at the University of Washington. These data will enable the School of Medicine to tailor its admissions and training processes to meet regional demands.

METHODS

For this analysis, we identified clinically-active allopathic physicians in the WWAMI five-state region using the 2005 AMA Masterfile. The AMA Masterfile is a complete registry of every physician in the United States, and is not determined by membership in the AMA. It is regularly updated by physician survey as well as by data from medical schools, state licensing agencies, the NBME, and other organizations. Physicians are asked to identify their major professional activity. We excluded physicians who were inactive or who identified administration, teaching, or research as their major activities. Resident physicians were excluded in the analysis.

Physician discipline was determined by the physician's designated primary discipline. Similar disciplines were combined, although we focused on the disciplines with training programs at the UWSOM. We also identified the medical school from which the physician graduated, with a special emphasis on graduates from the UWSOM. Similarly, we examined physicians' residency training history, with an emphasis on physicians who trained at UW graduate medical education programs as well as the WWAMI family medicine residency network. The AMA Masterfile records data for up to six different residencies per physicians. We identified physicians who participated in a UW residency program at any time during their training.

Physicians' locations were determined by reported ZIP code and reflected the physician's primary practice location. The ZIP codes were then mapped to Rural-Urban Commuting Area (RUCA) and county designations. RUCA codes identify areas as urban, large rural, small rural, or isolated small rural, and are based on a combination of geographic location and commuting times to urban locations. The RUCA system is a ten-tiered classification system based on census tract geography. Both population size and commuting relationships are used to classify census tracts. First, urbanized (continuously built up areas of 50,000 or more), large town (10,000-49,999), and small town (2,500 to 9,999) cores areas are identified. Next, the primary (largest) and secondary (second

largest) commuting flows of remaining tracts are examined using the most recently available commuting data. High commuting tracts are those where the primary or largest commuting flow is greater than 30 percent to a core area. Low commuting or influence area tracts are those where the largest flow to core areas is 5-30 percent.

Using the county designations, we used Claritas data to determine the estimated 2004 population for each county in the WWAMI region. We then calculated the number of physicians per capita who worked in each county. In order to compare physician supply between counties, we calculated the mean number of physicians per capita for the entire nation and used it as a comparator for individual county rates.

RESULTS

There are currently 22,578 physicians in the five-state WWAMI region. Of these, there are 18,794 clinically-active physicians, including locum tenens, office- and hospital-based physicians. Two-thirds of these physicians (12,718) are in Washington state. Wyoming has the smallest number of physicians (830), accounting for 4.4 percent of WWAMI physicians. At the county level, the majority of all counties (87%) had at least one physician.

Several of these analyses focus upon five medical specialties: family medicine, general internal medicine, general pediatrics, obstetrics-gynecology, and general surgery. Data for all disciplines are available in the appendices. See Table 1.

PHYSICIAN:POPULATION RATIOS

The ratios of physicians/population in the WWAMI states and in the US as a whole are compared in Table 2.

Appendix A shows the physician/population ratio for the WWAMI states for all disciplines. Figure 1 demonstrates the total physician: population ratio for all states in the nation. Whether it is useful to compare the WWAMI state ratios to the national average is open to debate. Some have argued that the WWAMI has a particular culture that emphasizes family medicine. Others note the lack of information about

physician distribution (e.g., rural-urban, underserved) in national means. Clearly, the mix of rural and urban environments influences the specialty mix of physicians in each state. Appendix B shows the proportion of physicians by disciplines in each WWAMI state. Appendix C also contains tables and maps of the physician to population ratio for each county in the WWAMI states.

PHYSICIAN DISTRIBUTION BY RUCAS

Examining the physician distribution by RUCA demonstrates differences that are not as easily seen by county-level analyses. Family physicians are more evenly distributed among the urban, rural, and isolated small rural areas in the WWAMI region than other disciplines. See Table 3.

The RUCA distribution for other disciplines in the WWAMI can be found in Appendix D.

PHYSICIAN DEMOGRAPHICS

On average, physicians in Alaska were younger than physicians in the other states (mean age 48.4 vs. 49.2). 30 percent of Wyoming physicians were over age 55, compared with 27 percent in the WWAMI. 26 percent of WWAMI physicians are women. Racial and ethnic data are not reliably recorded in the AMA Masterfile and are not included in this analysis. See Table 4.

Age analysis determined whether certain disciplines had higher proportions of older or younger physicians.

Table 1: WWAMI Physicians, by Discipline

Discipline	n	% of Total WWAMI Physicians (18,794)
Family Medicine	3,872	20.6
General Internal Medicine	2,111	11.2
Pediatrics	1,144	6.1
Obstetrics-Gynecology	1,026	5.5
Surgery	703	3.7

Table 2: Ratio of Physicians per 10,000 Population, by State and Discipline

	Washington	Wyoming	Alaska	Montana	Idaho	US
State population	6,182,560	502,975	654,052	922,057	1,383,295	
Family Medicine	3.98	3.98	5.17	4.25	3.48	2.49
General Internal Medicine	2.44	1.73	1.88	2.18	1.38	2.72
Pediatrics	1.34	.82	1.38	.92	.73	1.46
Obstetrics-Gynecology	1.09	.91	1.16	1.1	.93	1.17
Surgery	.65	.85	.98	.92	.77	.72
All disciplines	20.57	16.5	19.59	20.06	15.29	19.24

Figure 1: U.S. Physician:Population Ratios, 2005

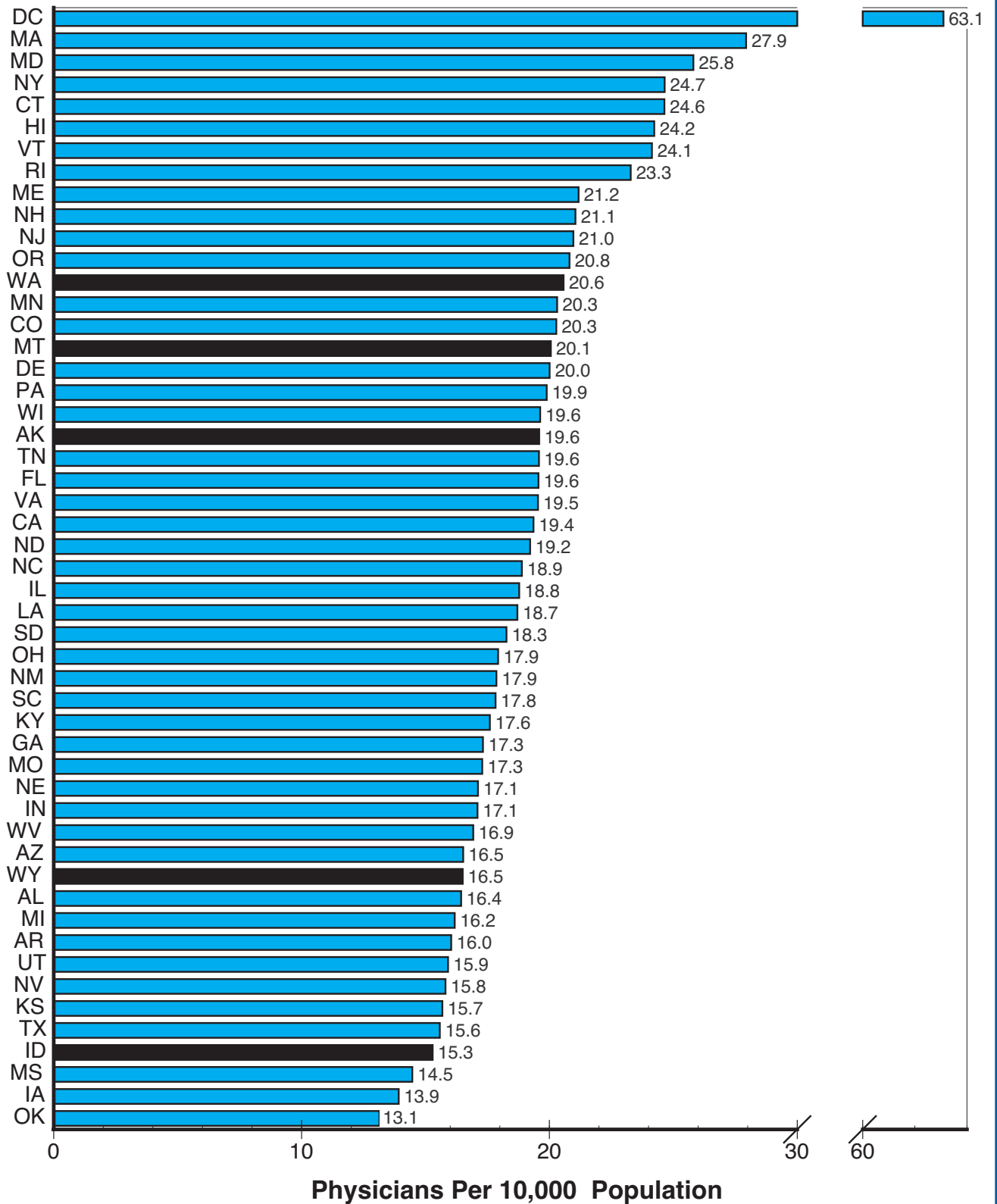


Table 3: Physicians per 10,000 by RUCA in the WWAMI Region

	Urban	Large Rural	Small Rural	Isolated
Family Medicine	3.99	4.28	5.35	3.89
Internal Medicine	2.59	2.24	1.46	.26
Pediatrics	1.45	1.11	.61	.21
Obstetrics-Gynecology	1.28	1.02	.68	.1
Surgery	.74	.85	1.12	.18

