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Modeling the Mental Health Workforce in Washington State:

Using State Licensing Data to Examine Provider Supply in Rural and Urban Areas

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 five regional centers funded by the National Center for Health Workforce Information and Analysis (NCHWIA) of the federal Bureau of Health Professions (BHPr), Health Resources and Services Administration (**HRSA**). Major goals are to conduct high-quality health workforce research in collaboration with the BHPr 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 widely disseminate 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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Abstract

Objectives: To identify mental health shortage areas using existing licensing and survey data.

Methods: Department of Health files on credentialed health professionals, a simple licensure renewal survey, the 1990 U.S. Census, and the National Comorbidity Survey were used to calculate supply and requirements for mental health services in urban and rural areas of Washington State in 1998-1999.

Results: Notable shortages of mental health providers existed throughout the state, especially in rural areas. Over 80 percent of rural Health Service Areas had at least 10 percent fewer psychiatrists and nonpsychiatrist mental health providers than the state ratio (10.4/100,000 and 306.5/100,000, respectively).

Conclusions: States gathering a minimum database at licensure renewal on specialty, location, hours, and visits can demonstrate area-specific mental health care shortages for use in program planning.

Introduction

Mental health is integral to the overall health of a population. One in five Americans experiences a mental disorder per year. Mental illness is the second leading cause of disability and premature mortality (U.S. Department of Health and Human Services, 1999). The effectiveness of treatments for many mental health disorders has been documented, ranging from psychopharmacologic therapy offered by providers with prescriptive authority, such as psychiatrists and primary care providers, to psychotherapy and counseling provided by practitioners with varied training and background.

An effective mental health system needs an adequate and equitably distributed supply of mental health providers. Ongoing efforts to identify individuals with mental disorders and to create parity in insurance coverage for these disorders (Branstrom & Sturm, 2002; Mechanic, 2002; President's New Freedom Commission on Mental Health, 2003; Sturm & Pacula, 1999; Sturm & Pacula, 2001; U.S. Preventive Services Task Force, 2002) may result in increased diagnoses of mental health disorders and demand for treatment. Ensuring the adequacy of the mental health provider supply requires methods of identifying various provider types, their practice locations, and practice productivity.

Most studies enumerating the mental health workforce have focused on psychiatry (Dial et al., 1998; Eveland et al., 1998; Goodman et al., 1996; Wennberg & Cooper, 1996; West et al., 2001) and have used institution-specific or American Medical Association (AMA)-based data to develop estimates of the number of providers or full-time equivalent (FTE) providers per 100,000 population. For the nonpsychiatric mental health workforce, most estimates have been obtained from professional organizations, which do not represent the entire profession, or from health maintenance organizations, whose benefits differ from those of private insurers (Dial et al., 1998; Ivey et al., 1998; Scheffler & Ivey, 1998). Studies examining the rural-urban distribution of mental health providers have generally done so at the level of the county rather than functional health service areas (Goldsmith et al., 1997; Holzer et al., 1999; Knesper et al., 1984; Merwin et al., 1995). In contrast, this study uses state health professional licensing data to examine the supply of a full range of mental health professionals in ZIP code-based rural and urban medical service areas. It also uses data on mental health service utilization from a population-based survey to project the number of psychiatric visits required so we can identify areas with deficits in these services.

Methods

Data Sources

Provider Supply: To estimate the supply of mental health services in Washington State, we used the 1998-1999 Washington State Department of Health, Health Professions Quality Assurance (HPQA), licensing data and the Washington State Department of Health's 1998-1999 survey of credentialed health care professionals. The HPQA database maintains demographic information on health care professionals linked to the type of professional license they obtained (e.g., MD, osteopathic physician, psychologist). From 1990 to 1998, these professionals received a survey with their license renewal notices, asking for information on their area of specialization (e.g., mental health, administration, public health), whether they were actively practicing, their practice site (e.g., office setting, school), and the number of weeks worked in the past year. Providers were asked for ZIP codes of up to two practice sites, the number of hours worked, and ambulatory visits provided in a typical week in these sites. Using these data sources, we calculated the number of mental health visits provided by mental health professionals in small geographic units of Washington.

Provider Requirements: Data from the 1990 U.S. Census and the National Comorbidity Survey (NCS) were used to estimate requirements for psychiatric visits in the same geographic units (Kessler, 2002; Kessler et al., 1994). The NCS examined the prevalence of mental illness and the utilization of mental health services in a nationally representative community population aged 15 to 54. The survey was administered between 1990 and 1992, with a response rate of 82.6 percent (N = 8,098). The NCS contains information on the number of outpatient mental health visits to a variety of mental health and other medical professionals in the year before the survey. We were unable to measure requirements for mental health visits to nonpsychiatric providers because of differences in Washington State licensing data and NCS definitions. We matched sociodemographic information on individuals completing the NCS to similar information from the 1990 U.S. Census to project the number of psychiatric visits needed by ZIP code in Washington State.

