Mapping Our Way to Success: Wisconsin's Physician Workforce

Wisconsin Council on Medical Education & Workforce

2018 Healthcare Workforce Report


WISCONSIN

Mapping Our Way to Success: Wisconsin's Physician Workforce

Wisconsin Council on Medical Education & Workforce

2018 WCMEW Healthcare Workforce Report

George Quinn, WCMEW Executive Director
Richelle Andrae, WCMEW Program Analyst

Table of Contents

Tables

Graphs

Maps

Frequently Used Terms

AHEC Area Health Education Centers
APC Advanced Practice Clinician
APP Advanced Practice Provider
APRN Advanced Practice Registered Nurse
DHS Wisconsin Department of Health Services
DOA Wisconsin Department of Administration
FM Family Medicine Physician (or Specialty)
HPSA Health Professional Shortage Area, Administered by the Office of Primary Care
HRR Hospital Referral Region, Dartmouth Atlas
HSA Hospital Service Area, Dartmouth Atlas
MCW Medical College of Wisconsin
PCP Primary Care Provider
RUCA Rural-Urban Commuting Area
RWHC Rural Wisconsin Health Cooperative
TRIUMPH Training in Urban Medicine and Public Health (UWSMPH)
UWSMPH University of Wisconsin School of Medicine and Public Health
WARM Wisconsin Academy of Rural Medicine (UWSMPH)
WHA Wisconsin Hospital Association
WMS Wisconsin Medical Society
WHIO Wisconsin Health Information Organization

Acknowledgements

WCMEW would like to thank its partners for their guidance in development of this publication. First, WCMEW staff depended on the valuable input of a dedicated work group who provided ongoing consultation for the project. The work group includes:

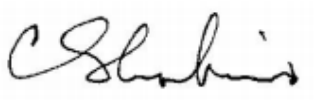
- Sandy Anderson, Ascension Wisconsin
- Tina Bettin, ThedaCare
- Bill Hueston MD, Medical College of Wisconsin
- Jaime Olson, Wisconsin Department of Health Services
- Tim Size, Rural Wisconsin Health Cooperative
- Peter Welch, Wisconsin Medical Society
- Paul Wertsch MD, Wildwood Family Clinic
- Ann Zenk, Wisconsin Hospital Association

Staff also sought support from the Wisconsin Office of Rural Health staff, specifically Penny Black, for their expertise on rural data analysis and visualization. The Wisconsin Office of Rural Health is responsible for developing the supply and demand maps in this report that allow for thoughtful discussion of geographic trends.

WCMEW is a collaborative of stakeholders in Wisconsin's health care workforce that includes representation from a broad range of organizations. Organizations continue to provide critical input around data needs, policy opportunities, and workforce collaborations. WCMEW members include:

- Medical College of Wisconsin
- Pharmacy Society of Wisconsin
- Rural Wisconsin Health Cooperative
- State of Wisconsin
- UW School of Medicine and Public Health
- Wisconsin Academy of Physician Assistants
- Wisconsin Area Health Education Centers (AHEC)
- Wisconsin Center for Nursing
- Wisconsin Hospital Association
- Wisconsin Medical Society
- Wisconsin Nurses Association

WCMEW staff is also appreciative of the health care organizations, educational institutions, and other partners that provided valuable insights regarding workforce successes and challenges. Thank you to the data partners that made this work possible, including the Wisconsin Medical Society (WMS) and Wisconsin Health Information Organization (WHIO). WCMEW appreciates the valuable contributions of workforce collaborators across the state and looks forward to engaging on future priorities together.



Dr. Charles Shabino
WCMEW Board Chair

George Quinn
WCMEW Executive Director

Executive Summary

This report is the latest in a series of publications focusing on the current and projected supply and demand for physician services in Wisconsin produced by the Wisconsin Council on Medical Education and Workforce (WCMEW). WCMEW's objectives are to assess Wisconsin's physician resources both today and in the future, develop and evaluate initiatives directed at ensuring the adequacy of those resources, and recommend solutions where appropriate.

New education and training programs have shown positive results in Primary Care Provider (PCP) expansion and retention across Wisconsin, leveraging noteworthy innovations in clinical training and in-state retention strategies. However, demand for PCPs, driven by an expanding and aging population, will outpace projected supply. To date, a largely uncoordinated approach to education and training has hampered a comprehensive solution to the impending problem of workforce shortages. Further, 40% of the current PCP workforce is expected to retire by 2035, a challenge which is compounded by other major demographic shifts. Provider gaps will be distributed unevenly across the state – with most regions experiencing significant deficits in future PCPs. Based on these conclusions, Wisconsin cannot expect to fill the demand for primary care through the physician workforce alone.

Report Goals and New Approach There are several differences between this report and those that have preceded it, such as WCMEW's 2016 publication, *A Work in Progress, Building Wisconsin's Future Physician Workforce*. Primarily, this report's focus is assessing regional differences for projected supply and demand of care across Wisconsin, highlighting maldistribution issues. Also, narrative in this report adds value by exploring the real-life experiences of workforce leaders, adding texture to data findings and insights. In this report, projections for future supply and demand focus on PCPs as these providers are critical in supporting population health.[1] The geographic units used for analysis of primary care are Hospital Service Areas (HSAs), which are local health care markets for hospital care, first defined in the Dartmouth Atlas.[2] Whereas WCMEW's 2016 report provided a statewide analysis of projected physicians needed based on various care delivery scenarios, this report does not make any attempt to analyze changing delivery scenarios.

Analysis This report first provides a profile of active Wisconsin physicians using data from the Wisconsin Medical Society. Projections for the supply of PCPs into the year 2035 are made by analyzing additional supply of physicians from medical schools, Graduate Medical Education (GME) training, and recruitment. Physicians leaving practice due to dissatisfaction, relocation, or retirement are then included in estimates. Estimates also include lifestyle changes, accounting for a trend of fewer hours worked by younger physicians compared to those in older age cohorts.[3] Projections include the Department of Health Services (DHS) GME grant programs, UW's Wisconsin Academy of Rural Medicine (WARM) Program, and the Medical College of Wisconsin's two new campuses in Green Bay and Wausau. The projected results of these programs are displayed in Table 1 – which highlights projected results of state investments.

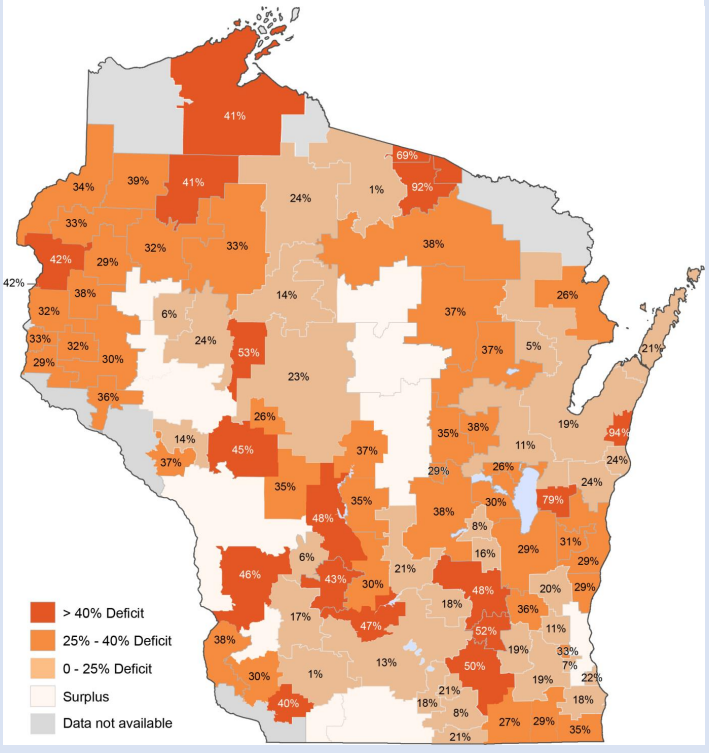
[1] Phillips, Robert and Bazemore, Andrew. *Primary Care and Why it Matters for U.S. Health System Reform*. Health Affairs, 2010.
[2] The Dartmouth Atlas is initiative of the Dartmouth Medical School conducting research into health care cost and utilization issues nationwide.
[3] *The Complexities of Physician Supply and Demand, 2018 Update*. Association of American Medical Colleges, 2018.

Table 1: Projected Investment in Physician Development, Year 2035		
	Current Total FTE Physicians	**4,373**
Physician Production	WI Medical Schools	666
	Traditional GME Programs	1,182
	WARM and MCW Community Campuses	309
	New and Expanded GME Programs	156
	Turnover (in/out-migration, recruitment)	404
Physician Reductions	Retirements	(1,934)
	Lifestyle Changes	(615)
	Projected for 2035	**4,541**

Demand projections are made by applying statewide averages for physician service utilization from WHIO, the Wisconsin Health Information Organization. WHIO collects paid insurance claims information from millions of residents across the state, and actual services from paid claims were used as a proxy for demand for physician services. These utilization averages, based on age and gender, were applied to population data from the Wisconsin Department of Administration (DOA) for both current and projected populations across Wisconsin counties, which were then attributed to HSAs. Current assessment of physician shortages is based on a 50 PCP per 100,000-population ratio for each HSA, which serves as the baseline for change in demand for physician services.[4]

Findings Overall, demand for primary care is projected to increase by 20.9%, although there is wide variance among HSAs, ranging from 3.9% to 39.7%. Total population increases, together with an aging population, are drivers of increases in demand. Primary care supply and demand projections are compared in this report, showing surpluses or deficits for each HSA. Statewide, there is a projected shortfall of 745 FTE PCPs, or 14% compared to overall supply. Wide variance among HSAs is evident, ranging between a surplus of 24.4% and a deficit of 93.7% – as indicated in the map to the right. Dark orange areas indicate highest unmet need. Rural communities are expected to see the greatest percentage deficits, whereas metro areas can expect the greatest total FTE deficits. Data shows that while the population is expected to increase 12% statewide, demand is expected to increase by over 20%. Supply of PCPs is projected to increase by approximately 4%.

Projected Primary Care Physician Deficits, Percent of All Unmet Need (Year 2035)



[4] WCMEW also uses Health Professional Shortage Area (HPSA) data to account for a shortage of providers in the Milwaukee area, which is not accounted for in the large geographic Milwaukee HSA. Further discussion is provided in the body of this report.

Though medical schools and GME programs will produce over 2,300 PCPs, retirements and expected lifestyle changes in the workforce will effectively reduce total PCPs by over 2,500 FTEs.

Rural areas are expected to experience the highest percentage PCP deficits, but those regions may be adequately served by only a few additional PCPs to serve relatively small populations. Rural areas traditionally have fewer resources at their disposal to recruit and retain physicians, and will need to continue seeking creative approaches to best use their scarce physician resources.[5] Urban and suburban HSAs facing shortfalls will have more resources to recruit or otherwise produce sufficient PCPs to meet their needs, but will also need to recruit and retain the largest physician workforce, as would be expected for Wisconsin's largest cities.

Data indicates that 82.5% of Wisconsin's total physicians are located in Metropolitan areas, whereas 71% of Wisconsin's population is located in Metropolitan areas. Conversely, less than 10% of Wisconsin physicians practice in rural areas, whereas nearly one-fifth of the population is in small towns or rural communities. Statewide, the PCP workforce is projected to increase by 3.8%, but the projected increase from medical schools, GME programs, and turnover are largely offset by retirements of current physicians and lifestyle changes of young physicians. Noteworthy are retirements; nearly 40% of currently working PCPs are projected to retire by 2035.

Insights from Health Systems and Educators Conversations with health systems and educators across Wisconsin helped expand on WCMEW's data findings – broadening the conversation beyond the physician workforce. Leaders expressed various challenges and successes in recruitment and retention of providers in rural communities, and a wide range of experiences incorporating Advanced Practice Clinicians (APCs) into patient care. Leaders shared their insights regarding:

- Utilizing team-based care initiatives and integrating APCs while navigating complex regulatory policies and guidelines;
- Value of proactive workforce planning that can help systems prepare for growth and changing care delivery patterns;
- Concerns regarding the need for greater integration of students into clinical settings, including resources needed for coordination, ensuring high-quality student experiences amidst growing competition for clinical sites.

Recommendations Based on data findings and conversations with stakeholders, WCMEW has provided recommendations for policymakers, health systems, and educators.

Continued Emphasis on Infrastructure and Long-Term Planning

Proactive, data-informed decision-making is critical at health systems, government levels, and educational institutions. Several programs are showing early results that warrant continued investment. At the same time, these programs must be responsive to emerging issues in underserved areas. Further, a longer-term perspective is needed in workforce development.

1. **Continue to fund programs that invest in infrastructure development and training**. Target current and projected underserved geographic areas (identified in this report) to prioritize

[5] *Keeping Physicians in Rural Practice*. American Academy of Family Physicians, 2014.

workforce development in underserved areas. Infrastructure programs must also be flexible to emerging demands for financing of housing, travel, and other barriers.