Table 4: Percentage of Physicians in Age and Gender Categories, by State

	Washington	Wyoming	Alaska	Montana	Idaho
< 40	28	21	25	18	22
40-55	48	51	50	54	52
> 55	24	28	26	29	27
% female	28	20	29	22	18

This analysis included residents and was combined for the WWAMI states. 29 percent of family physicians were less than 40 years old and 21 percent were over 55. Disciplines with the highest proportions of older physicians included allergy/immunology (49%), plastic surgery (39%), psychiatry (38%), urology (37%), and orthopedics (34%).

Age analysis by RUCA distribution demonstrates a linear relationship of increasing age with increasingly rural practice locations. The mean age of physicians in isolated small rural areas was 50.4, compared to 48.9 in urban areas (p<.001). See Table 5.

UWSOM GRADUATES

Overall, 14 percent of physicians in the WWAMI graduated from the University of Washington School of

Medicine. The second highest-producing school was Oregon Health Sciences University (3%).

WWAMI family physicians and general internists were more likely to have graduated from the UWSOM than other WWAMI physicians (FP 20.4% vs. 12.6%, p<.001; IM 16.1% vs. 14.0%, p<.001).

General surgeons, however, were less likely to have graduated from the UWSOM than other WWAMI physicians, (Surg 9.2% vs. 14.4%, p<.001).

In Washington State, 25 percent of family physicians graduated from the UWSOM, compared to only 15 percent of other physicians (p<.001). Family physicians in all but one of the WWAMI states were more likely to have graduated from

the UWSOM. See Table 6. It should be noted that Wyoming only recently joined the WWAMI in 1997.

17 percent of Washington state physicians graduated from the UWSOM. Nebraska has the highest proportion of in-state medical school graduates (62%). The states are compared in Figure 2.

Table 5: Percentage of WWAMI Physicians by RUCA and Age Categories

	Urban	Large Rural	Small Rural	Small Isolated	Total
< 40	79	13	6	2	3,610
40-55	78	14	6	2	10,032
> 55	75	16	7	3	5,145
Mean age	48.9	49.7	50.0	50.4	49.2

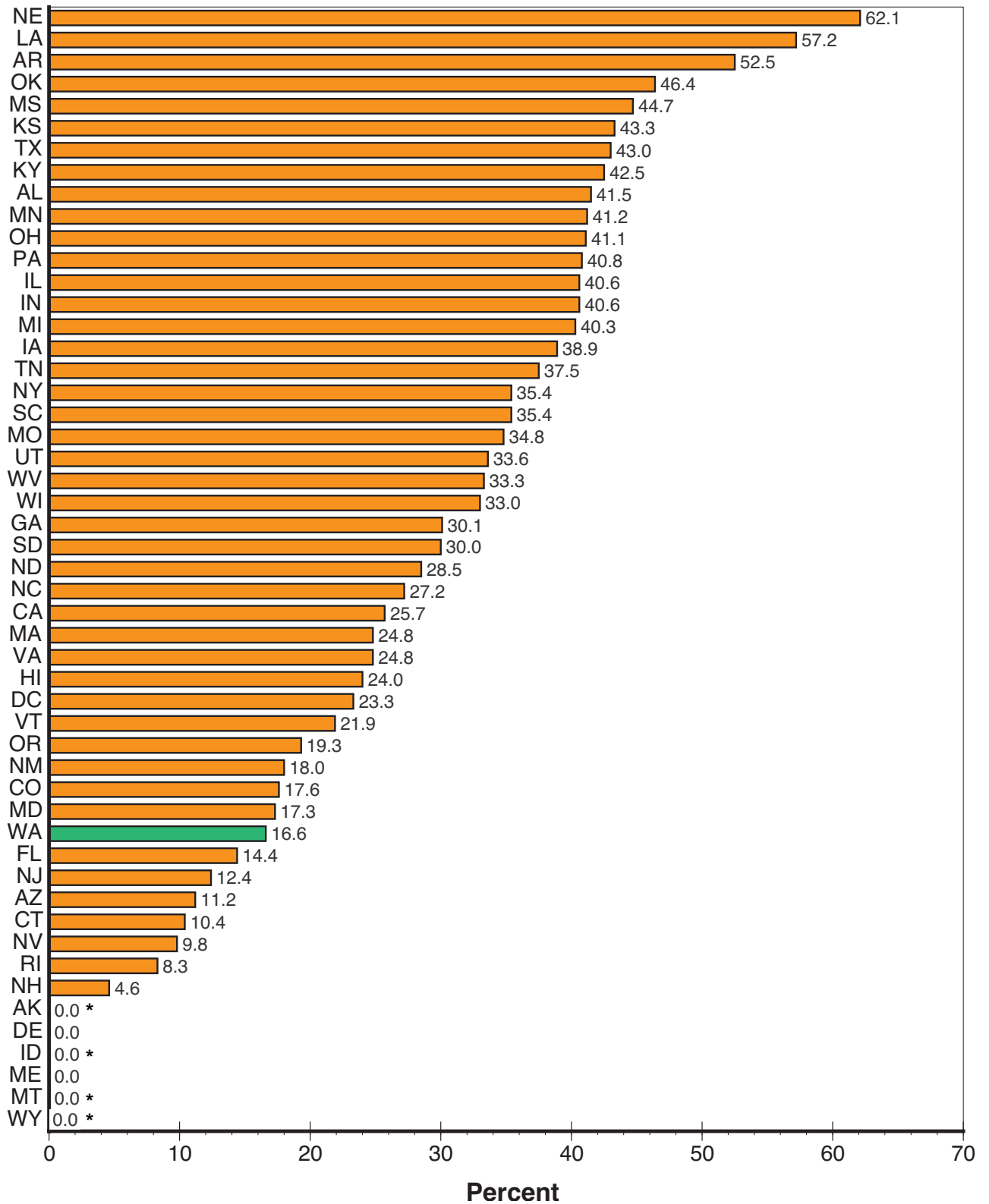
Data available for each state upon request.

Table 6: Percentage of Physicians Who Graduated from UWSOM, by State and Discipline

	Washington	Wyoming	Alaska	Montana	Idaho	WWAMI
Family Medicine	25*	1	14*	16*	15*	20
General Internal Medicine	18	0	10	15*	14	16
Pediatrics	14*	5	12	14	6	13
Obstetrics-Gynecology	15	0	13	9	9	13
Surgery	10*	2	8	11	8	9

* p<.05 compared to other physicians in state.

Figure 2: Percentage of State Physicians Who Attended Medical School within State, 2005



* These states participate in the University of Washington WWAMI program and fund in-state students for medical school training at the UWSOM. Although their percentage on this table is shown as zero, they do provide in-state training. Accounting for these students from these four states would not significantly change their positions on this figure.

UW RESIDENCY GRADUATES

The in-state proportion of UW residency graduates (including University of Washington Medical Center, Harborview Medical Center, and Children’s Hospital and Medical Center) was higher than that of the medical school alone. 22 percent of Washington state physicians trained at a UW residency. That proportion decreased for the other WWAMI states, to 6 percent of Alaska and Idaho physicians, 5 percent of Montana physicians, and only 1 percent of Wyoming physicians having trained at a UW residency program. Overall, 16 percent of all WWAMI physicians trained at a UW residency program. See Table 7.