Identification of Mental Health Providers

We used the type of provider license or registration issued by the Washington State Department of Health, HPQA, the area of specialty from the Department of Health's survey, and the specialty linked from the 1998 AMA Masterfile to identify mental health professionals. Mental health professionals included those licensed as psychologists, mental health counselors (MHs), and marriage and family counselors (MFs), and those registered as counselors (RCs) and hypnotherapists (HPs). Physicians (MDs and DOs) were identified as psychiatrists if they (1) listed psychiatry, hypnosis/counseling, mental health, psychology, or chemical dependency as their primary specialty area on their licensing surveys, or (2) listed an administrative, educational, or public health position as their primary specialty and one of the mental health areas listed above as their secondary specialty. Physicians who did not complete a licensing survey but listed psychiatry as their specialty in the AMA Masterfile were identified as psychiatrists. Certified social workers (CSWs), two types of nurses (LPNs and RNs), physician assistants (PAs), and nurse practitioners (NPs) were considered mental health providers if they met the same criteria as the physicians on their licensing survey. We developed and applied a hierarchy for those licensed as more than one provider type (multiple licensees).

We excluded mental health providers who were (1) under age 18 or 70 years or older in the year of the survey, (2) not in active practice, (3) not practicing in Washington State, (4) working as medical residents or trainees, (5) working only in a military or prison setting, and (6) working only in an inpatient setting.

For the majority of our study analyses, mental health providers were aggregated into two groups—psychiatrists and other mental health providers.

Determination of Mental Health Supply

Mental health supply was measured by the number of outpatient mental health visits provided by the provider groups in different geographic areas of the state. The provider survey supplied the average weekly number of ambulatory visits they provided in up to two separate work locations, and the number of weeks worked in the previous year. These data were used to calculate the number of mental health visits offered by each mental health provider the prior year.

Data for individual providers were aggregated first to the level of the provider type, then into psychiatrist or other mental health provider groupings. We measured the supply of different provider types (1) across Washington State, (2) in individual Health Service Areas (HSAs), (3) in rural and urban geographic units, and (4) in 13 regions that aggregate rural and urban HSAs based on proximity to psychiatric services within the state.

We used the 124 ZIP code-based generalist HSAs developed with the Washington State Department of Health as our basic geographic unit of analysis. Fifty-two HSAs are considered rural and are based on the normative service areas of the state's rural hospitals and clinics. In some analyses, rural HSAs were collapsed into four groups, depending on whether the size of the largest town in the HSA exceeds 10,000 residents and whether it is adjacent to an urban HSA. We collapsed the 72 urban HSAs into nine large urban cores (Seattle, Bellingham, Everett, Olympia, Tacoma, Vancouver, Spokane, Yakima, and the "Tri-Cities" of Pasco, Richland, and Kennewick). As a regional center for tertiary care and medical education, physician supply and specialty mix in Seattle differs from other urban cores. In some analyses, the Seattle metropolitan core is compared to all other urban cores of the state. In county-based definitions of rurality, such as the metropolitan/nonmetropolitan definition or the Urban Influence Codes (Ricketts et al., 1998), some geographically large counties include both very large cities and isolated rural areas, resulting in misclassification of parts of a county's population. The use of ZIP code-based units avoids these problems and results in more realistic service areas.

Recognizing that rural areas may not have the population to sustain viable psychiatric practices, we identified 13 mental health care regions and compared mental health supply and requirements across them. In this regional scheme, all rural HSAs were linked to the nine urban cores, or four large rural centers with substantial psychiatric resources (Pullman-Clarkston, Wenatchee, Longview-Centralia-Chehalis, Port Angeles). Rural areas were grouped with urban cores or large rural centers based on their proximity to the urban center and our knowledge of the organization of specialty care for rural residents.

Our primary model for supply of mental health visits estimates the actual number of visits provided by the mental health providers in our study. To minimize the effect of outliers, we truncated visits at 200. While 200 visits may seem high, some mental health providers conduct group sessions. If truncation at this level overestimated supply, it was a conservative estimate of mental

health shortage areas. Only 0.2 percent of providers reported more than 200 visits per week.

We used a second model that estimates the supply of visits adjusted for a "reasonable workload" for each provider type. In this model, we calculated each provider's FTE by dividing the number of visits by the median number of visits provided by full-time providers of that type. We identified the number of visits at the eightieth percentile FTE level for each provider type, and limited providers in each type to the number of visits at this level. We considered this the maximum number of visits that could be expected of a full-time provider with a reasonable workload (Reasonable Workload FTE).

Identification of Psychiatric Care Requirements

We estimated the number of psychiatric visits required by the population aged 15 years and older in each HSA of Washington State using the 1990 U.S. Census data on population size and characteristics, and NCS data on psychiatric service use by population characteristics. The average number of psychiatric visits for the study groups (e.g., different age, household income, and sex groups) was obtained from the NCS data and applied to the population figures for each HSA. This provided an estimate based on national averages of the number of psychiatric visits required in each HSA, representing the "estimated demand" for psychiatric care in Washington's population. We repeated these steps using age and sex groupings only, and applied NCS data for the privately-insured segment of these populations to project the demand for mental health visits if the entire population had private insurance covering outpatient psychiatric visits ("estimated fully insured demand").