2. **Expand and increase coordination of clinical training sites.** Along with the funding for program development, efforts should be made to ensure an adequate number of clinical training sites, including the necessary resources such as faculty and preceptors. In addition, systems and procedures should be implemented to better coordinate clinical placements to ensure that these limited resources are appropriately utilized.
3. **Expand rural and underserved programs by recruiting students likely to stay.** Programs with a rural or underserved focus should continue to prioritize recruiting students likely to dedicate their practice to underserved areas. Educational institutions must commit resources to assessment of application and admissions processes to ensure policies support desired outcomes.
4. **Build workforce into strategic planning processes**. Workforce priorities should be integrated into all elements of strategic planning to enable long-term workforce viability and investment. Share best practices regarding what is working well regarding planning, and where improvement is needed.

Collect and Leverage Data for Decision-Making

To accurately assess workforce trends and implications across Wisconsin, more data is needed in several areas to ensure relevant and timely evaluation of workforce issues.

5. **Develop comprehensive APC workforce data.** While there is significant data available on the physician and nursing workforces, an insufficient data infrastructure exists for APCs – and data is not integrated or comparable across provider types. Understanding the current demographics and geographic distribution of APCs is critical to assessing care models and implications. WCMEW should create a database to facilitate the modeling of future supply and demand, assessing distribution across clinicians and regions.
6. **Best practices and outcomes for team-based care must be identified.** Outcomes may include patient health, cost-saving, provider burnout level, and other indicators. Effective models must be shared across care settings, geographic regions, and specialties to ensure that all members of the workforce are being most effectively utilized.
7. **Track data longitudinally to ensure accurate analysis of program reforms and expansions.** New medical school expansions and GME funding have contributed to significant advances of provider training across Wisconsin. However, sufficient data is not available to track long-term outcomes. Assessing rationales for relocating or leaving practice must also be tracked to evaluate decision-making processes and ensure incentives align with desired outcomes.
8. **Develop methods to assess distributions of populations and providers across regions that most accurately reflect patient access to care, given current imperfect current geographic units.** This report utilizes Health Service Areas for patient and provider data, but using transportation patterns or other methods may more accurately reflect real care delivery trends.
9. **Explore and identify which providers in Wisconsin will be most needed for the state's aging population.** Today, priority for grant funding and other development projects is given for primary care, but tomorrow's patient population may require providers such as gerontologists to meet the needs of an aging population.

Report Objectives and Rationale

The Wisconsin Council on Medical Education and Workforce (WCMEW) was originally formed in 2004 as a response to a report that predicted a future shortage of health care practitioners and called for action to address it. Since its inception, WCMEW has served as a convener and platform for highlighting health care workforce issues, working across clinicians, care delivery sites, educators, and policymakers to raise developing concerns and devise collaborative solutions.

WCMEW also seeks to prepare decision-makers with timely, high-quality data on workforce needs in Wisconsin to ensure our leaders have the information they need to design effective policy – always with a focus on planning for the future. WCMEW was also tasked with advancing Wisconsin's health care workforce strategic plan after collaborating on the National Governor's Association Healthcare Workforce Policy Academy in 2016.

This report provides a snapshot of Wisconsin's physician workforce, along with a forecast for primary care physician (PCP) supply and demand in the year 2035. The publication builds on WCMEW's previous report, *A Work in Progress: Building Wisconsin's Future Physician Workforce*, which provided projections for Wisconsin overall. The 2016 report projected a range of shortages of between 883 and 3,756 Wisconsin physicians by 2035, considering various supply and demand scenarios.[6]

It is imperative to highlight localized workforce data so that policy can be adopted to best support workforce developments in regions with the highest need.

Statewide figures are useful in assessing net progress in workforce development, particularly related to advancing opportunities for Graduate Medical Education (GME) and assessing the impact of various delivery models such as team-based care and telehealth. However, significant variance exists across Wisconsin's regions and is not captured in statewide estimates. Therefore, it is imperative to highlight localized workforce data so that policy can be adopted to best support workforce development in regions with the highest need.

This report's focus is the physician workforce, a relatively small subset of clinicians. It is also important to note that the projections in this report focus on PCPs, not on the entire physician workforce. Future publications will address other specialties – and assess inter-related issues with a broader spectrum of clinician groups. Data presented in this report can serve as a starting point for discussing implications related to hundreds of thousands of health care providers across the state.

Along with supply and demand data, this report also showcases best practices and challenges faced by leaders across Wisconsin who make difficult workforce decisions every day. WCMEW aims to show how creative, collaborative leaders across health care can work together to address workforce needs holistically, with long-term viability as a priority. As in the past, this report will conclude with recommendations on how Wisconsin can address future shortages of primary care providers.

[6] WCMEW's complete 2016 report is available online at www.wcmew.org.

Recommendations will take a broad view of what actions healthcare leadership, policymakers, and training institutions can take in tackling these issues.

History and Progress Significant progress has been made by Wisconsin's policymakers through study, analysis, and investment in today's workforce needs. For example, advances have been made due to state funding of Advanced Practice Clinician (APC) training and GME grants, and through continued financial support of programs such as the Wisconsin Rural Physician Residency Assistance Program (WRPRAP) which provides support for developing rural training opportunities.

Similarly, educational institutions are dedicated to developing innovative approaches to student training, such as the Medical College of Wisconsin's critical expansion into the Wausau and Green Bay areas, and the University of Wisconsin – Madison's Wisconsin Academy or Rural Medicine (WARM) and Training in Urban Medicine and Public Health (TRIUMPH) programs. Additional investment is evident in partners from hospitals and health systems across the state that work to integrate students for clinical training, invest in care delivery re-designs that best utilize the current workforce, and develop clinician retention strategies to keep Wisconsin's workforce engaged. While these activities (along with many more initiatives around the state) support necessary workforce development, more can be done.

For the first time, health care has recently become the U.S.'s largest workforce – and has long been a key economic driver.[7] Workforce members are critical to sustaining Wisconsin communities, measured via economic indicators of jobs, economic activity, wages and benefits, and state and local tax revenue.[8]
But most importantly, a sufficient workforce is critical to ensuring patient access to care. Previous reports by WCMEW, the Wisconsin Hospital Association (WHA), Wisconsin Medical Society (WMS), Wisconsin Area Health Education Centers (AHEC), Wisconsin Department of Health Services (DHS) and others highlight provider shortages and impacts on patient care.

Data focuses on physicians, but WCMEW's intention is that health care leaders in HR, Administration, and other areas will further explore the relationship between the physician workforce and NPs, PAs, Pharmacists, Nursing, Allied Health, and all other critical clinicians.

Maldistribution Lack of providers in certain geographic areas and specialties has been a theme throughout these reports, and policymakers seek to address these issues by incentivizing development in rural and inner-city (underserved) communities. However – there are few resources that illustrate detailed regional variance in workforce needs. The DHS Office of Primary Care develops Wisconsin's Health Professional Shortage Areas (HPSAs), which indicate the current number of physicians needed to remove federal shortage designations.[9] However, WCMEW is the only organization in the state that seeks to develop *projections* regarding physician shortages *across Wisconsin regions*.

Data in this publication will focus on physicians, but WCMEW's intention is that health care leaders in Human Resources, administration, and other areas will further explore the relationship

[7] Thompson, Derek. *Health Care Just Became the U.S.'s Largest Employer*. The Atlantic, 2018.
[8] *The Economic Impact of Physicians in Wisconsin*. The American Medical Association, 2018.
[9] *Number of Providers Needed: Primary Health Care*. Wisconsin Office of Rural Health and DHS, 2018.

between the physician workforce and Nurse Practitioners (NPs), Physician Assistants (PAs), Pharmacists, Nursing, Allied Health workers, and all other critical clinicians. Narratives included throughout the report will further serve to connect the physician and non-physician workforces, supporting a broader discussion around strategic, integrated workforce planning.

Approach to Analysis WCMEW used two primary data sources for its analysis of the Wisconsin physician population. The first is a database of active Wisconsin physicians from the Wisconsin Medical Society, used for supply estimates.[10] WCMEW used Wisconsin Health Information Organization (WHIO) data for patient care for its demand analysis.[11] With these basic datasets established, WCMEW conducted additional analysis to attribute Full Time Equivalent (FTE) to physician supply and determine average utilization rates by specialty type. To arrive at FTE counts, WCMEW applied average FTE status by age and gender to all individual physician providers.[12]

This method accounts for two trends in provider lifestyle changes which are evident in today's physician population. The first is that younger physicians, on average, work fewer hours per week than older physicians, and the average total hours worked as been declining for decades (5.4 fewer hours worked on average per week in 2010, compared to 1980).[13] The second factor FTE status accounts for relates to gender, as female physicians work fewer hours on average than male physicians.[14] A complete discussion of FTE equivalent methods and other limitations are available in Appendix III.

This approach accounts for two trends in provider lifestyle changes, including fewer hours worked, on average, for younger physicians and for women in the medical field.

This report will first provide physician demographic data, such as age and gender, along with data on specialty, location of medical school training, and residency in the *Physician Profile* section. Current supply and projections for primary care will use Hospital Service Areas (HSAs) as the geographic unit. HSAs are local health care markets for hospital care, and were first defined in the Dartmouth Atlas, an initiative of the Dartmouth Medical School conducting research into health care cost and utilization issues. An HSA is a collection of ZIP codes whose residents receive most of their hospitalizations from the hospitals in that area. Comparisons of specialty physicians to population will be made according to Hospital Referral Regions (HRRs), which are aggregations of HSAs into tertiary care regions.[15]

[10] While this database is primarily used for membership purposes, it includes data on primary physician practice location, residency location, gender, age, and specialty. The database is updated continuously, and retired or inactive physicians are removed.

[11] This dataset incorporates medical care usage for commercial insurance, Medicaid, and Medicare populations, reflecting state-specific utilization rates.

[12] *Primary Care Physicians, Wisconsin AHEC Workforce Data Brief*. Wisconsin AHEC, 2015.

[13] *A Work in Progress: Building Wisconsin's Future Physician Workforce*. Wisconsin Council on Medical Education and Workforce, 2016.

[14] *Primary Care Physicians, Wisconsin AHEC Workforce Data Brief*. Wisconsin AHEC, 2015.

[15] Primary care service areas (PCSAs), compiled by the Dartmouth Atlas, were also considered, and subsequently WCMEW determined that disaggregated data was not available at a level to allow for PCSA-level analysis at this time. Using HSAs in evaluating access to care is a more meaningful framework than, for example, county demarcations, which represent political boundaries.

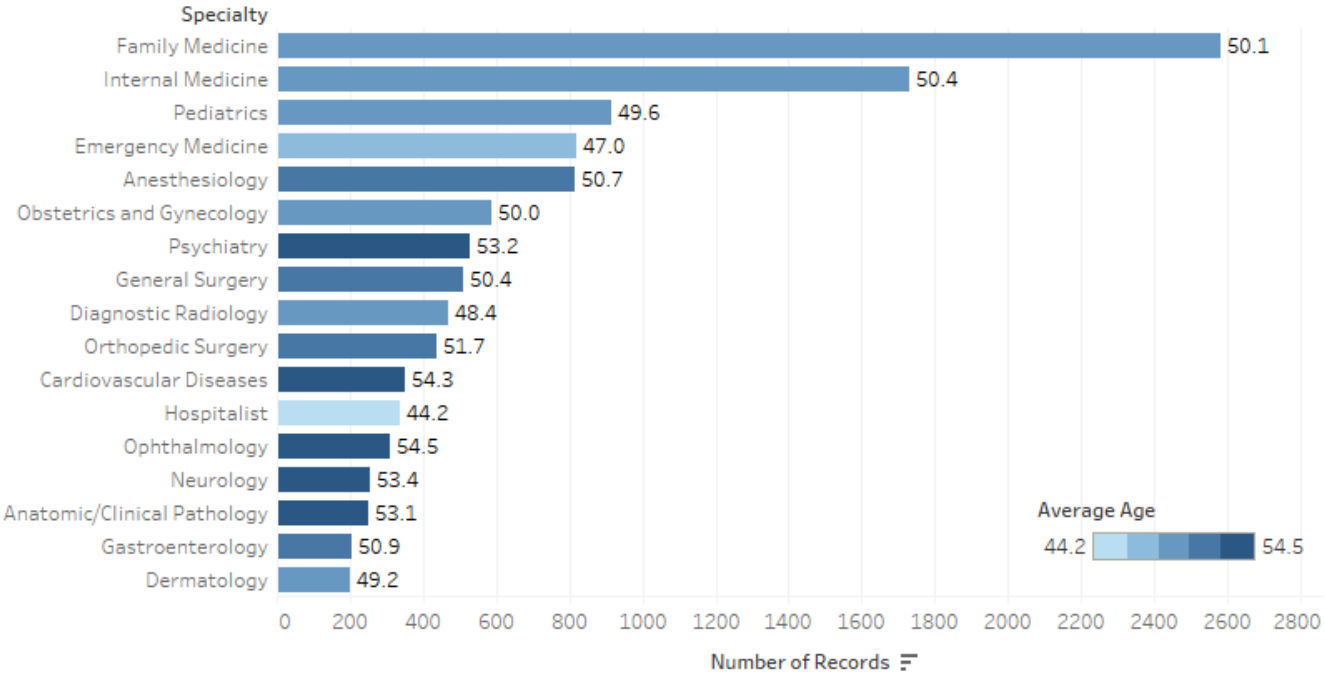
Wisconsin Physician Profile

In this section of the report, WCMEW presents figures for the current population of Wisconsin physicians. Understanding shifts in physician demographics can help policymakers, educators, and health systems plan for recruitment needs, specialty shortages, and necessitate expanded training opportunities. Data presented in the Physician Profile, along with assumptions and limitations, are further discussed in Appendix III.