We also examined the proportion of physicians who trained in any residency program in the state in which they are currently practicing. In Washington, 35 percent of physicians trained in a residency program in Washington state. New York state had the highest proportion of physicians who trained in an in-state residency program (82%), followed by Illinois (69%), Pennsylvania (66%), and California (64%). These results are strongly related to the number of residency programs in each state (Figure 3).

There is a higher percentage of physicians in each state who either graduated from a medical school in that state or trained at a residency program in that state (Figure 4). In Washington, 42 percent of physicians either graduated from the UWSOM or trained at a residency in Washington. 86 percent of New York physicians went to medical school or residency in state, followed by Michigan (76%), Illinois (76%), Louisiana (73%), and Pennsylvania and Ohio (72%). Among family physicians in the WWAMI, 40.1 percent either graduated from the UWSOM or trained at a UW or WWAMI network residency program. See Table 8.

DISCUSSION

This report examines the current physician workforce in the five-state WWAMI region. It is important to note that these results are a cumulative and retrospective consequence of the past several decades of physician production and distribution policies in the Pacific Northwest. In crafting new policies, these results will need to be considered within the context of current trends in the physician

workforce, including the declining interest and match rates in primary care, the increasing numbers of international medical graduates (IMGs) and women in medicine, and current market demands.^{1,2} Because these data are derived from the AMA Masterfile, with its recognized temporal lags, they do not reflect the most recent changes in student discipline choice and match rates at the UWSOM.³⁻⁵

Especially notable findings include the following:

- (1) Of all the physicians currently practicing in the WWAMI, 14 percent graduated from the UWSOM. 16 percent of WWAMI physicians trained in a UW residency program. The majority of WWAMI physicians who are either UWSOM or UW residency graduates practice in Washington state. Family physicians from the WWAMI family medicine residency network are more evenly distributed.
- (2) At the state level, the physician to population ratios are comparable to the rest of the nation, and are higher in family medicine. This latter finding likely demonstrates the region’s rural nature and primary care-oriented environment, rather than an over-supply of family physicians. The finding also confirms the past success of the UWSOM in attracting students and graduates into family medicine.
- (3) The RUCA distribution data are particularly informative, demonstrating that family physicians in the WWAMI states have distributed more uniformly among urban, rural, and remote areas than other physicians. While this is in part a basic function of community-based primary care

Table 7: Percentage of Physicians Who Trained in a UW Residency Program, by State and Discipline

	Washington	Wyoming	Alaska	Montana	Idaho
Family Medicine (WWAMI Res Network)	34	24	18	23	31
General Internal Medicine (includes Spokane)	23	1	7	11	20
Pediatrics	28	2	9	5	9
Obstetrics-Gynecology	15	0	7	2	5
Surgery	14	2	3	1	9

Table 8: Percentage of Family Physicians Who Graduated from UWSOM or Trained in a UW Residency Program, by State and Discipline

	Washington	Wyoming	Alaska	Montana	Idaho
Family Medicine (WWAMI network)	45	25	28	31	37

Figure 3: Percentage of State Physicians Who Were in a Residency within State, 2005

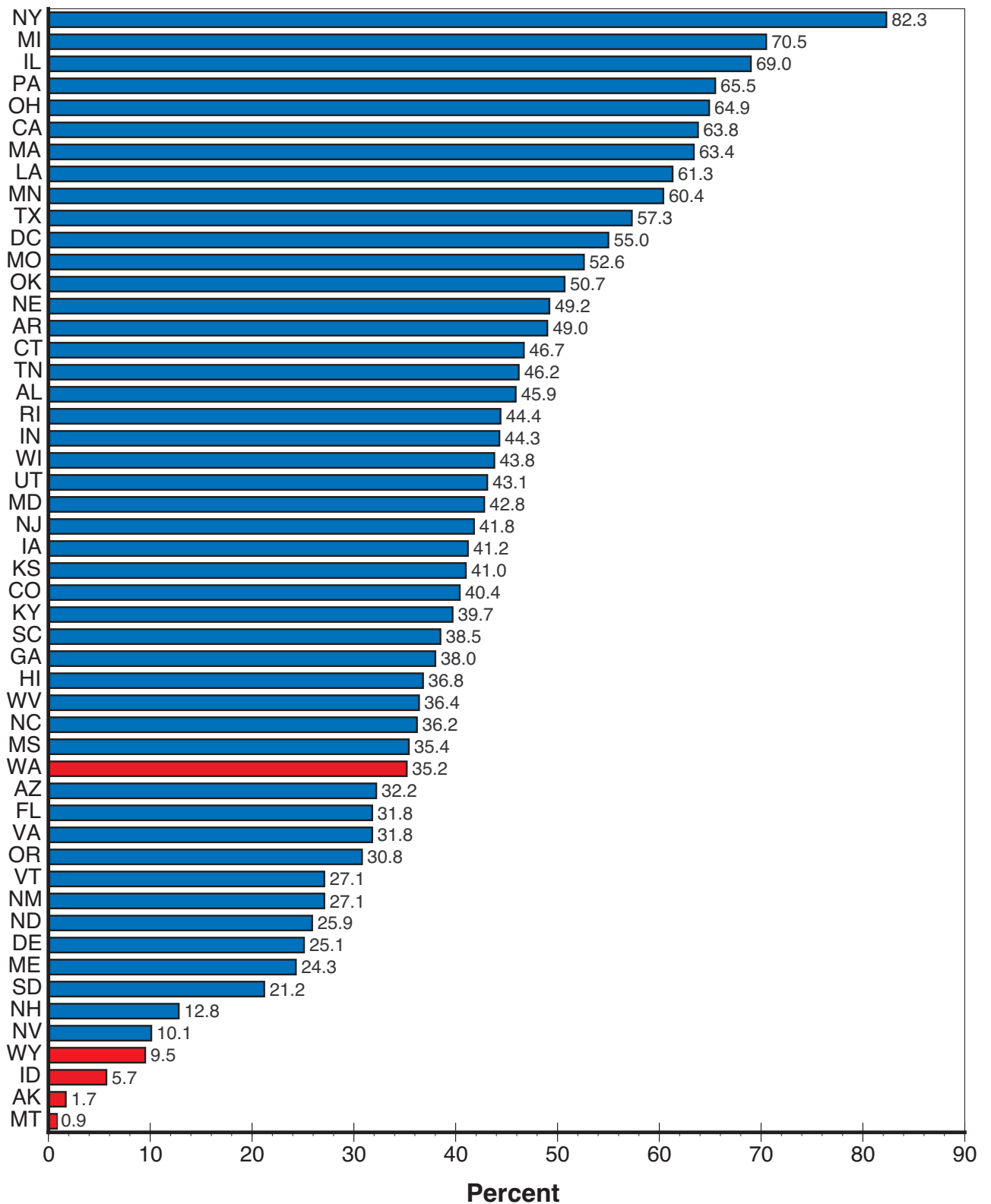
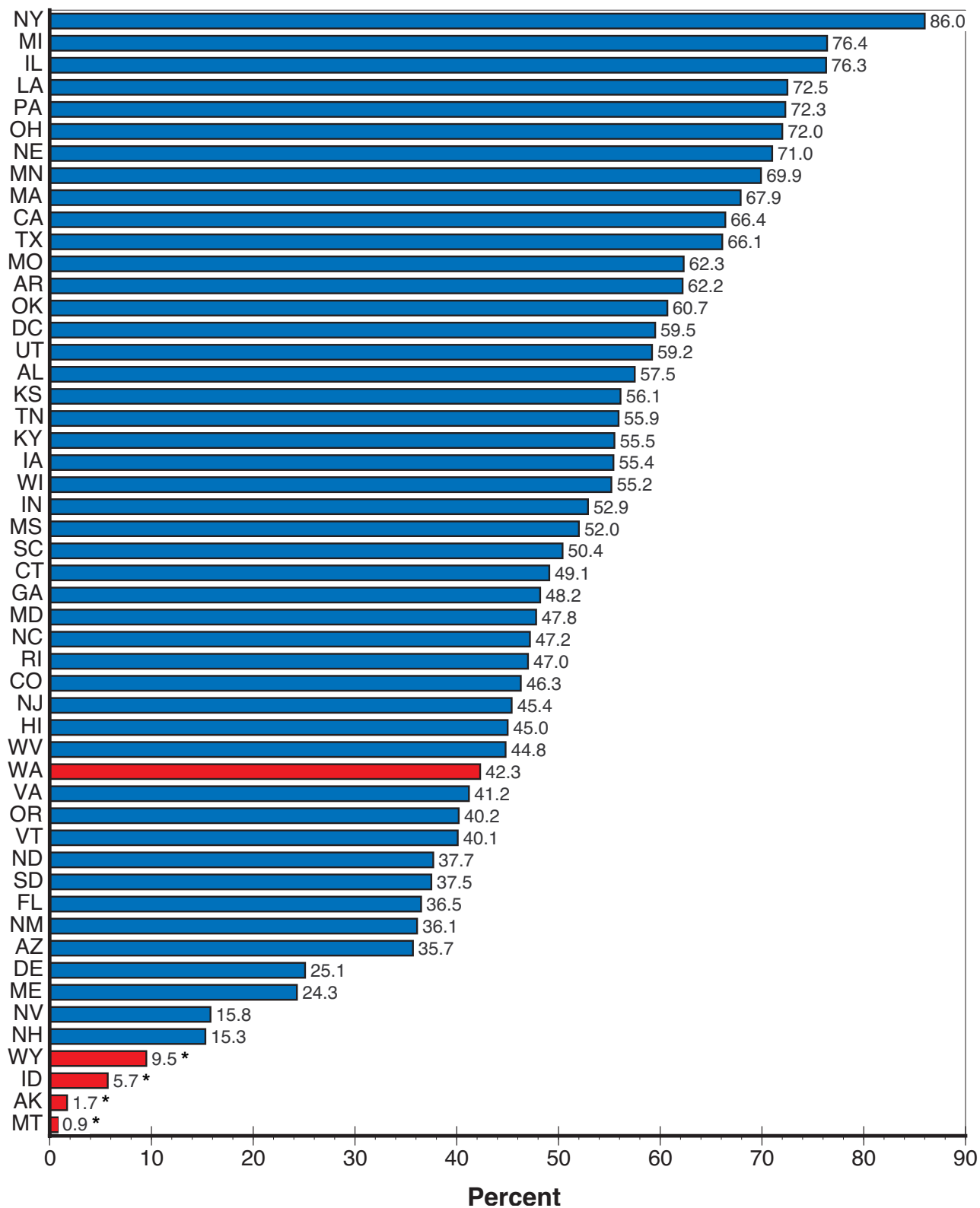