Analysis

We enumerated the providers in each mental health group and calculated the number of providers per 100,000 individuals overall and in rural and urban areas separately. We then calculated two types of FTEs as discussed above—FTEs without outliers and Reasonable Workload FTEs—and their number per 100,000 individuals in Washington's population overall and subdivided into different types of areas. We calculated FTEs for each provider type by dividing the number of visits provided by each mental health provider by the median number of visits for these providers, summing these FTEs for the provider type, then dividing by the population size and scaling to 100,000. A

similar process was used for the Reasonable Workload FTEs but with a truncation at the eightieth percentile FTE level.

We compared requirements for, and supply of, nonpediatric psychiatric visits in individual HSAs, the nine urban cores, and the thirteen state regions. Two scenarios comparing requirements and supply for psychiatric services were created. We first compared the estimated demand for services with the actual supply to determine locations in Washington State with unmet mental health service needs.

Results

We identified 20,325 mental health providers in Washington State during the 1998-1999 study period. Only 670 of these providers were psychiatrists. Of the remaining 19,655 providers, the majority (11,593) were registered counselors, who are registered to provide mental health services but have not necessarily completed formal, recognized professional mental health training programs. Table 1 presents the number of providers and FTEs per 100,000 for each mental health professional group separately. FTE figures were lower than the number of providers, depending on the proportion that worked part time. On average, the Reasonable Workload FTE figures were about 8 percent lower than the regular FTE figures, with relatively little variation between provider types (not shown).

Dramatic differences can be seen between these figures in rural and urban areas (Tables 2 and 3). Urban areas had three times as many psychiatric providers and FTEs per 100,000 and over one and a half times the nonpsychiatric mental health providers and FTEs per 100,000 than rural areas. Within urban areas, the Seattle metropolitan area had a much larger supply of psychiatrists and nonpsychiatric mental health providers than other metropolitan areas in Washington. Reasonable Workload FTEs followed the same pattern (not shown).

There were differences within rural areas in mental health provider supply as well. Rural HSAs with towns of over 10,000 people had more psychiatrists and nonpsychiatric mental health providers than rural HSAs with smaller towns. Importantly, the supply was much lower in all types of rural areas compared to metropolitan and overall state figures.

Figure 1 illustrates these findings at the HSA level. Thirty-five of the fifty-two rural HSAs had no psychiatrist FTEs, and an additional nine were over 10 percent below the state ratio of 10.4 psychiatrist FTEs per 100,000 people. Five of the nine urban HSA cores were over 10 percent below the state ratio. All rural HSAs had nonpsychiatric mental health providers, but 43 rural HSAs were over 10 percent below the state ratio of 306.5 nonpsychiatrist mental health professional FTEs per 100,000 people. Three of the nine urban HSA cores were over 10 percent below the state ratio. HSAs with fewer psychiatric services also had fewer nonpsychiatric services. Similar results were found for the number of providers per 100,000 and the Reasonable Workload FTEs per 100,000 by HSA (not shown).

When HSAs were aggregated to the 13 state regions to account for referral patterns in the calculation of supply, shortages of mental health care persisted (Figure 2). Ten regions were over 10 percent below the state ratio of 10.4 psychiatrist FTEs per 100,000 people (Figure 2). Seven of these regions were over 10 percent below the state ratio of nonpsychiatric mental health provider FTEs per 100,000 people.

Overall in the state, assuming "estimated demand" for psychiatric services, there was a surfeit of 185,637 psychiatric visits (Table 4). Subanalysis by rural and urban areas paints a different picture, however. The Seattle metropolitan area had a dramatic surfeit of visits, while there was a near balance of visits in other metropolitan cores. Rural areas of all types had large deficits for their population sizes.

When the psychiatric visit requirements estimate was made for a population that has universal private mental health insurance coverage, the estimated number of mental health visits rises. We project a deficit of over 400,000 psychiatric visits in urban areas, and about 300,000 visits in rural areas. With the median psychiatrist in our study providing 36 visits per week and working 46 weeks per year, we estimate that each psychiatrist provides about 1,656 visits per year. Our projected psychiatric visit requirements suggest that Washington would have a deficit of over 400 psychiatrists if universal private mental health insurance coverage were available and used at the same rate as those surveyed in the NCS.

Figure 3 maps the balance between psychiatric visit requirements and supply in the 13 state regions among a population with the level of mental

health insurance coverage at the time of the NCS and demonstrates gaps in psychiatric services in all but the Seattle and Tacoma regions.

Discussion

This study demonstrates that professional licensing data supplemented by a brief survey can be used to delineate the supply of a full range of mental health professionals at a state and geographic service area level. The number of psychiatrists per 100,000 calculated in this study is roughly comparable with published figures for Washington State and the U.S. based on AMA Masterfile data (West et al., 2001). Figures for psychologists are also roughly comparable, although somewhat lower in this study compared to professional society membership information. Our reported rate of clinical social workers is also lower than other published figures using professional society data, since we included only those clinical social workers who indicated mental health as an area of specialization, excluding those who provided social services and case management.