34.3% of all Wisconsin physicians are over the age of 55.

Physician Age and Specialty Average age by specialty ranges from 55.4 years for Radiology to 44.1 years for hospitalists. In all, 34.3% of all Wisconsin physicians are over the age of 55, making physicians older than every provider type other than Licensed Practical Nurses.[16] Average age varies across specialty groups, as indicated below.

Graph 1. Average Age, by Specialist (All Specialties with Over 200 Current Wisconsin Physicians)



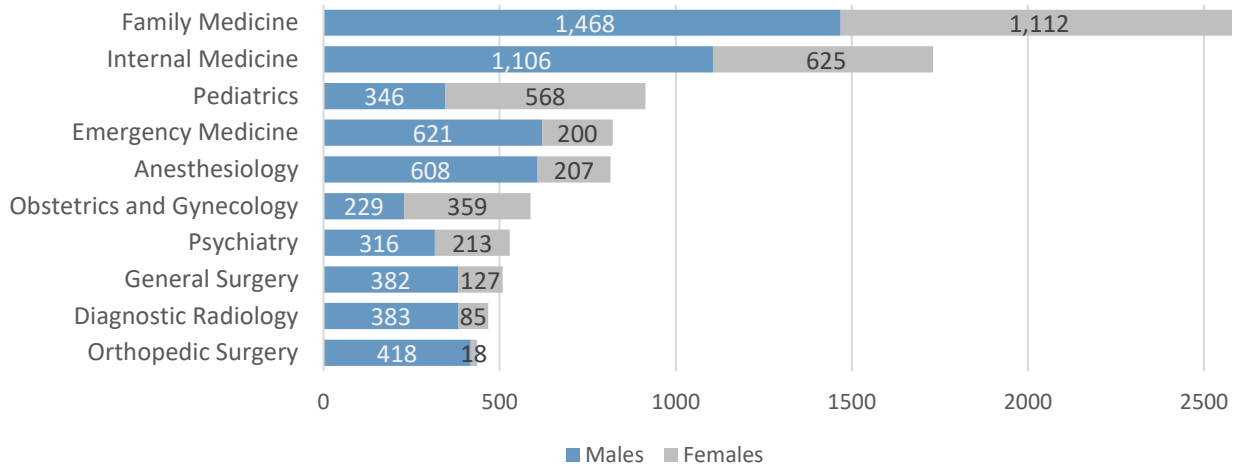
Data Source: WCMEW analysis of WMS physician database.

For this report, PCPs include Family Medicine, Internal Medicine, Pediatrics, General Medicine, and other General practice physicians as detailed in Appendix VII, according to Association of American Medical Colleges standards. All other physicians are considered Specialists in this report, with subcategories of Medical Specialties, Surgical Specialties, and All Other Specialties. Behavioral Health physicians are also considered non-Primary Care physicians in this report, and are considered separately in Appendix VI. An ongoing discussion continues regarding whether or not to consider Psychiatrists as PCPs, and therefore WCMEW has opted to exclude Behavioral Health physicians from either group at this time.

[16] Wisconsin Hospital Association 2016 Hospital Personnel Survey

Top Specialty Areas with Gender Considering gender makeup of each specialty area helps identify specialties that will be especially impacted by changing physician demographics, including more women entering the medical field. Family Medicine, Internal Medicine, and Pediatrics are the largest physician groups, accounting for over one-third (36.4%) of all Wisconsin physicians. While Family Medicine and Pediatrics are currently nearly split between genders, all other specialties are male-majority, which is expected to change as physicians retire. Current matriculation for medical schools is majority-female, with women accounting for 50.7% of new enrollees in 2017.[17] According to the Association of American Medical Colleges (AAMC), since 2015, female matriculation has grown by nearly 10%, with male enrollment declining by 2.3% in the same time period. The chart below illustrates the top 10 Wisconsin specialties, with gender distribution in each specialty.

Graph 2. Current Wisconsin Physicians, by Age and Gender (Top 10 Specialties)



Data Source: WCMEW analysis of WMS physician database.

Training location There is a strong correlation between location of a physician's education and training, and where they ultimately practice. This data indicates that completing education and residency in Wisconsin is a stronger predicter for practice in Wisconsin compared to attending one of Wisconsin's medical schools alone.[18] Data below shows medical school and GME location for current Wisconsin physicians – a complimentary data point to retention rates for all Wisconsin medical school graduates.

Table 2: In-State Retention Indicators

Indicator	**Percent Currently Practicing in WI**
Graduated from a WI Medical School	37%
Graduated from a WI GME Program	46%
Graduated from both a WI Medical School and a WI GME Program	70%

Data Source: WCMEW analysis of WMS physician database.

[17] *More Women Than Men Enrolled in U.S. Medical Schools in 2017*. AAMC News, Association of American Medical Colleges, 2017.
[18] *State Physician Workforce Data Report*. Association of American Medical Colleges, 2017.

The following table shows the top five medical schools and top five residency programs attended by *currently active* Wisconsin physicians. Patterns are evident in the production of Wisconsin physicians by Midwest institutions and health care systems.

Table 3: Top Producers of Current WI Physicians, by Medical School and Residency or Fellowship Location

	Medical School	Total WI Physicians	**Residency or Fellowship Location**	Total WI Physicians
1	University of Wisconsin	2,243	Medical College of Wisconsin Affiliated Hospitals	1,976
2	Medical College of Wisconsin	2,110	University of Wisconsin Hospitals and Clinics	1,633
3	University of Illinois College of Medicine	530	Mayo Rochester	214
4	University of Minnesota Medical School	405	University of Iowa Hospitals and Clinics	214
5	University of Iowa College of Medicine	334	Aurora Health and /or St. Luke's Medical center	372

Data Source: WCMEW analysis of WMS physician database.

Geographic Classification and Specialty Type Understanding not only statewide figures for physician data but disaggregating by geographic category illustrates significant patterns by location and specialty type and a mismatch between population location and providers. This report uses Rural-Urban Community Area (RUCA) categories for analysis, with additional information available in Appendix IV.[19] The table below shows average age and location for Wisconsin physicians by specialty type and by geographic category.

Table 4. Average Age, All Wisconsin Physicians, by Geographic Category (RUCA Code) and Specialty Type

	Metropolitan	**Micropolitan**	**Small Town / Rural**
Average Age	50.0	50.8	52.5
Total Physicians in Area	11,844	1,264	1,236
Physician Population	82.5%	8.8%	8.6%
Total WI Population	71%	11%	18%

	Behavioral Health	**Primary Care**	**Medical Specialties**	**Surgical Specialties**	**All Other Specialties**
Average Age	52.5	50.1	50.6	51.5	49.2
Total Physicians in Specialty	667	5,377	2,016	2,658	3,635
% of All Physicians	4.6%	37.5%	14%	18.5%	25.3%

Data Source: WCMEW analysis of WMS Physician database and DOA population data.

[19] *Rural-Commuting Area Codes (RUCAs).* Rural Health Research Center, 2018.

Data indicates that 82.5% of Wisconsin's total physicians are located in Metropolitan areas, whereas 71% of Wisconsin's population is located in Metropolitan areas. Conversely, less than 10% of Wisconsin physicians practice in rural areas, whereas nearly one-fifth of the population is in small towns or rural communities. Behavioral health providers are the oldest specialty group, followed by surgical specialists. Small town and rural physicians are also on average 2.5 years older than metropolitan physicians.

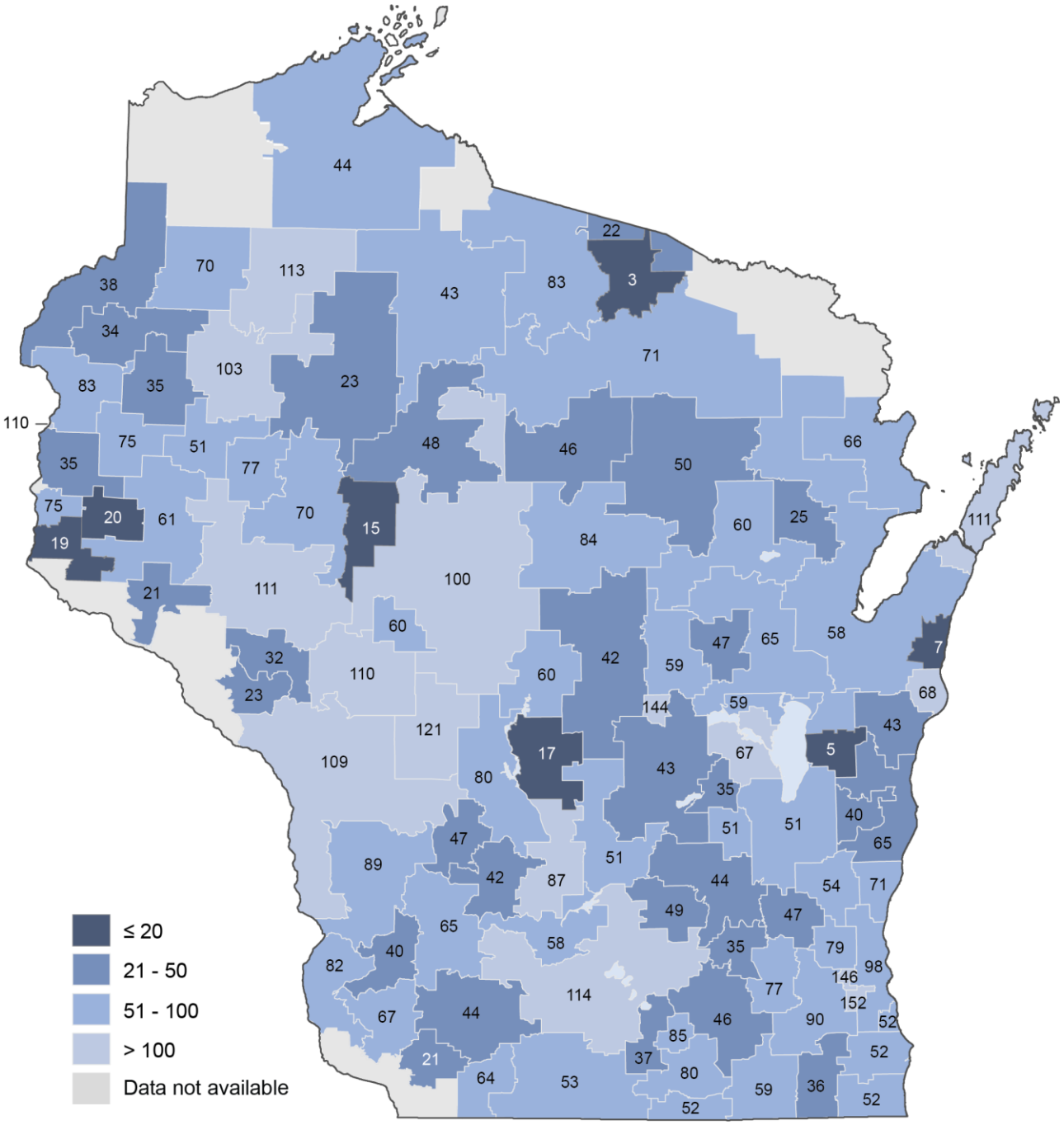
Current Physician Distribution and Need This report provides maps showing provider patterns across Wisconsin's Hospital Service Areas (HSAs) for primary care and behavioral health physicians, and Hospital Referral Regions (HRRs) for specialists. The map below shows the primary metro, suburban, or rural area for each of Wisconsin's HSAs. The map should be used in reference to the subsequent maps displayed, and full data available in Appendix V.

Map 1: Wisconsin Hospital Services Areas (HSAs)

Data Source: Dartmouth Atlas Hospital Service Areas.

The map below shows the ratio of PCPs per 100,000 population for each HSA. Grey areas indicate regions where the hub for hospital care is located across state lines; data is excluded from these regions. For total population to PCP ratios, the statewide average is 75.6 PCP per 100,000 population. However, the median figure is 56, showing considerable variance across the state.