Figure 4: Percentage of State Physicians Who Attended Medical School or Were in a Residency within State, 2005



* See footnote on Figure 2.

practice, the UWSOM should take credit for its WWAMI program, for the WWAMI network of family medicine residencies, and for its support of rural and community-based practice.

Unfortunately, the recent dramatic decline in students graduating into family medicine, the match rate in affiliated family medicine residencies, and the increasing numbers of IMGs in family medicine (who are less likely to practice or stay in rural areas) jeopardizes this success.^{1,6}

In many ways, these findings are a testament to the success of the WWAMI model and training. Despite political and financial incentives to pursue discipline training, UWSOM graduates and other WWAMI physicians have created a medical culture with a foundation in primary care and family medicine. What is concerning, of course, is whether recent trends will erase these success of the past 30 years.

LIMITATIONS

The report examines only the supply of physicians within the WWAMI; it does not address need or demand. Measurements of need and demand are controversial and rely upon modeling and estimates of health care utilization. We have compared the current WWAMI supply to the national averages at county and state levels. While not measuring need or demand, these measures do give an approximation of the relative over- or under-supply of physicians in that area.

Other analytic limitations include:

- *Geographic Unit of Analysis:* The proposed analysis called for data stratified at the state and county level. While these are logical and easily understood, there may be interest in regions within states (primary care – health professions shortage areas), or physician data within cities and towns. The data are coded primarily by ZIP code, which is easily translated into county-level data.
- *Comparison Groups:* We are using the national average of physicians per capita as our comparison standard. Other comparisons may be more useful – such as state averages.
- *AMA Masterfile Weaknesses:* We are using the physician’s reported primary discipline and business ZIP code. There have been previous analyses of the reliability of these data that have demonstrated acceptable, although imperfect, accuracy. Because of reporting delays, AMA Masterfile tends to lag the current situation by up to 2 years.³

CURRENT PHYSICIAN WORKFORCE DEBATE

There has been a recent change in the prevailing sentiment about national physician workforce policy.

For the past twenty years, most workforce analyses had pointed to an impending surplus of physician, thereby calling for limits upon the production of physicians by medical schools, and caps on GME slots in academic health centers. GMENAC and COGME reports predicted physician surpluses of at least 70,000, called for 50 percent of graduates to enter primary care, and informed Congressional actions such as the Balanced Budget Act of 1997.⁷ It should be noted that these projection analyses were based in large part on international comparisons, physician distribution, population disease patterns and projected health needs.

Recent analyses have taken a fundamentally different approach. Instead of assessing the projected health care needs of populations, recent analyses have relied upon estimates of health care demand. For example, Cooper postulates causative links between the size of the economy, demand for health services, and the demand for health professionals to provide these services.⁸⁻¹⁰ His is an economic demand model, as opposed to earlier health-needs models. Another fundamental difference is that demand models predict a shortage of specialty physicians, rather than primary care physicians. Demand-based projections have swayed COGME and AAMC to predict an impending physician shortage and call for, resulting in the AAMC recently recommending 15 percent expansion of medical schools.¹¹

Regardless of the prevailing workforce paradigm, the intentions of physician workforce planning should be made explicit. Is the purpose of physician workforce planning to improve the health outcomes of the population or to maintain the economic growth of the health care system? The Cooper model is relatively silent on the ideal specialty mix of the physician workforce. This is because a demand-based workforce model entrusts physician distribution and composition to market forces and economic incentives. If, however, the purpose of physician workforce planning is to improve measurable health outcomes of the population, there is compelling evidence that a higher ratio of primary care (and specifically family medicine) is positively associated with improved health outcomes such as total mortality, morbidity, access to care, and quality of care.¹²⁻¹⁶ This is especially true in communities who traditionally have poor access to care (e.g., poor, isolated small rural, minority, etc.).

In light of the current momentum to expansion of medical schools, the UWSOM and WWAMI face several questions:

- Will there be an expansion of the medical school, or construction of new medical schools in the WWAMI region?

- If so, for what reasons? Will expansion be guided by physician workforce distribution and composition needs, or demands?
- Since graduate medical education training has a higher retention effect upon physicians, are there ways to expand UW and WWAMI GME programs? The GME ‘caps’ placed by the Balanced Budget Act of 1997 are now under scrutiny and there are already incentives to create new GME positions in rural states.

Finally, the WWAMI Center for Health Workforce Studies conducts policy-relevant workforce research on physicians and other health care workers. Further analyses are being performed with these data.

Examples include:

- IMG analysis – how many IMGs are there in Washington, how are they distributed?
- Age and gender impact on physician distribution, trends and projections.
- Community Health Center vacancies and needs.
- Implications of population and demographic changes in the WWAMI region.
- Tracking and mapping UWSOM and UW residency graduates to their current practice locations, by specialty, and with a special emphasis on WWAMI states.
- Analyses of WWAMI osteopathic physicians.