The data from these analyses are useful in identifying areas of relative shortage within Washington State. Most striking is the relative shortage of mental health professionals of all types in rural areas, consistent with findings of several other studies (Bird et al., 2001; Goldsmith et al., 1997; Holzer et al., 1999; Knesper et al., 1984; Merwin et al., 1995; Stuve et al., 1989). Urban areas overall had more than three times the number of psychiatric FTEs than rural areas, with small rural areas having even greater deficits. There were 35 rural HSAs with no practicing psychiatrists. Eighty-five percent of the rural HSAs and 56 percent of the urban HSA cores had at least 10 percent fewer psychiatrists per 100,000 people than the state ratio. This translates into 2,793,494 people who lived in areas of Washington State with compromised access to psychiatric services and 600,470 people living in HSAs without any psychiatric services.

Several authors have suggested the use of more conservative benchmarks against which to measure a region's workforce (Goodman et al., 1996; Schroeder, 1996; Wennberg & Cooper, 1996). If we use the much lower ratio of psychiatrists to population in a hospital referral region with a low rate of physician deployment (Wichita, Kansas: 6.8/100,000), Washington still has 85 percent (44) of its rural and 22 percent (2) of its urban HSA cores with lower ratios than this benchmark (Goodman et al., 1996; Wennberg & Cooper, 1996). Six of the

thirteen state regions also had psychiatrist-to-population ratios that were lower than this more conservative benchmark.

Nonpsychiatric mental health providers were also in relatively short supply in rural Washington. Urban areas had over one and a half times the number of nonpsychiatric FTEs than rural areas. Of the 52 rural HSAs, 83 percent had at least 10 percent fewer providers per 100,000 population than the state ratio. One-third of the urban HSA cores had at least 10 percent fewer providers per 100,000 population than the state ratio. This translates into 2,049,833 people who lived in areas with compromised access to nonpsychiatric mental health services.

This relative shortage of psychiatrists and nonpsychiatric mental health providers signifies a potential lack of specialty services for individuals with mental health disorders, and overload for other medical personnel, such as primary care practitioners, and the less formal mental health support networks, such as clergy and school counselors (Kessler et al., 1994; Regier et al., 1993; Shapiro et al., 1984). Rost et al.'s study of depression treatment in Arkansas demonstrated a decreased frequency of outpatient mental health specialty visits associated with three times the rate of inpatient hospitalizations for both mental health and physical problems in rural compared to urban areas (Rost et al., 1999; Rost et al., 1998). These hospitalizations cost over $120,000,000 in 1994 dollars each year.

We were surprised by the enormous contribution made by registered counselors in both rural and urban areas. They comprised 60 percent of all nonpsychiatric mental health providers, whether measured by head count or FTE, and supplied 55 percent of the nonpsychiatric mental health visits. Registered counselors have not received masters level mental health training, and have minimal requirements to gain their registration status with the Department of Health, Health Professions Quality Assurance. Further evaluation of the qualifications of this group, the types of mental health services, and the outcomes of the services they provide would be useful.

This study used data from a brief survey at health professional licensure renewal to examine not only the number of practicing mental health providers of different types, but also to estimate the number of practicing FTEs based on the outpatient visits each provider offered. This analysis demonstrated that about 1.14 psychiatrists and about 1.13 nonpsychiatric mental health providers are needed to provide a single FTE for each group respectively. Estimates of the

number of mental health providers required to meet a population's needs must account for part-time practice patterns.

This study is limited in several ways. First, it does not include clergy and school counselors, unless they were registered or licensed through one of the professions captured in this study. This results in an underestimate of the counseling resources available. Second, we were unable to identify travel patterns for mental health care. Rural populations may travel to urban centers to obtain mental health care, especially from psychiatrists or psychologists. This might partially account for the higher urban provider-to-population ratios of these providers. The 13 state regions we created account for some of these travel patterns. These regions were developed based on psychiatric service availability and travel distance between towns rather than actual mental health referral and consultation patterns, however. We did not identify telepsychiatry visits, which can modify travel and consultation patterns (Brown, 1998; Sumner, 2001). Third, this study examined only outpatient mental health services. Fourth, our psychiatric visit requirements figures must be interpreted with some caution, as they were estimates calculated from population statistics and available survey data rather than actual visit counts. These requirements are underestimates of true need for mental health services. Over 50 percent of individuals with a psychiatric disorder are not recognized as having a mental illness (Higgins, 1994), and only about a fifth of NCS respondents with a mental health disorder over the year prior to the survey had treatment for their disorders during that time (Kessler et al., 1994). Rost et al. found that of those in treatment, less than a third were receiving care concordant with published guidelines (Rost et al., 1999; Rost et al., 1998). An increase in diagnosis and treatment of mental health disorders would exacerbate identified shortages in mental health services. Last, this study did not separate pediatric and adult mental health services. Anecdotal information suggests an acute shortage of pediatric mental health services statewide that we did not capture in this analysis due to lack of psychiatric visit data for children.

States that license mental health providers specific to their profession have a wealth of data from which to enumerate the mental health services available to their populations. If all states collected a minimum amount of data on practice specialty, practice locations, and the number of hours worked and outpatient visits conducted in each location, they could demonstrate area-specific shortages in mental health providers. State and federal programs could use these data to identify mental health shortage within states and nationally, and educational programs could work with shortage areas to place providers upon

graduation from their programs. While this study has demonstrated that certain urban areas of our state were well supplied with mental health services, there were substantially fewer mental health providers in rural areas. As insurers are required to cover mental health services at the same level as medical services, and providers are trained to identify currently undiagnosed patients with mental health disorders, rural areas will have an even more acute shortage of mental health providers, and urban areas may begin to experience shortage as well. Being able to illustrate these trends with data such as those used in this study provides a powerful tool to plan and shape the mental health workforce in the U.S.