Map 2. Primary Care Physician FTE to Population Ratio (Per 100,000 Population), by HSA



Data Source: WCMEW analysis of WMS physician database and DOA population

The table below shows the top and bottom HSAs, based on concentration of PCPs, illustrating the breadth of physician concentration across Wisconsin regions.[20] Metropolitan and suburban areas see the highest (most favorable) PCP to population ratio, whereas small towns and rural areas see the lowest (least favorable) ratio.

Table 5. Primary Care Providers by Hospital Service Area, Highest and Lowest Concentrations

Region	PCPs per 100,000 Population	Region	PCPs per 100,000 Population
West Allis	152.1	Eagle River	3.1
Brookfield	146.1	Chilton	5.3
Madison	113.6	Kewaunee	7.4

Data Source: WCMEW analysis of WMS physician database and DOA population data.

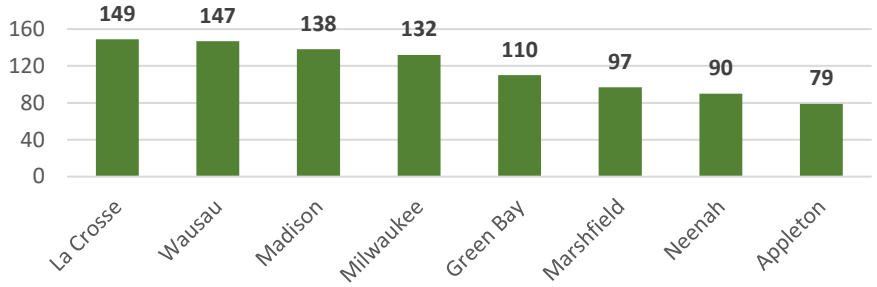
This analysis uses a baseline of 50 PCPs per 100,000 population to compare providers across Wisconsin's HSAs. Research ranges for optimal ratios, and WCMEW selected an approximate median figure for comparison purposes – though this figure does not serve to provide a *recommended* ratio. Rather, using this threshold allows apples-to-apples comparisons across regions to develop a baseline. Appendix V illustrates the FTE physicians needed to reach the 50 PCP per 100,000 population ratio in each region.

As HSA units are aggregates of zip codes, they will not identify HPSAs that are "embedded" within them. The most obvious example is Milwaukee. Patterns of care delivery and access are particular to Milwaukee, compared to most other Wisconsin regions. While there are over 845 FTE located in Milwaukee (nearly 20% of all Wisconsin PCPs), demographic and poor health outcomes are clustered in areas across Milwaukee county, signaling different patters of healthcare access.[21] For that reason, the Milwaukee area HSA is specifically identified in maps to note that patterns of access within the HSA itself may have considerable variation.

Specialist Providers Specialists are not discussed in depth through this report, but basic information is provided to show geographic patterns. Specialist categories include all non-primary care medical, surgical, and all other specialties, excluding behavioral health. Note that the HRR in Western Wisconsin, near St. Paul and Rochester, has a low physician to population ratio. However, that is because physician practices are presumably located across the state border in Minnesota, for which practice data is not comparable. The HRR for that region is based in Minnesota, and Wisconsin residents in this HRR likely receive much of that care out of state for specialists than they do in-state. The same is true of three additional HRRs, whose specialist hubs are located outside Wisconsin, including the HRRs representing Dubuque (Iowa), Minneapolis (Minnesota) and Duluth (Minnesota). Therefore, only the regions based entirely in Wisconsin are compared in the graph and map below.

[20] Tomah is the site of a large Veterans Administration facility, serving veterans, so not included here.
[21] *Community Health Assessment, 2015-2016*. City of Milwaukee, 2017.

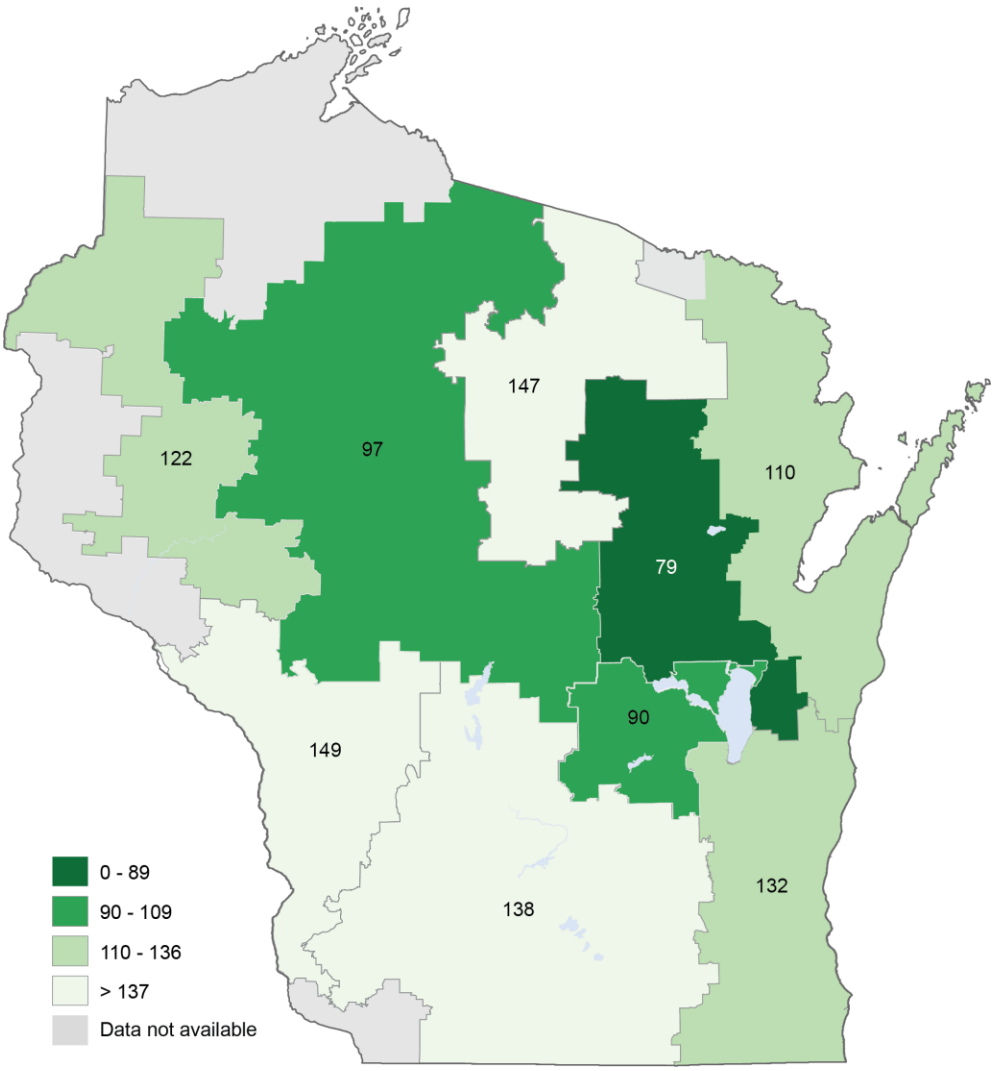
Graph 3. Specialty Physicians Per 100,000 Population



Data Source: WCMEW analysis of WMS physician database and DOA population data.

The following map illustrates specialty physicians per 100,000 population across Wisconsin HRRs, as compared in the graph above.

Map 3. Specialty Physicians per 100,000 Population, by Hospital Referral Region (HRR)



Data Source: WCMEW analysis of WMS physician database and DOA population data.

Primary Care Physician Forecast

The preceding section provides a profile of the current Wisconsin physician workforce, and gives an overall picture of current supply, across specialties. However, WCMEW's focus in this report will be PCPs. Primary Care has been identified as an area of particular need, and the scoping also allows for a more discrete analysis with specific policy recommendations. Future reports will assess other specialty types, or other provider types.

Family Physician Demographics Family Physicians are the largest specialty group, approximately one-fifth (18%) of all Wisconsin physicians. The demographic makeup (age and gender) of Wisconsin's FPs is illustrated below in Table 7.

Table 6: Family Physicians, Wisconsin Demographics

	Female		**Male**		**Total**	
Age	**Total**	**% in Age Group**	**Total**	**% in Age Group**	**Total**	**% in Age Group**
34 and under	134	12%	89	6%	223	9%
35 – 39	192	17%	113	8%	305	12%
40 – 44	178	16%	143	10%	321	12%
45 – 49	204	18%	202	14%	406	16%
50 – 54	156	14%	202	14%	358	14%
55 – 59	127	11%	211	14%	338	13%
60 – 64	89	8%	304	21%	393	15%
65 – 69	25	2%	153	10%	178	7%
70 – 74	4	0%	37	3%	41	2%
75 and over	0	0%	11	1%	11	0%
Total	**1,109**	**100%**	**1,465**	**100%**	**2,574**	**100%**

Data Source: WCMEW analysis of WMS physician database.

The average age of Family Physicians (FPs) is 49.3, lower than the overall average of 52 in Wisconsin's total physician workforce. Also noteworthy are gender differences, both in the total make up of FPs (illustrated above, FPs show a significantly higher percentage of females), and in the relative ages of males and females in the FP population. 45.4% of female FPs are under the age of 45, compared to only 23.5% of males. Furthermore, 60% of all FPs aged 34 and under are female, suggesting that the future FP workforce is likely to be predominately female.

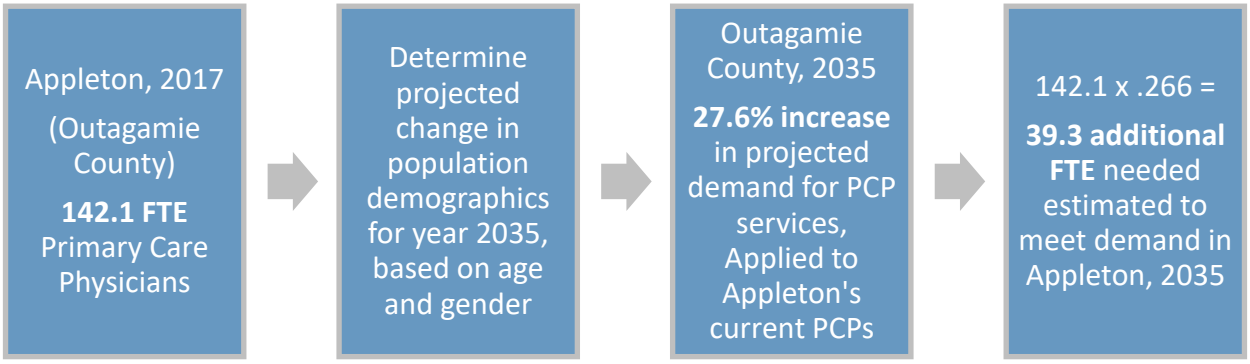
45.4% of female Family Practice (FP) physicians are under the age of 45, compared to only 23.5% of males. This suggests that the future FP workforce is likely predominantly female.

These factors are important to understand for projections because of the differences in the number of patients seen across two demographic characteristics: between male and female physicians, and between younger and older physicians. The average hours worked by female physicians is, on average, about 10% lower than male physicians; and younger physicians, on average, work about 7% fewer hours than those

over the age of 50.[22] The proportion of female FPs (and other PCPs) is expected to become higher in the future, based on the data above. Therefore, since historically females have worked fewer hours than males, the number of physicians needed to meet demand must increase at a greater rate than what increases in patient demand alone would dictate.

Demand To project demand for primary care, WCMEW applied projected changes in statewide averages for physician service utilization, using WHIO utilization data as the proxy, to the populations of Wisconsin HSAs. Population demographics (age and gender) are not available for individual zip codes, but are available for counties. Therefore, WCMEW determined the majority-county for each HSA and applied the projected change in required primary care physician services to the zip code's existing physician population. WCMEW used population projections by age and gender from the Wisconsin Department of Administration for the county-level population forecasts.[23]

For example, based on statewide physician service utilization rates by age and gender, Outagamie is expected to see a 27.6% increase in demand for PCP services in 2035. Appleton's HSA is in Outagamie county, and therefore the 27.6% increase in projected demand for PCPs is applied to Appleton's current physician FTE. Additional FTEs needed to meet the baseline 50 PCP to 100,000 population ratio would then be added to the final 2035 figure.