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APPENDIX A: PHYSICIANS PER 10,000 POPULATION, ALL DISCIPLINES

	Washington	Wyoming	Alaska	Montana	Idaho	US
STATE POP	6,182,560	502,975	654,052	922,057	1,383,295	
Allergy	.10	.06	.08	.08	.07	.11
Anesthesia	1.27	.95	1.15	1.26	.73	1.10
Cardiology	.50	.30	.31	.40	.33	.65
Critical care	.04	.00	.02	.02	.01	.03
Dermatology	.32	.14	.15	.35	.27	.30
Endocrine	.11	.04	.08	.09	.07	.12
ENT	.34	.22	.50	.34	.29	.29
ER	.99	.89	1.07	.95	.81	.76
Family med	3.98	3.98	5.17	4.25	3.48	2.49
Gen int med	2.44	1.73	1.88	2.18	1.38	2.72
Gen peds	1.34	.82	1.38	.92	.73	1.46
Gen prev med	.22	.10	.18	.10	.06	.12
Gen surgery	.65	.85	.98	.92	.77	.72
Geriatrics	.07	.00	.05	.05	.03	.07
GI	.36	.14	.15	.28	.25	.34
Hematology	.07	.00	.03	.04	.01	.06
ID	.12	.10	.02	.03	.04	.13
Med-peds	.05	.06	.08	.07	.01	.07
Nephrology	.14	.08	.06	.12	.07	.18
Neurology	.31	.24	.20	.37	.22	.35
Neurosurgery	.14	.12	.08	.24	.19	.14
Nuc med	.04	.00	.00	.00	.01	.04
Ob-gyn	1.09	.91	1.16	1.10	.93	1.17
Oncology	.25	.10	.12	.24	.15	.23
Ophtho	.55	.32	.40	.57	.41	.55
Orthopedics	.72	1.17	.98	1.13	.85	.64
Pathology	.40	.48	.31	.43	.27	.42
Ped specialty	.25	.00	.17	.10	.14	.29
Plastic surg	.18	.06	.09	.15	.14	.20
Psychiatry	1.11	.74	.95	.91	.57	1.18
Pulmonary	.22	.14	.15	.24	.20	.26
Rad oncology	.13	.14	.09	.12	.10	.12
Radiology	.92	.82	.75	.95	.84	.86
Rehab	.24	.12	.21	.20	.17	.19
Rheumatology	.12	.10	.03	.13	.10	.11
Surg specialty	.33	.18	.18	.25	.21	.34
Unspecified	.07	.00	.06	.02	.07	.06
Urology	.29	.40	.29	.33	.27	.30

APPENDIX B: PHYSICIAN DISCIPLINES (%), BY STATE

	Washington	Wyoming	Alaska	Montana	Idaho
Allergy	0	0	0	0	0
Anesthesia	6	6	6	6	5
Cardiology	2	2	2	2	2
Critical care	0	0	0	0	0
Dermatology	2	1	1	2	2
Emergency med	5	5	6	5	5
Endocrine	1	0	0	0	0
Family medicine	19	24	23	21	23
Gastroenterology	2	1	1	1	2
Gen int med	12	10	10	11	9
Gen surgery	3	5	5	5	5
Geriatrics	0	0	0	0	0
Hematology	0	0	0	0	0
Infectious dis	1	1	0	0	0
Med genetics	0	0	0	0	0
Med peds	0	0	0	0	0
Nephrology	1	0	0	1	0
Neurology	2	1	1	2	1
Neurosurgery	1	1	0	1	1
Nuc med	0	0	0	0	0
Ob-gyn	5	6	6	5	6
Oncology	1	1	1	1	1
Ophthalmology	3	2	2	3	3
Orthopedics	3	7	5	6	6
Otolaryngology	2	1	3	2	2
Pathology	2	3	2	2	2
Ped specialty	1	0	1	0	1
Pediatrics	7	5	7	5	5
Plastic surgery	1	0	0	1	1
Prev med	1	1	1	0	0
Psychiatry	5	4	5	5	4
Pulmonary	1	1	1	1	1
Rad oncology	1	1	0	1	1
Radiology	4	5	4	5	5
Rehab	1	1	1	1	1
Rheumatology	1	1	0	1	1
Surg specialty	2	1	1	1	1
Unspecified	0	0	0	0	0
Urology	1	2	2	2	2

APPENDIX C

PHYSICIANS PER 10,000 POPULATION IN WASHINGTON, BY COUNTY

County	Population	Family Medicine	Internal Medicine	Pediatrics	OB-GYN	General Surgery
Adams County	16622	4.21	0.6	0.6	0.6	0.6
Asotin County	20561	2.92	0.49	0	0.97	0
Benton County	155644	2.18	1.73	1.09	1.54	0.58
Chelan County	67942	5.74	3.53	1.03	1.62	0.74
Clallam County	66960	6.27	1.94	1.34	0.6	0.9
Clark County	384164	2.79	2.13	1.17	1.2	0.34
Columbia County	4135	4.84	0	0	0	0
Cowlitz County	95725	3.34	1.98	1.78	0.94	0.84
Douglas County	34019	2.35	0.59	0	0	0
Ferry County	7296	1.37	0	0	0	0
Franklin County	55200	2.54	1.45	1.27	1.09	0.18
Garfield County	2348	0	0	0	0	0
Grant County	79156	3.41	1.14	0.63	0.63	0.38
Grays Harbor County	69290	1.88	1.73	0.72	0.43	0.72
Island County	76268	4.06	1.57	1.31	0.66	0.66
Jefferson County	26913	5.57	1.86	1.11	0.74	1.11
King County	1784619	4.61	3.85	1.98	1.53	0.81
Kitsap County	239770	3.8	1.58	1.21	1	0.5
Kittitas County	35498	5.07	0.56	0.85	0.28	0.85
Klickitat County	19466	6.16	0	0	0	0.51
Lewis County	70884	3.24	1.41	0.99	0.28	0.85
Lincoln County	10074	5.96	0	0	0	0
Mason County	51394	1.56	0.97	0.39	0.39	0.39
Okanogan County	39367	7.37	0.76	0.51	0.25	0.51
Pacific County	20842	2.4	0	0	0	0.48
Pend Oreille County	12042	4.15	0	0	0.83	0
Pierce County	749451	3.26	2.12	1.44	1.05	0.73
San Juan County	14983	7.34	0.67	0.67	0	0.67
Skagit County	108838	6.43	1.65	1.47	0.92	0.92
Skamania County	10051	1.99	0	0	0	0
Snohomish County	649856	3.34	1.69	0.71	0.62	0.45
Spokane County	433726	4.33	2.58	1.04	1.08	0.81
Stevens County	40842	4.65	1.22	0	0	0.49
Thurston County	221297	4.47	1.58	1.22	1.31	0.45
Wahkiakum County	3806	2.63	0	0	0	0
Walla Walla County	56654	4.94	4.59	2.12	1.24	0.71
Whatcom County	178551	4.82	2.07	1.29	1.18	0.73
Whitman County	41021	3.66	1.95	1.22	0.49	0.49
Yakima County	227285	3.7	1.67	0.97	0.75	0.57

**PHYSICIANS PER 10,000 POPULATION IN WYOMING, BY COUNTY;
1 COUNTY WITH NO PHYSICIANS**

County	Population	Family Medicine	Internal Medicine	Pediatrics	OB-GYN	General Surgery
Albany County	31441	3.82	2.23	0.95	0.95	0.64
Big Horn County	11020	4.54	0	0	0	0
Campbell County	38006	2.1	2.1	1.58	0.79	0.26
Carbon County	15282	4.58	0	0.65	0	0.65
Converse County	12791	3.91	0.78	0	0.78	1.56
Crook County	6022	4.98	0	0	0	0
Fremont County	36370	6.05	1.92	0.82	1.37	1.1
Goshen County	11989	6.67	0.83	0	0.83	1.67
Hot Springs County	4564	8.76	0	0	0	2.19
Johnson County	7618	7.88	0	0	0	1.31
Laramie County	83743	3.22	2.27	1.19	1.07	0.6
Lincoln County	15084	5.3	0	0	0	0.66
Natrona County	67821	3.83	1.62	1.03	1.03	1.03
Park County	25956	6.55	1.93	0.39	1.54	1.16
Platte County	8652	2.31	0	0	1.16	0
Sheridan County	27134	3.32	4.05	0.74	0.74	0.74
Sublette County	6549	6.11	1.53	0	0	0
Sweetwater County	37302	2.41	1.07	0.8	0.8	0.54
Teton County	18713	2.67	4.28	1.6	3.21	1.6
Uinta County	19965	2.5	2	1	0.5	1
Washakie County	7912	6.32	0	0	0	2.53
Weston County	6825	4.4	0	0	0	2.93