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Table 1: Supply of Washington State Mental Health Professionals by Profession Type, 1998-1999

Provider Type	Number of Providers	Providers Per 100,000 Population	Number of FTEs	FTEs Per 100,000 Population	# Providers Per 100,000 in Literature*	
					Washington State	U.S.
Psychiatrists	670	11.8	587	10.4	12.4	14.2
NPs/PAs	220	3.9	199	3.5		
Psychologists	1,244	21.9	1,027	18.1	24.3	28.4
LPNs	459	8.1	427	7.5	6.1	2.6
RNs	1,304	23.0	1,135	20.0		
CSWs	1,315	23.2	952	16.8	28.0	36.2
MFs/MHs	2,691	47.4	2,544	44.8	57.0	52.9
RCs	11,593	204.3	10,444	184.1		
HPs	163	2.9	74	1.3		
Multiple licensees	666	11.7	591	10.4		
Total	20,325	358.2	17,980	316.9		

* Peterson et al., 1999; West et al., 2001.

Table 2: Supply of Washington State Mental Health Professionals (FTEs per 100,000) by Geographic Location, 1998-1999

Mental Health Profession	Urban		Rural			
	Seattle Metro	Other Metro	> 10K, Adjacent	> 10K, Nonadjacent	< 10K, Adjacent	< 10K, Nonadjacent
	FTE/100,000 (N*)	FTE/100,000 (N*)	FTE/100,000 (N*)	FTE/100,000 (N*)	FTE/100,000 (N*)	FTE/100,000 (N*)
Psychiatrists	17.9 (378)	8.3 (234)	4.3 (24)	5.9 (18)	2.0 (8)	3.3 (8)
NP/PAs	5.4 (113)	3.2 (82)	1.7 (9)	2.7 (10)	0.0 (0)	1.3 (6)
Psychologists	28.0 (636)	16.9 (494)	8.5 (48)	11.6 (43)	3.8 (12)	2.7 (11)
LPNs	3.6 (60)	13.2 (356)	4.6 (26)	0.9 (4)	2.8 (11)	0.4 (2)
Registered nurses	23.6 (501)	23.9 (670)	12.6 (69)	7.1 (27)	6.2 (21)	3.7 (16)
CSWs	26.1 (684)	14.1 (468)	9.8 (66)	10.8 (38)	6.3 (27)	8.6 (32)
MH/MFs	59.7 (1,179)	43.7 (1,121)	29.6 (153)	32.2 (93)	15.8 (58)	27.8 (88)
RCs	219.8 (4,558)	182.5 (4,897)	143.3 (785)	163.1 (535)	119.5 (397)	124.4 (421)
HPs	1.8 (66)	1.4 (62)	1.3 (17)	1.5 (6)	0.6 (5)	1.0 (7)
Multiple licensees	13.2 (286)	10.3 (268)	8.3 (51)	8.7 (32)	2.8 (7)	6.8 (22)

* N refers to the number of individuals from whom the FTE count was derived.

Table 3: Supply of Washington State Mental Health Professionals by Geographic Location, 1998-1999

Geographic Location	Number of Providers	Providers Per 100,000 Population	Number of FTEs	FTEs Per 100,000 Population
Urban:				
Psychiatrists	612	14.2	533.8	12.4
Other mental health providers (MH)	16,498	382.5	14,643.9	339.5
Seattle Metropolitan:				
Psychiatrists	378	20.6	328.6	17.9
Other MH	8,082	440.4	6,995.2	381.2
Other Metropolitan Areas:				
Psychiatrists	234	9.4	205.2	8.3
Other MH	8,416	339.6	7,648.7	308.7
Rural:				
Psychiatrists	58	4.3	53.7	3.9
Other MH	3,152	231.6	2,747.6	201.8
> 10K, Adjacent:				
Psychiatrists	24	5.0	20.6	4.3
Other MH	1,224	252.7	1,064.0	219.7
> 10K, Nonadjacent:				
Psychiatrists	18	6.0	17.8	5.9
Other MH	788	262.5	716.4	238.6
< 10K, Adjacent:				
Psychiatrists	8	2.8	5.6	2.0
Other MH	538	186.9	453.9	157.7
< 10K, Nonadjacent:				
Psychiatrists	8	2.8	9.7	3.3
Other MH	605	208.4	513.3	176.8

Table 4: Gaps in Nonpediatric Psychiatric Visits in Washington State, 1998-1999

	Estimated Demand - Supply	1998 Washington State Population
Statewide	185,637	5,674,277
Urban:		
Overall	329,639	4,312,990
Seattle metropolitan area	349,270	1,835,094
Other metropolitan area	-19,631	2,476,439
Rural:		
Overall	-144,002	1,362,744
> 10K, adjacent	-39,309	484,304
> 10K, nonadjacent	-22,640	300,247
< 10K, adjacent	-40,249	287,811
< 10K, nonadjacent	-41,804	290,382

Figure 1. Distribution of Washington State Mental Health Professionals by Health Service Area, 1998-1999