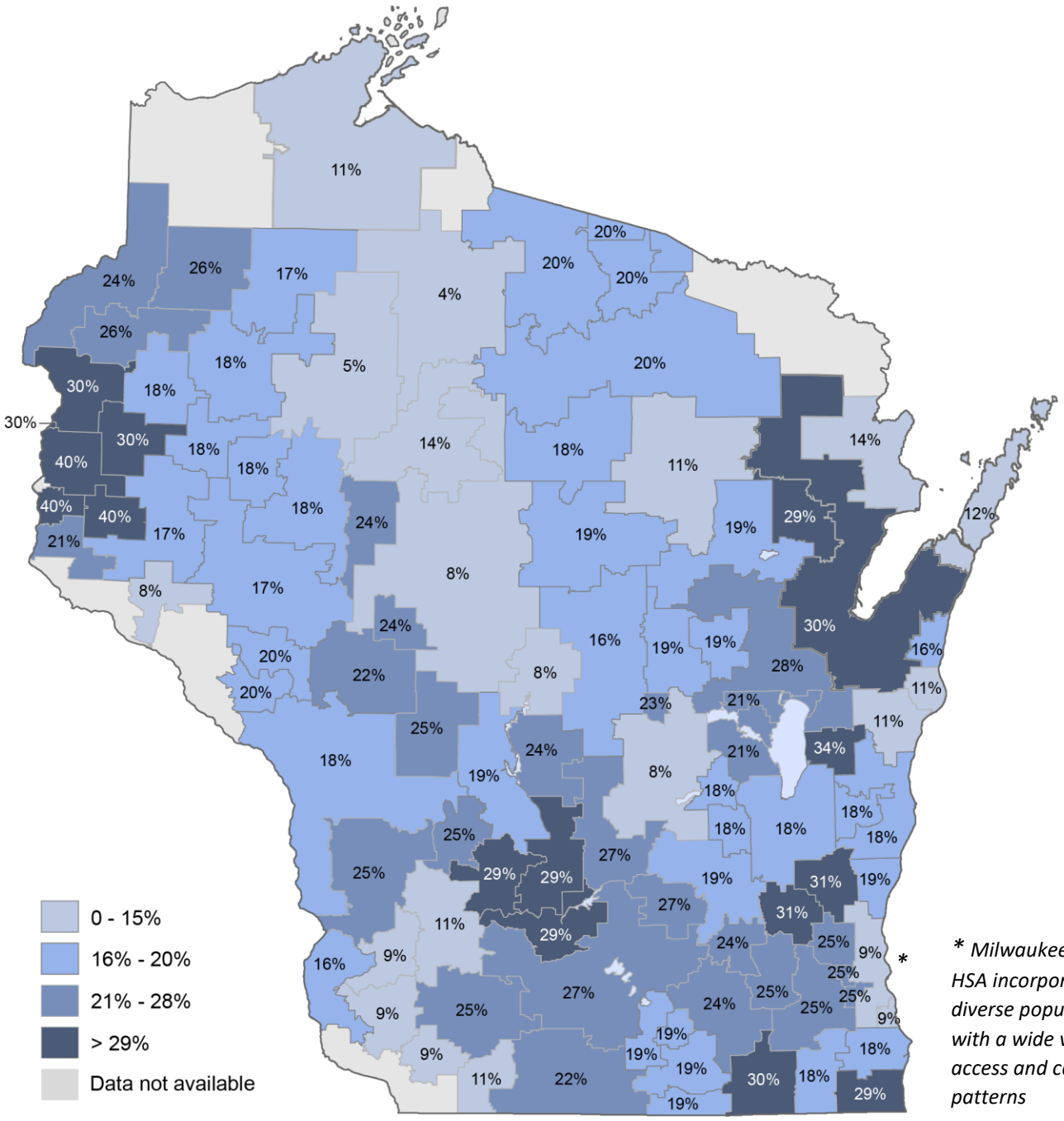


Using this method, WCMEW projected that all HSAs will see increased demand for physician services – driven by changes in population demographics. The average increase in projected demand for PCP services across all HSAs is a 20.4% - ranging from a nearly 40% increase in New Richmond to a 3.9% increase in Park Falls. Some HSAs will actually expect to see net outmigration, but care necessitated by aging residents results in a net increase in demand for physician services. Men over the age of 75, for example, consume on average 4.51 physician services per month, whereas adult men ages 25-44 consume on average 1.19 physician services per month.[24]

[22] *Complexities of Physician Supply and Demand*, Projections from 2015 to 2030. Association of American Medical Colleges, 2017; *Female Physician Compensation Report*. Medscape, 2017.
[23] *Population and Household Projections, produced in 2013, based from 2010 Census*. State of Wisconsin, Department of Administration, 2018.
[24] Wisconsin Health Information Organization database; Wisconsin Hospital Association Center analysis.

The following map indicates projected change in demand for physician services, based on population demographic shifts. All HSAs are expected to see an increase in demand for services. As evidenced, some areas will see significantly greater increase in demand for services compared to others. Considerable net population growth drives demand in metro and suburban areas.

Map 4. Increase in Demand for Physician Services (2035 Projection)



Data Source: WCMEW analysis of WMS physician database and DOA population data.

Supply To project supply, a pipeline model is used, which incorporates various physician development factors. WCMEW calculated projected supply by starting with the existing primary care complement and adding new physicians from medical schools, GME programs, and recruitments. Program-specific retention figures were used where available, with some exceptions for national data.[25] Retirements, out-migrations, and those leaving practice are subtracted from the totals. For this analysis, a conservative estimate of 70 years old was used for retirement age. Each of these factors or calculations is applied at the HSA level, resulting in supply projections at that level. The supply for each HSA is then compared with the demand, resulting in a surplus or deficit for each HSA. The table below shows current total physician FTE, with additional physician development inputs, indicating decreases in FTE from retirements and lifestyle changes. Data incorporates changing demographics (increased female physicians who work, on average, fewer hours) and a trend in fewer hours worked for young physicians, as previously described.[26]

Table 7: Investment in Physician Development

	Current Total Wisconsin FTE Physicians	**4,373**
Physician Production	WI Medical Schools	666
	Traditional GME Programs	1,182
	WARM and MCW Community Campuses	309
	New and Expanded GME Programs	156
	Turnover (In/Out-migration, recruitment)	404
Physician Reductions	Retirements	(1,934)
	Lifestyle Changes	(615)
	Projected for 2035	**4,541**

Begin with Total 2018 Physician FTE, and calculate production

Use WMS database with FTE equivalents for 2018 baseline. **Add**:

- Traditional medical school production, distributed to each HSA weighted by current percentage of total statewide physician population;
- Traditional GME programs (using locations for program and training sites);
- Community-based medical education (WARM and MCW expansions); and
- GME program grantees (using locations for program sites).

Reduce by turnover, retirements, lifestyle

Reduce production rates by **subtracting**:

- 1% turnover applied to non-rural HSAs;
- 10% turnover applied to rural HSAs (Society of Teachers of Family Medicine, 2017);
- Retirements conservatively estimated at age 70; and
- Overall reduction of 12% due to lifestyle changes (age and gender trends).

2035 Projection

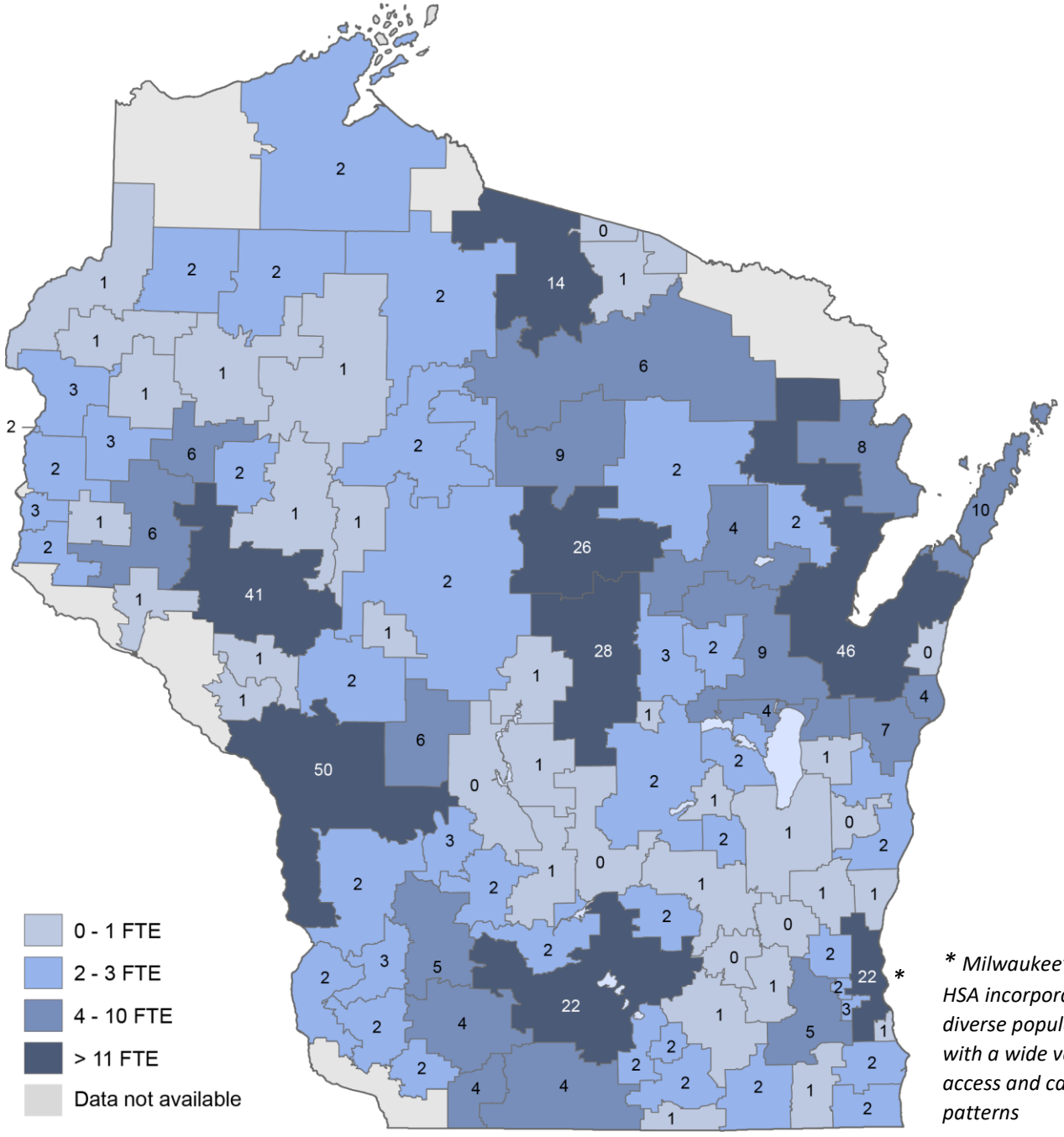
Projection estimates include:

- Both traditional and expanded physician development investments, minus turnover and retirements.
- Calculations in this report to do *not* account for any changes in care delivery.
- Final figure also accounts for current and projected lifestyle changes (age / gender).

[25] Phillips, Julie et al. *The Effect of a Community-Based Medical School on the State and Local Physician Workforce*. Journal of the Association of American Medical Colleges, 2018.
[26] IBID: AAMC and Medscape

The following two maps illustrate projected supply of physicians. The first (Map 5) includes only specific expansions or developments by new programs and initiatives (MCW, WARM, and GME grants), while the second (Map 6) includes these new programs, in addition to all traditional medical school graduates.

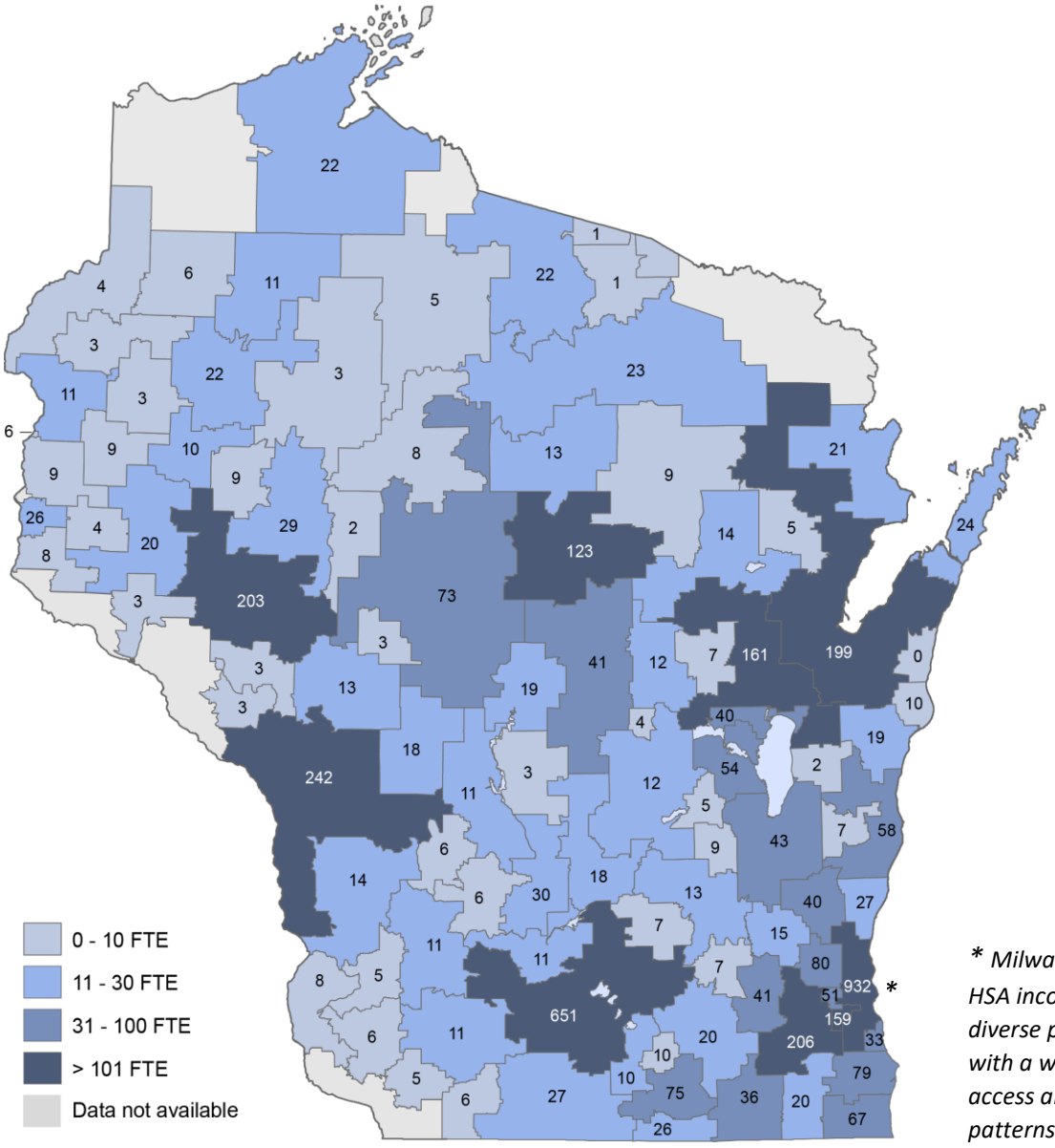
Map 5. State Investments in Physician Development (2035 Projection)



Data Source: WCMEW analysis of WMS physician database and programming data from WARM, MCW, and GME state grants.