**PHYSICIANS PER 10,000 POPULATION IN ALASKA, BY COUNTY;
7 COUNTIES WITHOUT PHYSICIANS**

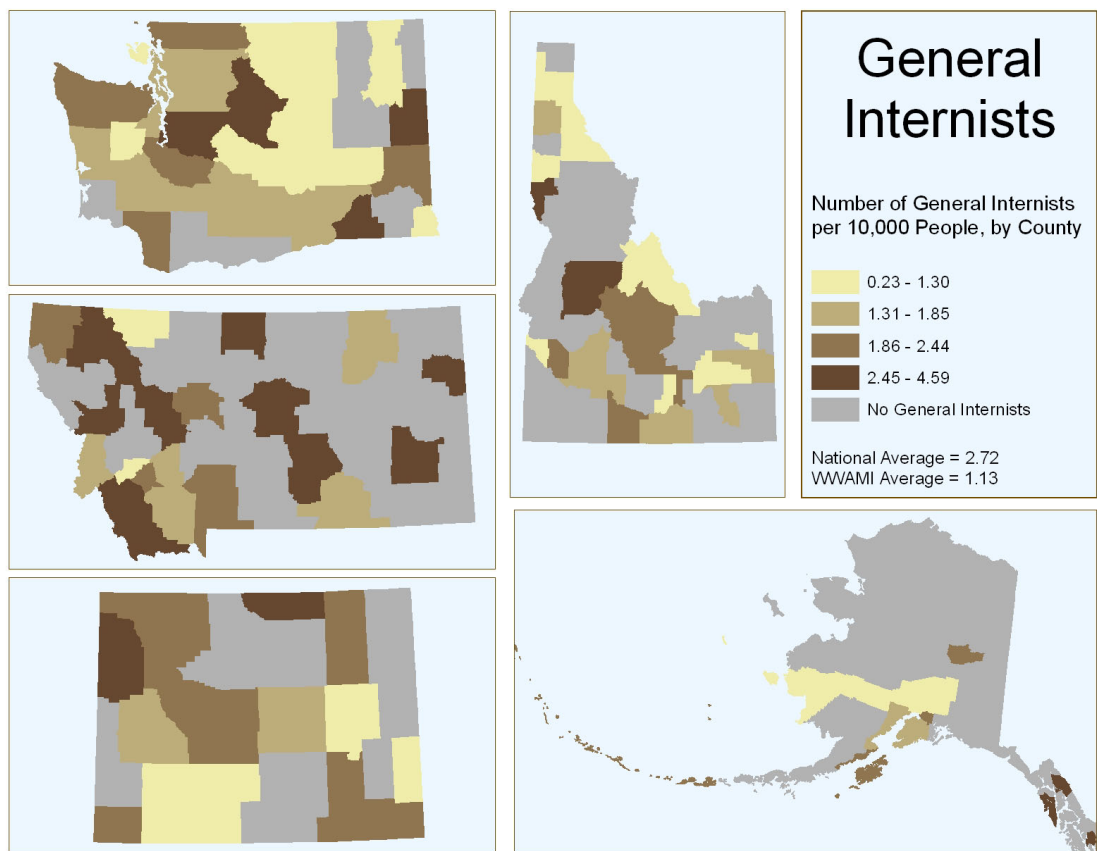
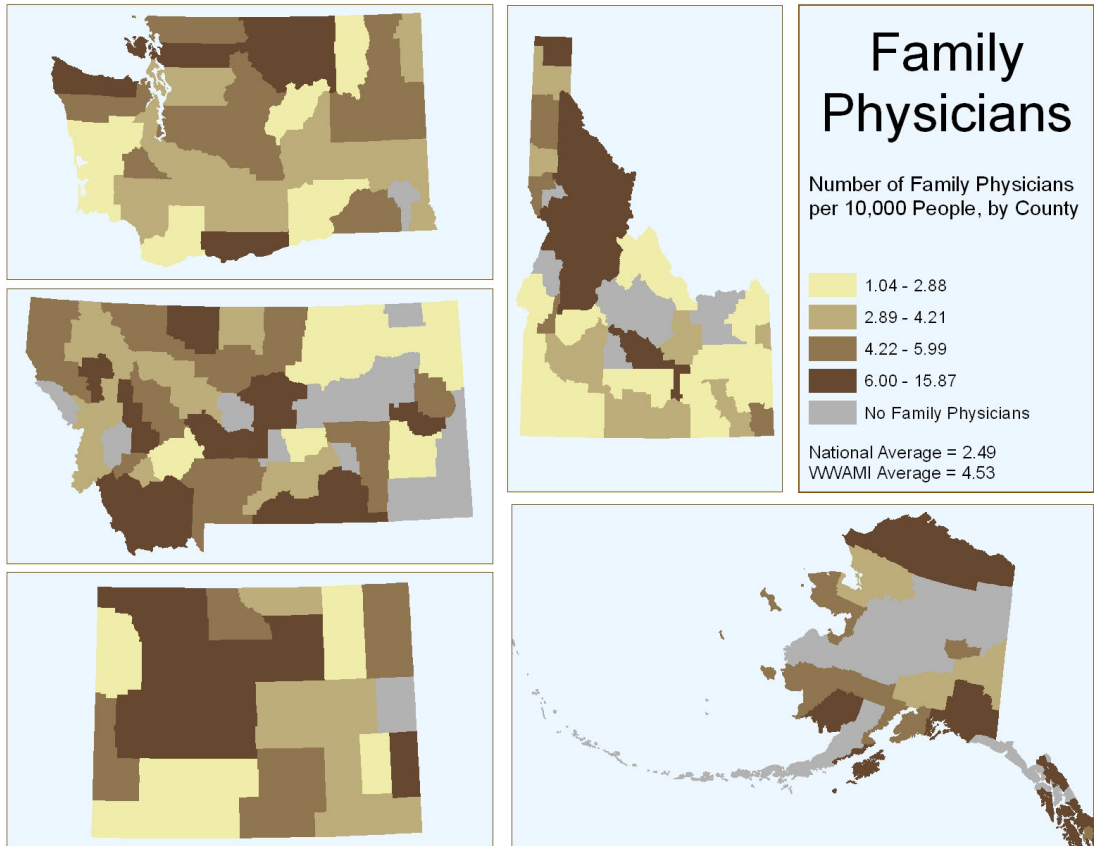
County	Population	Family Medicine	Internal Medicine	Pediatrics	OB-GYN	General Surgery
Aleutians West Census Area	5268	0	1.90	0	0	0
Anchorage Municipality	274477	5.21	2.44	2.08	1.86	1.20
Bethel Census Area	17123	5.84	1.17	1.17	0	0
Dillingham Census Area	5041	15.87	0	1.98	0	0
Fairbanks North Star Borough	86098	5.11	2.44	1.63	1.28	1.28
Haines Borough	2307	13.0	0	0	0	0
Juneau City and Borough	30891	8.74	2.59	1.29	0.32	1.29
Kenai Peninsula Borough	51834	4.44	1.54	0.39	0.58	0.58
Ketchikan Gateway Borough	13346	5.99	3.75	2.25	1.50	2.25
Kodiak Island Borough	13751	6.54	2.18	0	0.73	1.45
Matanuska-Susitna Borough	69135	3.04	0.58	0.43	0.72	0.72
Nome Census Area	9322	5.36	0	0	0	0
North Slope Borough	7136	7.01	0	0	0	0
Northwest Arctic Borough	7312	4.10	0	0	0	0
Prince of Wales-Outer Ketchikan	5415	7.39	0	0	0	0
Sitka City and Borough	8906	12.35	4.49	4.49	1.12	3.37
Southeast Fairbanks Census Area	5591	3.58	0	0	0	0
Valdez-Cordova Census Area	10202	6.86	0	0	0	0
Wrangell-Petersburg Census Area	6291	7.95	0	0	0	0
Yukon-Koyukuk Census Area	6279	0	0	0	1.59	0