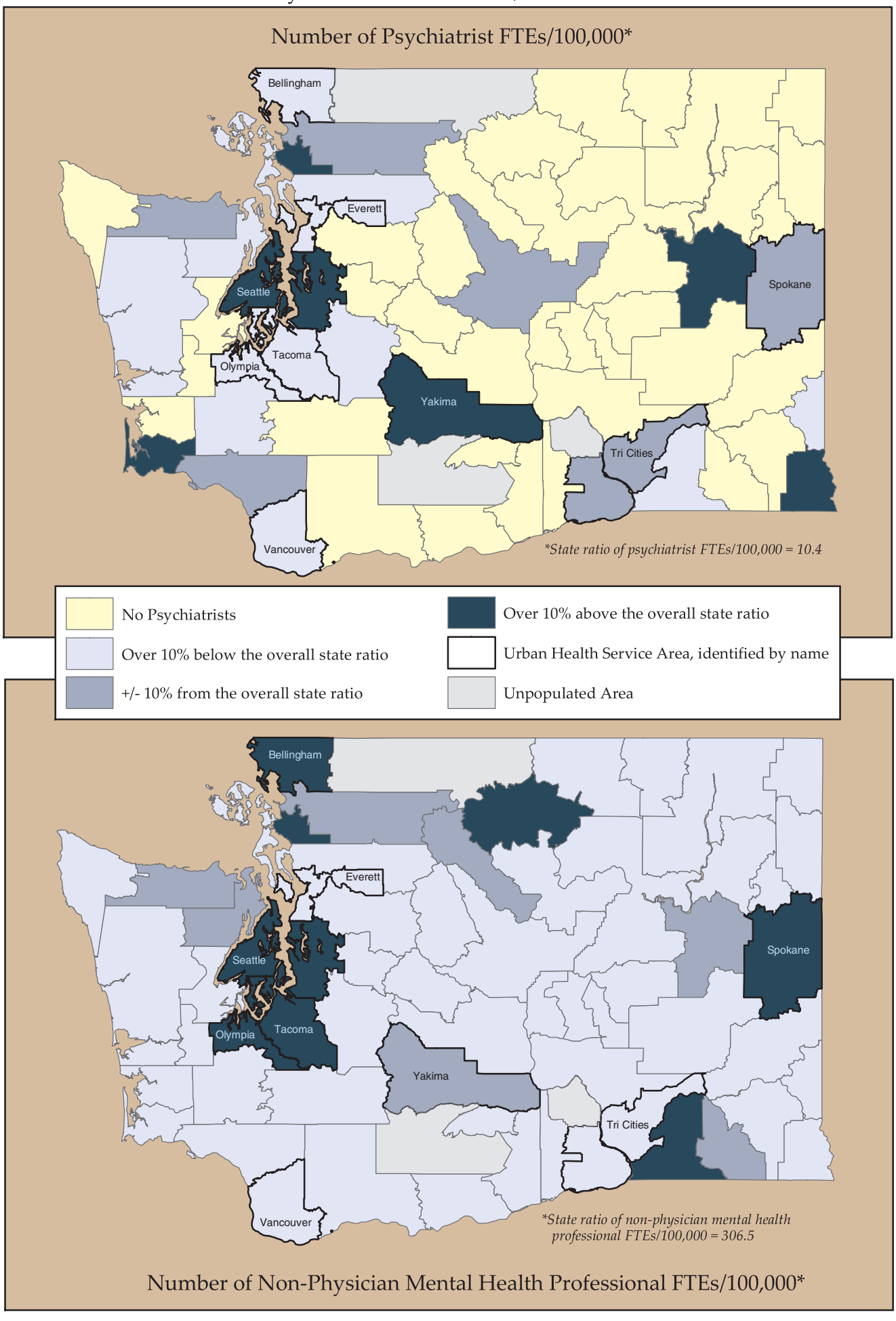
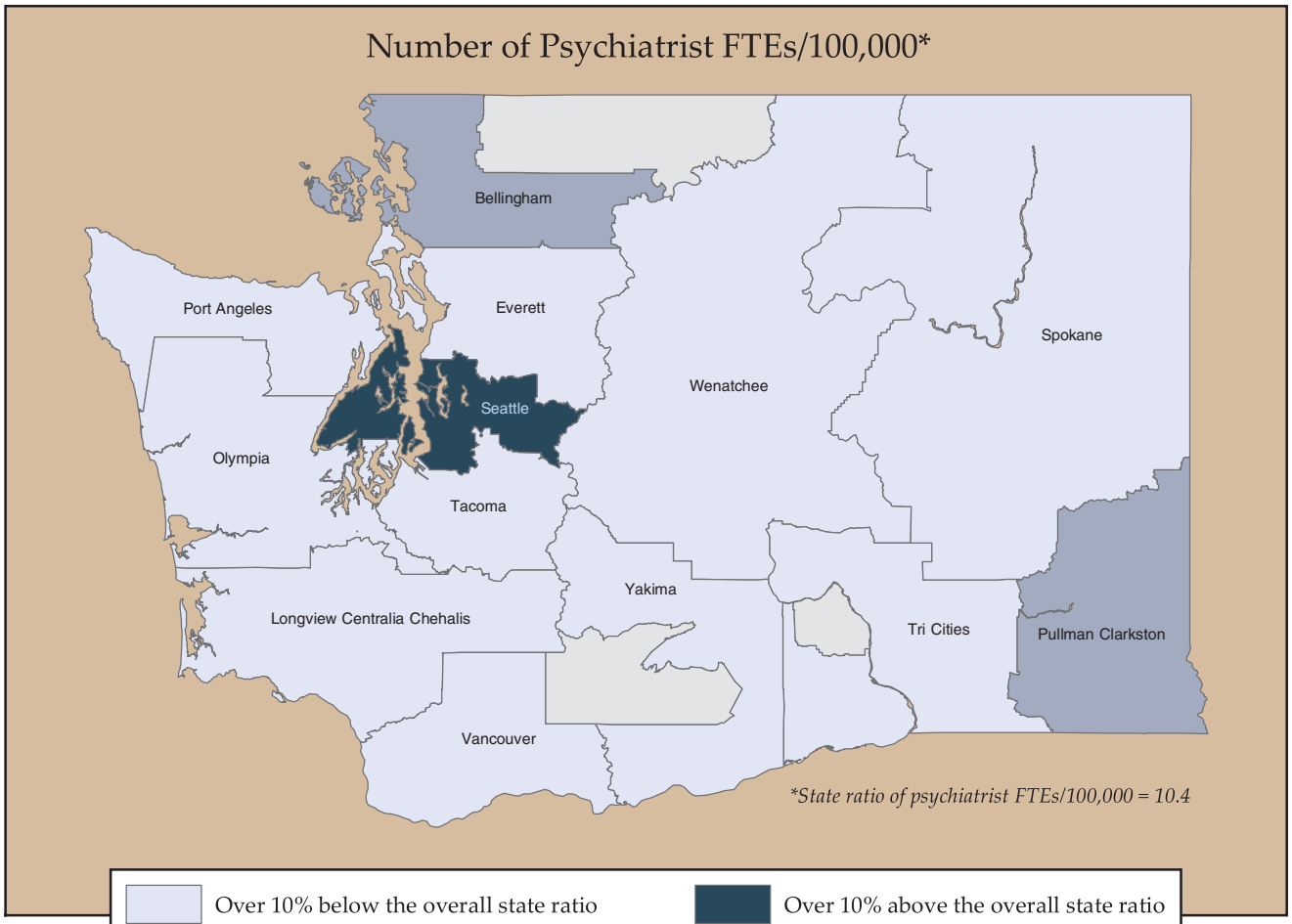