The map below indicates physician development for all new programs, in addition to all traditional medical school graduates and programs.

Map 6. Total Physician Supply (2035 Projection)

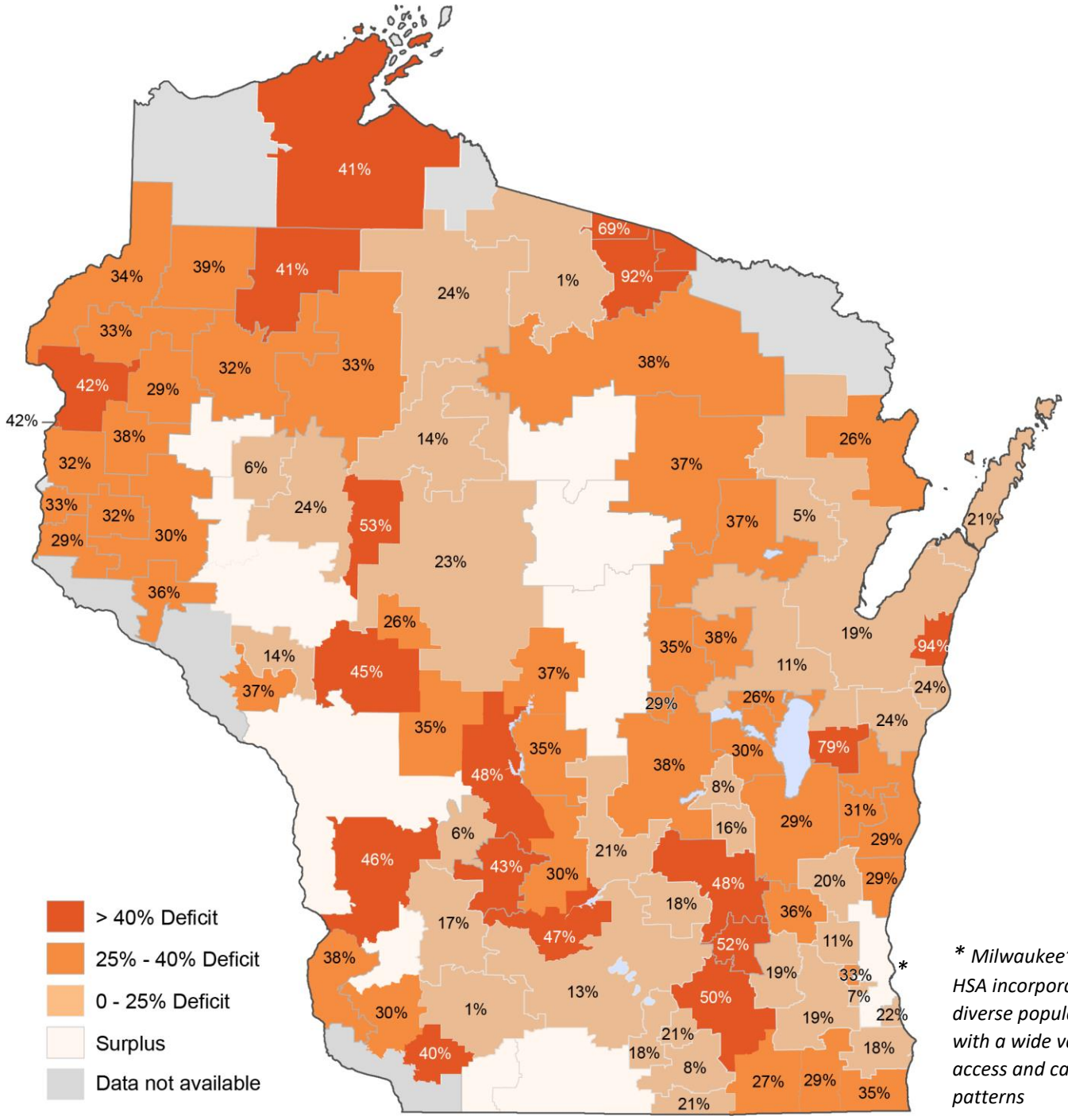


Data Source: WCMEW analysis of WMS physician database and programming data from WARM, MCW, and GME state grants.

In this report, maps showing projected deficits or surpluses provide data in two ways. One map shows percentages of unmet need, whereas the other shows FTEs needed to meet projected demand. Showing data in these two ways is critical to understanding that a small increase in the number of physicians providing care in a low-population area can make a significant impact. On the other hand, FTE equivalent demonstrates the magnitude of projected growth for Wisconsin's urban areas, which will continue to expand and require increased investments in workforce development.

The following two maps illustrate the projected deficit of physicians, measured first in percentage deficit across Wisconsin's HSAs in year 2035. Next, data is shown for total FTE equivalent deficit by HSA. In both maps, dark orange regions show the greatest deficit, compared to light orange regions (least deficit). Pale orange (unlabeled) regions indicate a projected surplus of physicians.

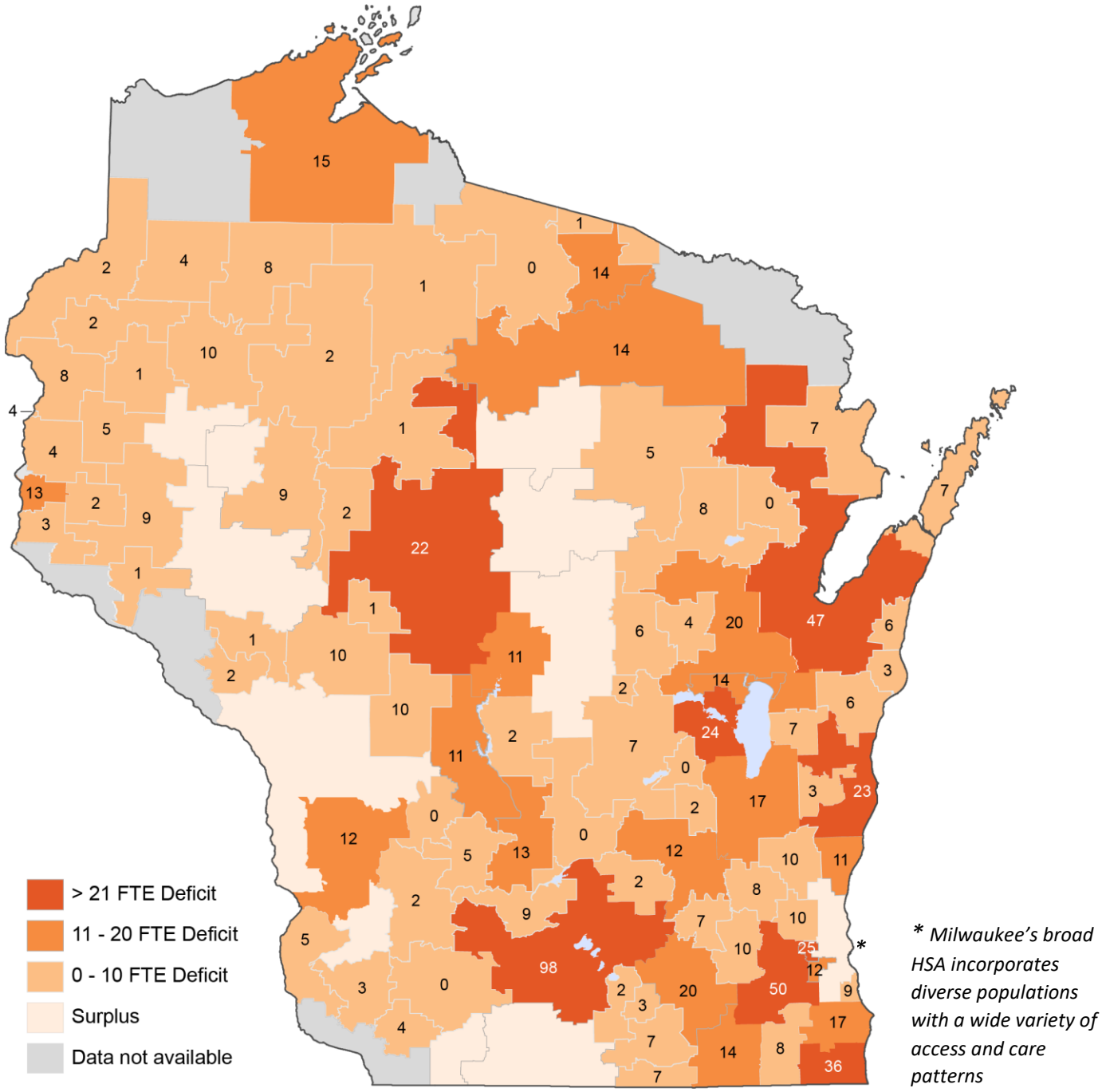
Map 7. Projected Physician Deficits, Percent of All Unmet Need (Year 2035)



* *Milwaukee's broad HSA incorporates diverse populations with a wide variety of access and care patterns*

Data Source: WCMEW analysis of WMS physician database, programming data from WARM, MCW, and GME state grants, and DOA population data.

Map 8. Projected FTE Physician Deficits (Year 2035)

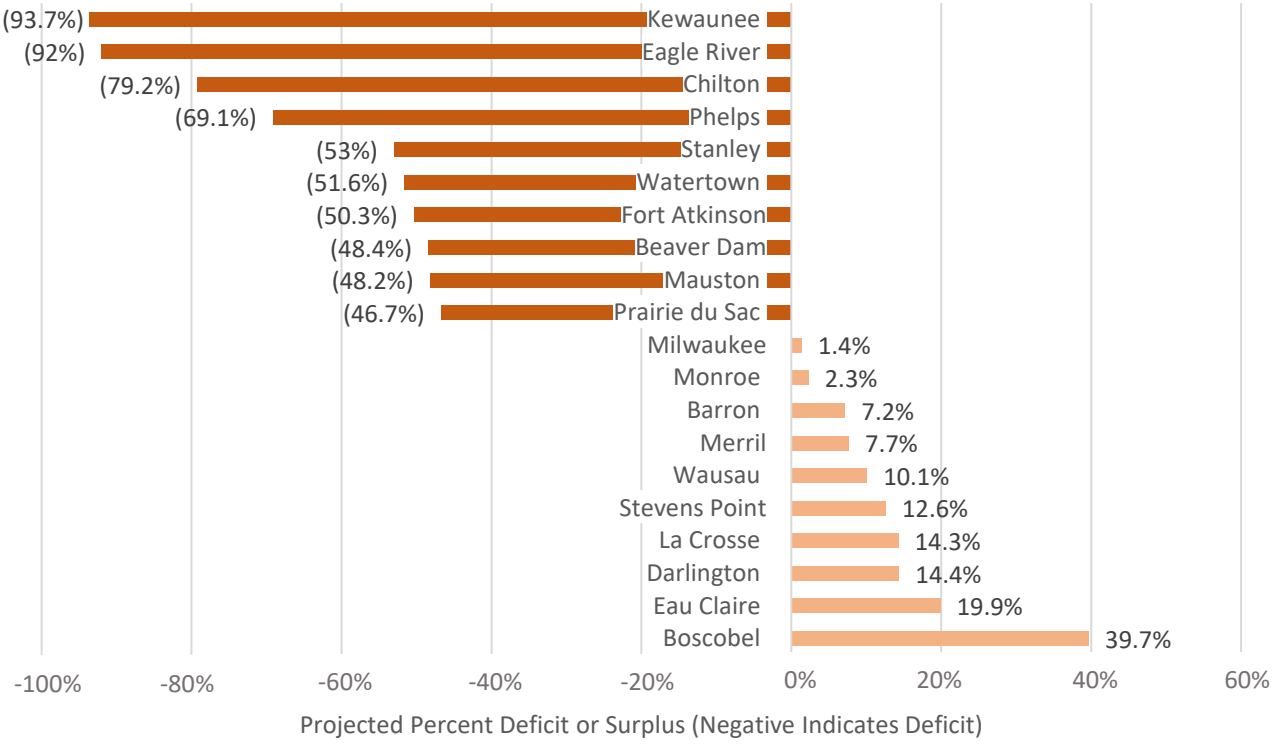


Data Source: WCMEW analysis of WMS Physician database, programming data from WARM, MCW, and GME state grants, and DOA population data.