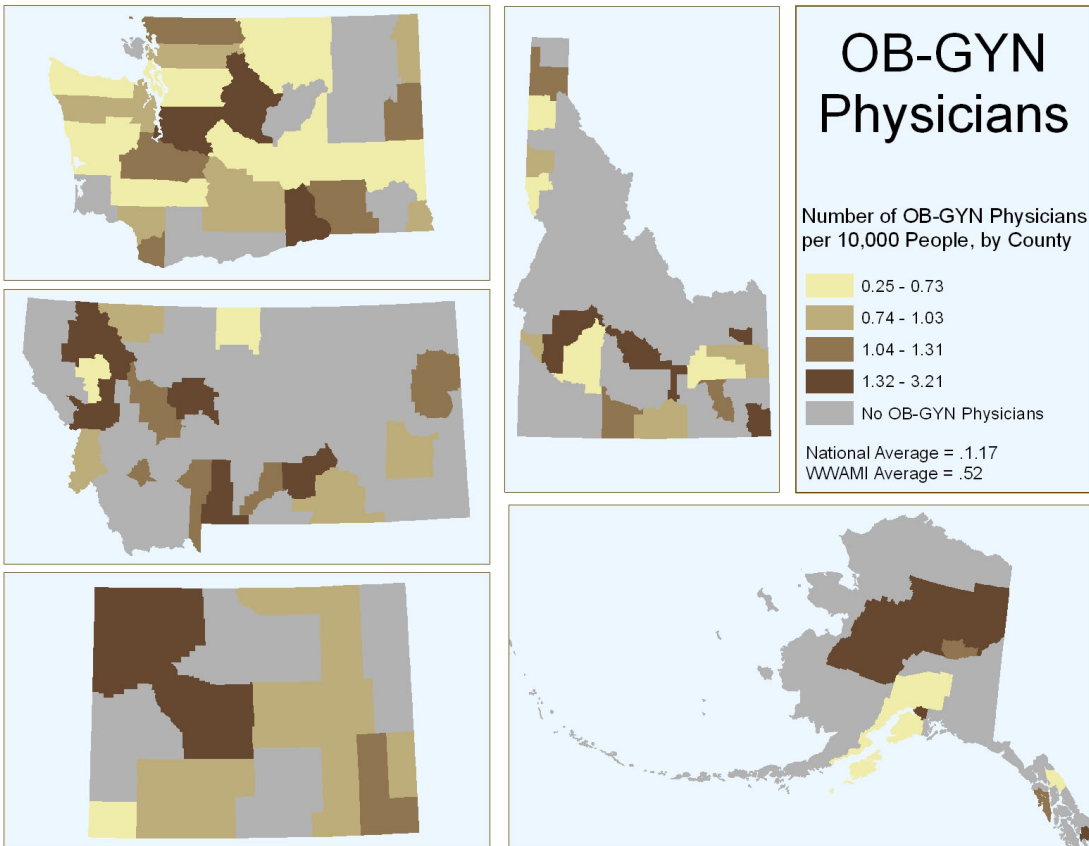
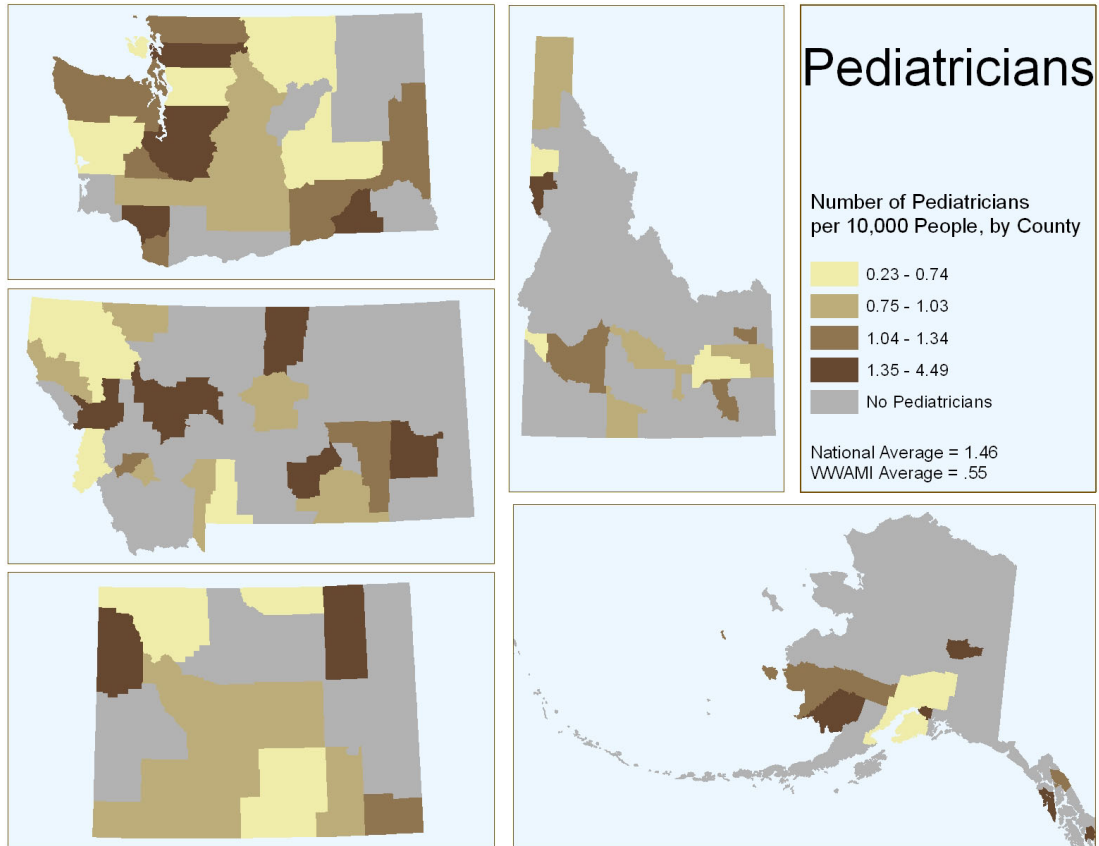
**PHYSICIANS PER 10,000 POPULATION IN MONTANA, BY COUNTY;
11 COUNTIES WITHOUT PHYSICIANS**

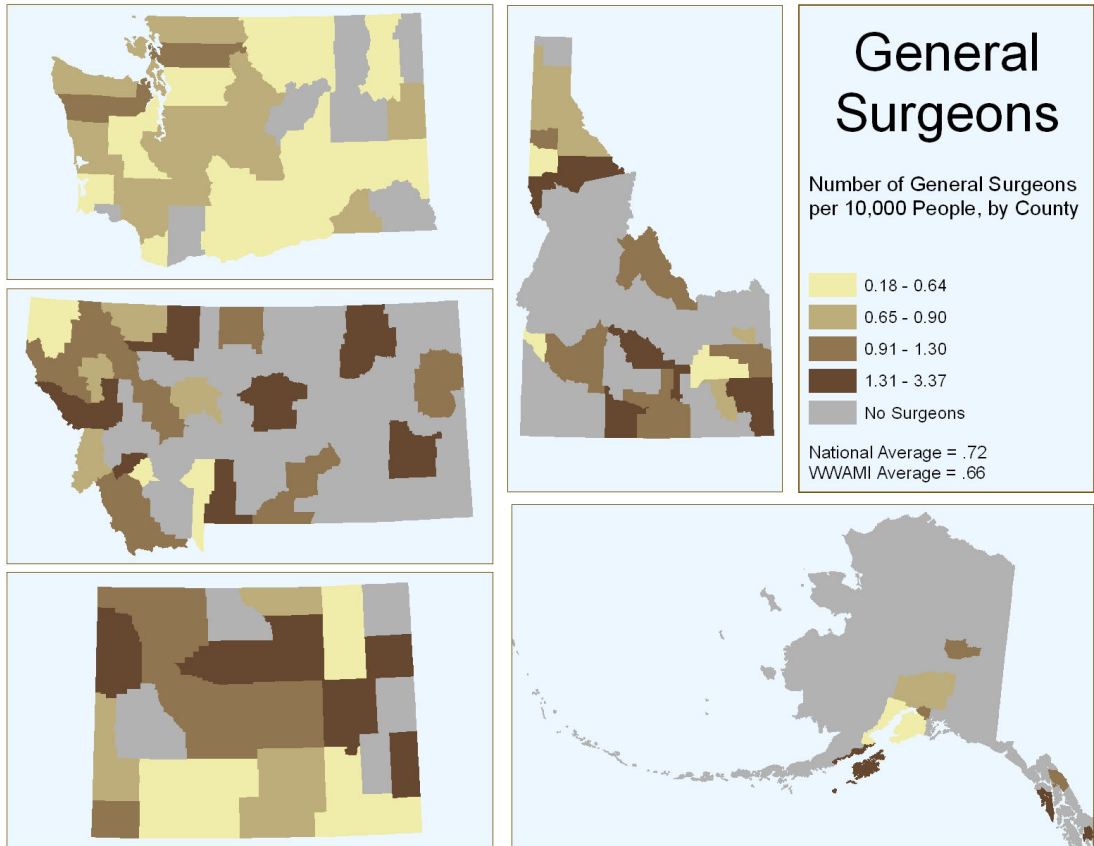
County	Population	Family Medicine	Internal Medicine	Pediatrics	OB-GYN	General Surgery
Beaverhead County	8943	6.71	4.47	0	0	1.12
Big Horn County	13077	9.94	1.53	0.76	0.76	0
Blaine County	6949	5.76	0	2.88	0	0
Broadwater County	4369	2.29	0	0	0	0
Carbon County	9814	6.11	0	0	0	1.02
Cascade County	79462	3.65	2.27	1.51	1.51	0.76
Chouteau County	5323	5.64	0	0	0	0
Custer County	11249	2.67	3.56	2.67	0.89	1.78
Dawson County	8506	5.88	0	0	1.18	1.18
Deer Lodge County	8906	4.49	1.12	1.12	0	2.25
Fergus County	11627	6.02	3.44	0.86	0	2.58
Flathead County	79767	4.14	3.26	0.5	2.01	1.13
Gallatin County	73968	5	2.03	0.95	1.22	0.41
Glacier County	13177	4.55	0.76	0.76	0.76	0.76
Hill County	16248	3.69	2.46	0	0.62	1.23
Jefferson County	10792	1.85	1.85	0	0	0
Lake County	27286	6.96	0	0.37	0.73	0.73
Lewis and Clark County	57479	4.7	4.35	1.39	1.22	1.22
Liberty County	1952	10.25	0	0	0	0
Lincoln County	18729	5.87	2.14	0.53	0	0.53
McCone County	1741	0	0	0	0	0
Madison County	7175	6.97	1.39	0	0	0
Meagher County	1950	15.38	0	0	0	0
Mineral County	3776	0	0	0	0	2.65
Missoula County	100706	3.18	2.88	1.49	1.49	1.39
Musselshell County	4400	2.27	4.55	0	0	0
Park County	15971	5.64	1.88	0.63	2.5	2.5
Phillips County	4179	2.39	0	0	0	0
Pondera County	6122	4.9	0	0	0	1.63
Powell County	7031	8.53	0	0	0	0
Prairie County	1181	8.47	0	0	0	0
Ravalli County	39474	4.05	1.77	0.51	0.76	0.76
Richland County	9052	2.21	3.31	0	1.1	1.1
Roosevelt County	10430	2.88	0	0	0	0
Rosebud County	9306	4.3	0	1.07	0	0
Sanders County	10463	5.73	0	0.96	0	0.96
Sheridan County	3613	2.77	0	0	0	0
Silver Bow County	32969	3.34	2.43	0.91	1.21	0.3
Stillwater County	8594	3.49	0	0	1.16	0
Sweet Grass County	3666	5.46	0	0	0	0
Teton County	6253	3.2	0	0	0	0
Toole County	5019	7.97	0	0	0	1.99
Valley County	7231	1.38	1.38	0	0	1.38
Wheatland County	2151	9.3	0	0	0	0
Yellowstone County	134422	3.72	2.75	1.49	1.64	1.19