Figure 2. Distribution of Washington State Mental Health Professionals by Mental Health Region, 1998-1999



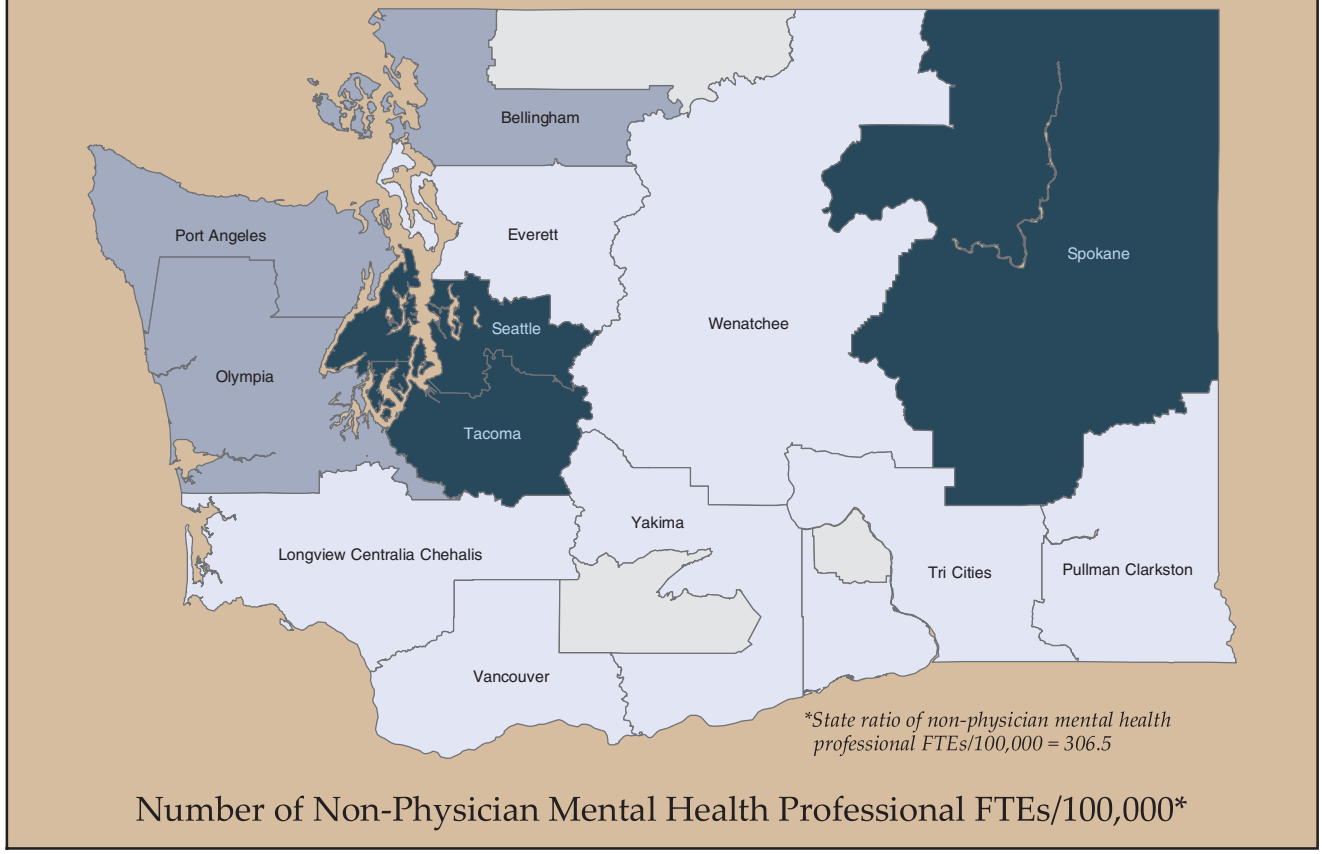
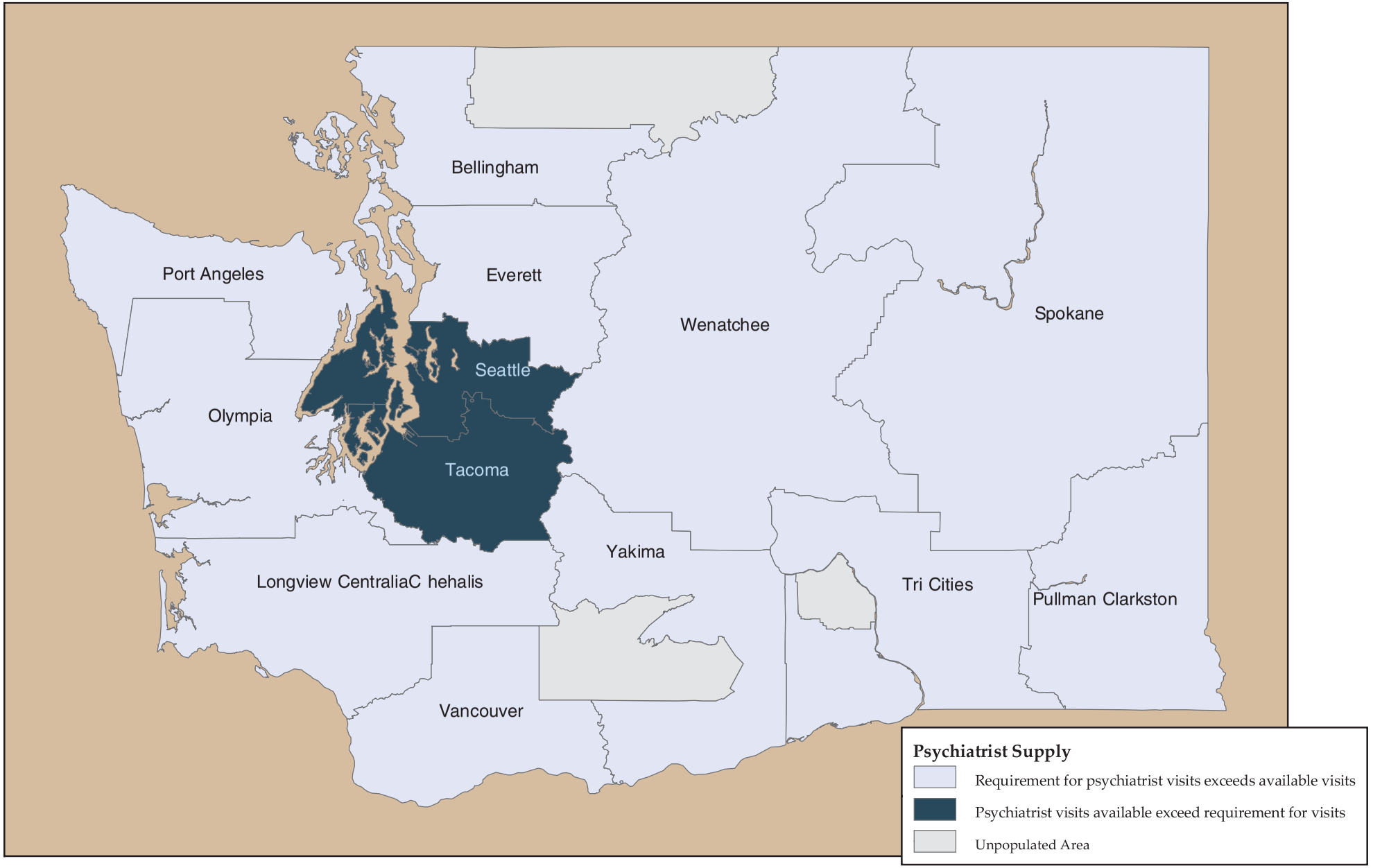


Figure 3. Balance Between Psychiatrist Visit Requirements and Supply in Washington State's Mental Health Regions



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