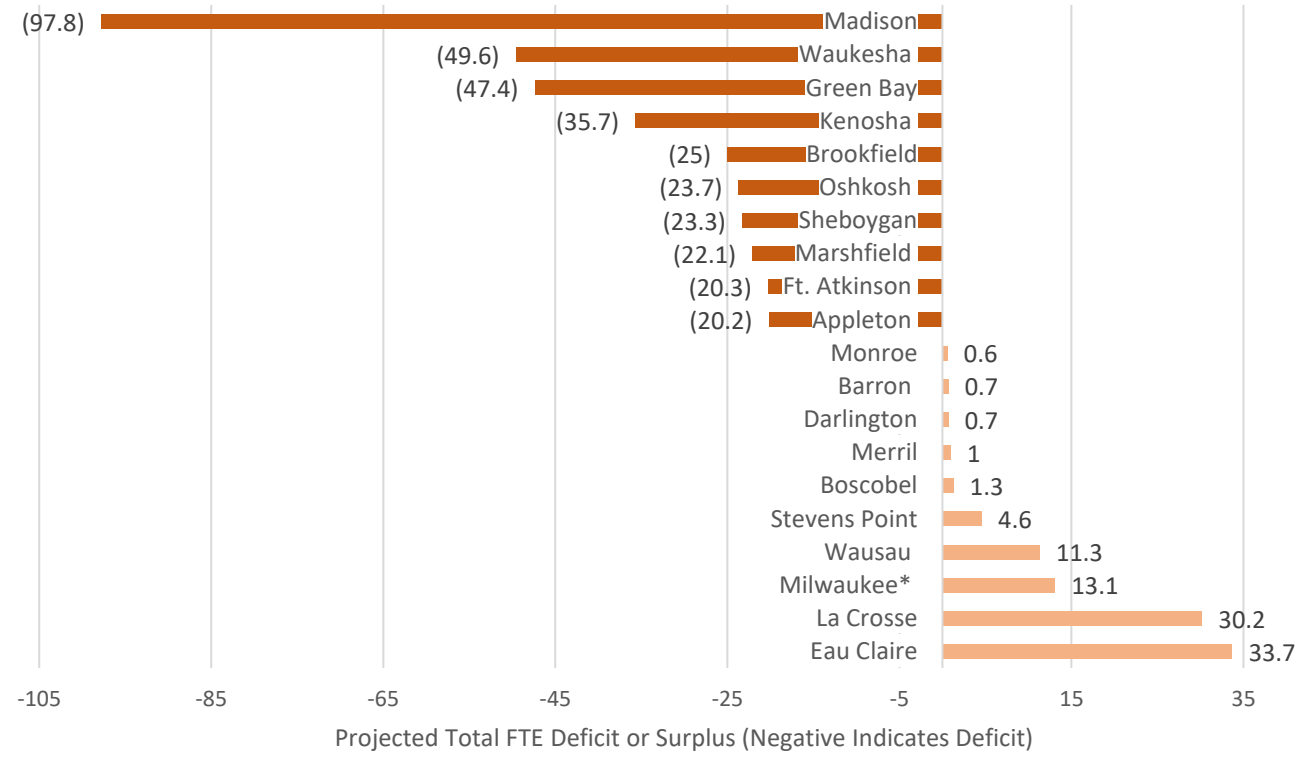
The map above illustrates the projected deficit of physicians, measured in FTE equivalent deficit for physician need, across Wisconsin's HSAs in year 2035. Dark orange regions show the greatest deficit, compared to light orange regions (least deficit). Pale orange (unlabeled) regions indicate a projected surplus of physicians.

The two graphs below show the 10 regions with highest and lowest projected deficits, first by percent of total deficit, then by total FTE deficit. Dark orange indicates highest deficit, light orange indicates a surplus.

Graph 4. Highest and Lowest Deficit and Surplus Areas, 2035 Projection, by Percent of Unmet Need



Graph 5. Highest and Lowest Deficit and Surplus Areas, 2035 Projection, by Total FTE



Beyond the Data

The data presented in this report is critical to understanding the needs of communities across Wisconsin's diverse geographic regions, demonstrating that some specialty areas and geographic pockets are facing especially steep clinician shortages.

Data only tells part of the story, however. To further understand the day-to-day realties of clinicians, policymakers, educators, hospitals and health systems in Wisconsin, WCMEW conducted interviews with several workforce partners. These include hospitals and clinics, as well as training institutions. The stories learned from human resources personnel, chief nursing officers, leadership, academic program leaders, recruiters, and others help shed light on what's working in Wisconsin, and where workforce challenges remain. Further, the experiences below stretch beyond the physician workforce – assessing the broader needs of health systems and the workforce as a whole. This expanded approach underlines the critical need to consider the workforce holistically.

Lessons from Health Systems Through interviews with several health systems around Wisconsin, WCMEW learned about the priorities and challenges they face – in terms of day-to-day activities, and also in how they address workforce strategically. The discussions centered on four topics:

- ✓ Incorporating Advanced Practice Clinicians into the care delivery system
- ✓ Coordinating clinical experiences for trainees
- ✓ Strategic approaches to workforce planning
- ✓ Recruitment and retention

Incorporating Advanced Practice Clinicians into the Care Delivery Team

Ascension North This health system understands that APCs are vital in providing access to patients in its rural communities. Physician Assistants (PAs) and Nurse Practitioners (NPs) in Woodruff, an hour north of Wausau, thrive within an independent practice philosophy. These APCs deliver care for their own patient panels, serving PCPs under the remote supervision of a physician. This is a different model than many other organizations, where a physician still operates as the PCP, and APCs are used to offset demand for care. While this model works to provide access to care for many patients that would otherwise be left without a quality provider, physician recruitment is still a daily need and challenge for rural sites.

Eagle River (Northern Wisconsin) uses an NP Hospitalist model, with NPs taking on telehealth patients where the system has been unable to recruit physicians. While Ascension has figured out how to maximize care through APCs, they are also very aware of this model's limits. APCs do still require a degree of supervision, for Medicare co-signatures and other requirements, and physicians can be needed for complex patient care. Leadership reports that recruiting for these rural physicians is very challenging, especially as some physicians may opt for early retirement.

Beloit Health System Integrating APCs and students into care delivery are two priority areas for Beloit Health System. Beloit Memorial has been actively seeking to integrate APCs as collaborators, but many providers still see them as physician extenders. They have found that matching APC and physician preferences for patient care and degree of independent practice is critical to effective utilization of each provider. Preferences may be based on training, employment experience, and provider age.

Beloit has found that APCs enter the medical field with a wide range of experiences and training, where some have had high-quality clinical experiences and are ready to hit the ground running, and others require significant additional on-site training. Some programs have moved to accelerated models with condensed curriculum, and Beloit's experience has been that not all programs may adequately prepare students for independent practice. Caps on GME training hours (currently set at 80 per week) have added to the time it takes to develop comfortable, trusting relationships among providers. While expanding training programs is critical to meet shortages, balancing quality and speed of education is critical to ensuring students are adequately prepared for practice.

Froedtert and Monroe Clinic: Integration of Clinical Pharmacists WCMEW spoke with two health systems that have expanded the roles of pharmacists in clinical practice, providing direct patient care and further enabling other clinicians to practice in their areas of expertise. The first is *Froedtert's* centralized team of Prior Authorization and Prescription Renewal Technicians, who now manage prior authorizations, prescription renewal requests, and documentation for timely medication processing – covering approximately 40% of all prescription renewals. Since 2015, Froedtert's initiative has allowed nurses, who formerly managed prior authorizations and renewals, to spend more time in care coordination and education along with other direct patient care. Pharmacy Technicians have become content experts – able to work closely alongside multidisciplinary teams to increase effectiveness and efficiency. This initiative has shown positive results through nursing satisfaction surveys.

Froedtert also has placed Pharmacists in its Primary Care clinics as a part of the overall care team with specific population-based areas of focus. Pharmacists can manage the care of high-risk patients, focusing on diabetes and medication adherence-related challenges. The team has demonstrated significant improvement in diabetic blood sugar control, which is subsequently maintained even after no longer working with the pharmacist. Froedtert's Ambulatory Pharmacy Manager reports that once clinic staff become more educated about Pharmacist training and see the results in patient outcomes, they are more apt to collaborate with Pharmacists.

Monroe Clinic All physicians and APCs hired by the Monroe Clinic are oriented to be prepared for the clinic's unique approach to Pharmacist integration. Pharmacists at the Monroe Clinic have collaborative practice agreements and are credentialed and privileged similar to NPs and PAs at the site. Pharmacists manage conditions such as diabetes and high cholesterol, working directly with patients. This team-based approach allows increased access to physicians for higher-acuity patients. Beginning in January 2018, the clinic began proactively screening physician panels to identify patients who could be served by Clinical Pharmacists for chronic disease management. With new systems in place and an orientation for staff, the clinic reports that physicians look to refer patients to Pharmacists and have developed a true team-based relationship.

Strategic Workforce Planning

Aurora Health Care, one of Wisconsin's largest health care providers, has prioritized proactive workforce development through its initiative of Provider Workforce Planning. Beginning in 2014, Aurora's workforce team has engaged in comprehensive planning for all physicians, APCs, and Allied Health Professionals. The process was originally designed to address recruiter challenges, including little advance notice for filling positions, and lack of data regarding regional anticipated needs – concerns not unique to Aurora. The health system sought to develop a proactive way to facilitate planning by recruiters, but the system has developed into something far more comprehensive, one that is used today for growth planning and medical group management.

The initiative works by integrating three key variables into a workforce algorithm, applying consistent methods for development of recruitment recommendations. These variables include attrition risk, current capacity, and growth. While planning is designed for three-year periods, input is solicited annually through a jointly owned process by all parties. Each year, physician and administrative leaders refresh underlying data and are able to consider the unique cases of each setting. For example, integration of APCs or degree of independence for a clinic is considered in each case. The algorithm establishes baseline recommendations for clinician recruitment, with a model that is constantly adjusted to account for unique circumstances of each setting. Leaders can also access dashboards and check on progress all in one location, facilitating proactive planning. The process has served to unite service lines and market leaders, who engage in planning and discussion together. This engagement decreases disconnect and leads to increased understanding of real-time information about the needs of each setting.

Coordinating Clinical Experiences for Trainees

Beloit Health System Clinical experiences contribute significantly to the preparation of medical, nursing, APC, and all other students across the state. Multiple hospitals and health systems expressed their concerns regarding increased competition for clinical sites as schools continue to admit more students for training. Leaders expressed concerns regarding lack of coordination between schools and sites, and even shortages of training opportunities for their own employees seeking continuing healthcare education.

Beloit has experienced a “constant barrage for requests” for sites from schools across Wisconsin and their neighbor, Illinois. Beloit’s Director of Provider Recruitment and Retention and Director of Nursing Recruitment note that there are not only negative effects on staff time and inefficiencies in coordination, but that students may not have a positive educational experience if sites are not effectively managed. Clear systems are needed for authorizing preceptors, assigning students, and tracking rotations, along with a clear strategy for prioritizing which students to accept. Disjointed systems and practices may contribute to confusion with intake paperwork, schedules, and burnout for preceptors. Staff have been diligently managing students to this point but are seeking systems that will allow for more coordinated structures for students, ensuring they have an optimal learning experience and maximize system resources.

Recruiting and Retention

Ashland Memorial Medical – a rural hospital in Northern Wisconsin – has found that compensation is only one element of their physician recruitment strategy. Ashland maintains competitive salary and benefit packages, but has really focused on developing a culture and community that attracts providers. The hospital actively involves physicians in decision-making discussions around productivity and other issues, with informal groups that develop recommendations for hospital leadership on various policy and patient care issues. Another way Ashland stays competitive is by showcasing the hospital's forward-thinking perspective on workforce planning. Leadership is proactively considering new positions in the health care field, in both clinical and administrative roles, that will transform how care is coordinated and delivered. For example, Ashland is looking for ways to effectively incorporate quality metrics through "patient experience" staff positions. These emerging positions in the healthcare field are challenging to develop and optimize, but demonstrate how healthcare leaders are thinking creatively about care delivery and recruiting the next generation of care professionals.