**PHYSICIANS PER 10,000 POPULATION IN IDAHO, BY COUNTY;
4 COUNTIES WITHOUT PHYSICIANS**

County	Population	Family Medicine	Internal Medicine	Pediatrics	OB-GYN	General Surgery
Ada County	333798	3.71	2.37	1.11	0.99	1.8
Bannock County	76427	3.14	1.57	1.31	0.65	1.18
Bear Lake County	6307	4.76	0	0	3.17	1.59
Benewah County	8976	5.57	0	0	1.11	0
Bingham County	43175	2.78	0.23	0.23	0.23	0.46
Blaine County	21474	6.99	1.86	0.93	1.4	1.4
Boise County	7356	1.36	0	0	0	1.36
Bonner County	39685	3.02	1.26	0.76	0.76	1.26
Bonneville County	87763	2.85	1.71	0.91	0.91	1.03
Boundary County	10344	6.77	0	0.97	0	0
Butte County	2941	3.4	0	0	0	0
Canyon County	155405	2.45	0.9	0.58	0.64	0.77
Caribou County	7309	1.37	0	0	1.37	0
Cassia County	22081	3.17	1.36	0	0.91	0.91
Clearwater County	8216	12.17	0	0	2.43	0
Custer County	4095	0	2.44	0	0	0
Elmore County	29954	3.34	1.67	1.34	1	0.67
Franklin County	12093	3.31	0	0	0	0
Fremont County	11983	1.67	0	0	0	0
Gem County	15767	5.07	0	0	0	0
Gooding County	14504	2.07	1.38	0	0	0
Idaho County	15281	7.2	0	0	0	0
Jefferson County	20490	0	0	0	0	0
Jerome County	19148	3.66	0	0	1.04	0
Kootenai County	118402	4.56	1.35	0.76	0.76	0.59
Latah County	35619	4.21	0.56	0.28	0.28	0.84
Lemhi County	7693	1.3	1.3	0	1.3	0
Lincoln County	4329	2.31	0	0	0	0
Madison County	28194	2.48	1.06	1.06	0.71	1.42
Minidoka County	19292	1.04	0.52	0	1.04	0
Nez Perce County	37351	4.82	2.95	1.87	1.34	0.54
Oneida County	4123	2.43	0	0	0	0
Owyhee County	10972	2.73	0	0	0	0
Payette County	21488	1.4	0	0	0	0
Power County	7291	1.37	0	0	0	0
Shoshone County	12653	6.32	0.79	0	0.79	0
Teton County	7504	4	0	0	0	0
Twin Falls County	67027	3.73	1.94	0.9	1.49	1.04
Valley County	7438	9.41	2.69	0	0	0
Washington County	9958	2.01	0	0	0	0







APPENDIX D: PHYSICIAN RATIOS PER 10,000 POPULATION, BY RUCA,* ALL DISCIPLINES

	Urban	Large Rural	Small Rural	Small Isolated
Allergy	.12	.06	.00	.03
Anesthesia	1.48	1.03	.38	.16
Cardiology	.61	.28	.02	.00
Critical care	.04	.01	.00	.01
Dermatology	.37	.27	.11	.00
Endocrine	.13	.04	.00	.01
ER	1.10	1.02	.73	.28
Family med	3.99	4.28	5.35	3.89
Gen pediatrics	1.45	1.11	.61	.21
Gen surgery	.74	.85	1.12	.18
Geriatrics	.07	.05	.04	.00
GI	.41	.23	.04	.01
Hematology	.08	.02	.00	.00
Infectious dis	.14	.03	.01	.00
Internal med	2.59	2.24	1.46	.26
Med-peds	.05	.02	.12	.01
Nephrology	.17	.05	.01	.01
Neurology	.38	.24	.08	.00
Neurosurgery	.21	.09	.01	.01
Nuclear med	.04	.01	.01	.00
Ob-gyn	1.28	1.02	.68	.10
Oncology	.29	.16	.04	.04
Ophthalmology	.62	.58	.21	.00
Orthopedics	.88	1.05	.76	.16
Otolaryngology	.42	.33	.11	.03
Pathology	.46	.39	.14	.04
Peds specialty	.30	.02	.01	.03
Plastic surgery	.22	.10	.02	.04
Preventive med	.23	.08	.07	.06
Psychiatry	1.26	.76	.38	.15
Pulmonary	.28	.13	.04	.01
Rad oncology	.15	.09	.08	.01
Radiology	1.04	.98	.55	.18
Rehab	.30	.13	.07	.01
Rheumatology	.16	.05	.00	.00
Surg specialty	.39	.11	.11	.01
Unspecified	.07	.07	.02	.01
Urology	.35	.35	.11	.01

* Rural-Urban Commuting Area.

RELATED RESOURCES FROM THE WWAMI CENTER FOR HEALTH WORKFORCE STUDIES AND THE RURAL HEALTH RESEARCH CENTER

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Hollow WB, Patterson DG, Olsen PM, Baldwin LM. *American Indians and Alaska Natives: how do they find their path to medical school?* Working Paper #86. Seattle, WA: WWAMI Center for Health Workforce Studies, University of Washington; 2004.

Patterson DG, Skillman SM. *Health professions education in Washington State: 1996-2004 program completion statistics*. Working Paper #94. Seattle, WA: WWAMI Center for Health Workforce Studies, University of Washington; 2004.

Patterson DG, Skillman SM, Hart LG. *Washington State's pharmacist workforce through 2020: influential factors and available data*. Working Paper #90. Seattle, WA: WWAMI Center for Health Workforce Studies, University of Washington; 2004.

Skillman SM, Andrilla CHA, Hutson T, Deacon H, Praseuth T. *Washington State hospitals: results of 2003/04 Workforce Survey*. Working Paper #93. Seattle, WA: WWAMI Center for Health Workforce Studies, University of Washington; 2004.

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Wright GE, Paschane DM, Baldwin LM, Domoto P, Cantrell D, Hart LG. *Distribution of the dental workforce in Washington State: patterns and consequences*. Working Paper #60. Seattle, WA: WWAMI Center for Health Workforce Studies, University of Washington; 2001.

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