Sauk Prairie has been successful at recruiting and retaining clinicians, and attributes their successes to a positive "excellence in people" climate – where deep roots in quality patient care are ingrained in every aspect of their work. Sauk Prairie emphasizes building a positive culture to growing a tree, one that requires a time-consuming, constant process of growth and messaging. Employee excellence is also embedded in pay for performance measures, with impacts on gain sharing. As an independent hospital with flat management structure, Sauk Prairie is also able to exercise timely responsiveness to staff needs. For example, one of its clinics recently experienced an Emergency Technician shortage and could quickly adapt with compensation changes to fill the need.

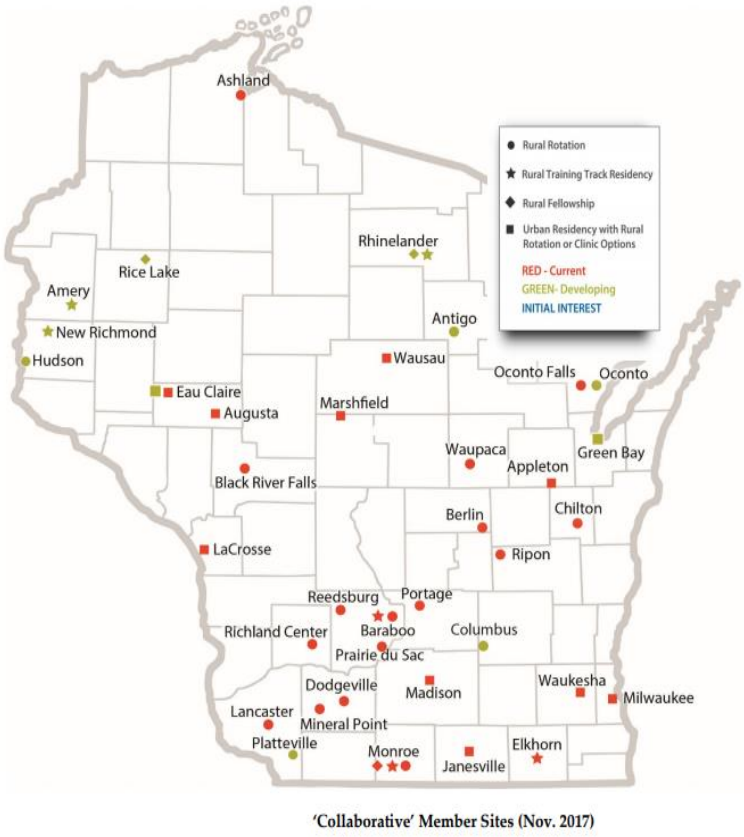
The organization also has the flexibility to recruit carefully, acknowledging that each hire can have ripple effects – therefore Sauk Prairie is willing to have a vacant position, even in senior leadership, rather than compromise on the right fit. As Sauk Prairie has grown from 425 to over 600 employees in the last decade, it has sought to retain the small-town feel and collaborative decision-making of a community leader. While physicians have transitioned from independent contractors to employed providers, Sauk Prairie has also sought to respond to their requests for financial transparency and other management decisions. Sauk Prairie has been largely successful at developing a positive climate, but cited their continued frustration with complex regulatory policy regarding APC practice that slows their willingness to hire the APCs needed to provide care to an ever-growing patient population.

Sauk Prairie has the flexibility to recruit carefully, acknowledging that each hire can have ripple effects – and is willing to have a vacant position, even in senior leadership, rather than compromise on the right fit.

Lessons from Educators WCMEW also interviewed educators around Wisconsin to learn about their challenges and successes in workforce development. The discussion centered on programs and initiatives that focus on rural and underserved areas. Programs below include both physician and APC training initiatives that seek to further develop providers for Wisconsin's future care needs.

WRPRAP Since 2010, the Wisconsin Rural Physician Residency Assistance Program (WRPRAP) has contributed to the development of new rural residency programs and tracks, increasing the number of open slots for medical residents and fellows who aim to practice medicine in a rural community. In 2017, WRPRAP awarded 10 grants for a total of $770,121. Some of these awards include: the Aurora Lakeland Rural Training Track Family Medicine Residency Program, MCW Central Wisconsin Psychiatry Residency Program, and the UW Obstetrics & Gynecology Residency Program. The map to the right shows rural GME sites supported by WRPRAP funding, where red indicates current sites and green indicates developing sites.[27]

Since 2010, WRPRAP has invested in developing seven new rural residency programs and opening 23 new rural positions for the residents and fellows who fill them today. The MCW General Surgery Residency Rural Track and Psychiatry Residency programs both aim to increase practice in underserved areas, part of MCW's expansion into the Green Bay and Central Wisconsin regions. WRPRAP continues to increase access to high-quality training experiences for Wisconsin physicians, and received increased funding in 2018. However, demand for residency training still outstrips available GME positions in the state.



'Collaborative' Member Sites (Nov. 2017)

WARM and TRIUMPH The UW School of Medicine and Public Health (UWSMPH) rural and urban programs admit medical students with specific interest in underserved populations. The Wisconsin Academy for Rural Medicine (WARM) admitted its first cohort of five students in 2007, with 126 graduates to date, including 25 students in 2017. Of all graduates, 46% provide care through Wisconsin

[27] Wisconsin Rural Physician Residency Assistance Program, 2017 Annual Report. Department of Family Medicine and Community Health, 2018.

residencies, and 52% of all WARM graduates select a focus in primary care. Of the 35 WARM graduates who have completed their residencies, 91% practice in-state, 56% practice in rural areas, and 38% have returned to their hometowns.

WARM students select primary care specialties 30% more frequently than non-WARM peers. Approximately twice as many WARM students match in-state for residencies compared to other UW medical students, and similarly WARM students remain to practice in WI post-residency at nearly double the rate of non-WARM students. Of note, most WARM graduates who select primary care stay in that field, while about three-quarters of peers who enter internal medicine or pediatrics end up subspecializing.

Of the 35 WARM graduates, 91% practice in Wisconsin, 56% practice in rural areas, and WARM students select primary care specialties 30% more frequently than non-WARM peers.

Training in Urban Medicine and Public Health (TRIUMPH) is UWSMPH's flagship effort to recruit and prepare medical students to serve people living in urban Health Professional Shortage Areas (HPSAs). Through its nine years, TRIUMPH has graduated 98 individuals, with an additional 52 students currently enrolled. 61% of graduates have elected a career in primary care.

WiNC The goal of the Wisconsin North Central Graduate Medical Education (WiNC GME) Consortium Development Project is to address the need for additional GME resources for the northernmost 37 counties in Wisconsin. WiNC plans to form a GME Consortium to add additional residency positions and programs in family medicine and psychiatry to rural northern Wisconsin and increase the availability of locally trained physicians. WiNC also aims to train faculty for leadership positions in GME, develop more robust recruitment and retention strategies, and enhance workforce analysis to inform sustainability of physician workforce in the region. A group of health systems, medical schools, residencies and healthcare advocacy groups, including WCMEW, currently support the Consortium. Stakeholders developed the consortium as part of a needs assessment over an 18-month period. WiNC is currently seeking operational funding to hire staff, recruit sponsoring institutions, and move toward employing residents who will provide much-needed care in rural Wisconsin.

The goal of the Wisconsin North Central Graduate Medical Education Consortium Development Project is to address the need for additional GME resources for the northernmost 37 counties in Wisconsin.

Wisconsin Physician Assistant Community-based Track (WisPACT) is an initiative that aims to address the rural demand for APCs. The venture is a collaboration between UW-Madison and rural partners including Aspirus, Ascension North Region, Marshfield Clinic, and Essentia Health, which provide PA clinical rotation sites in northern and northcentral Wisconsin. WisPACT is one of several options through UW-Madison's PA program, which graduates 52 students each year. The WisPACT option was originally funded by a Health Resources and Services Administration (HRSA) grant beginning in 2012, but is now self-sustaining. WisPACT graduated its first class of four students in 2016 but has expanded to enroll 12 students each year.

With two years of WisPACT alumni data, the program reports that 83% of graduates remain in rural care in the northern and northcentral Wisconsin regions.

The program allows students with a specific interest in rural care to study and train in rural Wisconsin areas, while completing the same coursework as their peers in Madison. Targeted recruitment specifically reaches students from rural areas or those who have shown dedicated interest in rural health. Students may apply directly following undergraduate programs, or enter wisPACT as Nurses, Physical Therapists, or other clinical professionals. WisPACT offers a delivery hybrid, where students spend a minimum of two days each week on campus during their didactic first year, and may opt for remote learning for other sessions. That way, students in communities such as Eagle River or Minocqua can reduce travel time, but still receive the same web-based coursework as other students in the Wausau classroom, or on the Madison campus. An additional UW track in Distance Education (DE) enrolls 10 PA students each year in Wisconsin and surrounding states, allowing for nearly full remote education where students can remain in their rural communities through both didactic and clinical years.

With two years of WisPACT alumni data, WisPACT reports that 10 of the 12 (83%) graduates remain in rural care in the northern and northcentral Wisconsin regions. Almost half work in Family Medicine, and many students receive job offers from clinical rotation sites early in their second year of the program. WisPACT is the only program that specifically aims to bring rural training experiences to Wisconsin students throughout their PA education.

Findings and Recommendations for Wisconsin

New education and training programs have shown positive results in PCP expansion and retention across Wisconsin, leveraging noteworthy innovations in clinical training and in-state retention strategies. However, demand for PCPs, driven by an expanding and aging population, will outpace projected supply. To date, a largely uncoordinated approach to education and training has hampered a comprehensive solution to the impending problem of workforce shortages. Further, 40% of the current PCP workforce is expected to retire by 2035, a challenge which is compounded by other major demographic shifts. Provider gaps will be distributed unevenly across the state – with most regions experiencing significant deficits in future PCPs. Based on these conclusions, Wisconsin cannot expect to fill the demand for primary care through the physician workforce alone.

Implications Data points toward several future challenges. First, even considering the new and expanded undergraduate and post-graduate medical education programs, there will be a statewide shortfall of PCPs by 2035. Second, analysis clearly indicates that rural communities or small towns will experience some of the highest percentage of shortages, for several reasons. Projections show that rural and small-town communities will see increases in aging populations, which drives the need for physician services.

At the same time, many of these communities are also experience outmigration, with little or no net population growth. The result will be a remaining population skewed toward older and higher acuity patients, while having fewer individuals available for the workforce. These communities will be in greatest need for education and training infrastructures to be able to "grow their own", as well as take advantage of existing infrastructure programs.

> ***The remaining population will be skewed toward older and higher acuity patients, while having fewer individuals available for the workforce.***

Suburban and metropolitan areas are also projected to experience significant increases in demand for PCP services, driven by proximity to cities and in-migration to those areas. These projected increases are significant, and hospitals and health systems will need to develop plans to accommodate population growth in metro and suburban regions. However, recruiting providers to these areas has historically been less challenging than rural communities. While the increased demand for care in suburban areas must be monitored and strategically evaluated, suburban areas have traditionally been able to operate more flexibly to fulfill recruitment needs to sustain growth. As previously mentioned, complex patters in access to care are not captured within Milwaukee's HSA, so further investigation of sub-HSA workforce projections are needed for that area, with a focus on the inner-city.

Surpluses This report identifies several metropolitan and suburban areas with projected PCP surpluses – based on current physician and patient populations, and supply and demand projections – also incorporating a 50 PCP to 100,000 population baseline. Historically, areas with a higher physician to population ratio have not been assessed to establish implications of possible excess supply, though acknowledging their existence is not new. One common explanation downplays possible surpluses,

arguing that patients will travel to cities for their primary care. Evidence regarding potentially preventable hospitalizations suggests that incidence of these hospitalizations is highest in remote rural areas, indicating a lack of primary care, and unwillingness or inability to access preventative services.[28] Research suggests that adult patients are willing to travel approximately 30 minutes to access routine care, or travel approximately 20 miles.[29] Therefore, patients cannot be expected to travel to surplus areas for preventative services. Another argument relies on telehealth, explaining surpluses by assuming metropolitan physicians are providing services remotely to rural patients. However, much of Wisconsin still lacks sufficient access to broadband internet services.[30] Further, structures may not be in place to deliver services, even if sufficient internet access is available. Surpluses may indicate nearby residents are indeed accessing care across HSA regions, or that telehealth is being delivered, but also that providers may be best redistributed to areas that are currently underserved.

Care Delivery Low physician-to-population ratios might not necessarily be an indication of lack of access to primary care. Some strategies could and currently are mitigating this situation; such as care delivery models that leverage non-physician resources. For example, the community may excel at leveraging team-based care or integrating APCs as independent providers. Obviously, low physician numbers could also indicate where patients are severely underserved. Each case is unique and should be addressed as such. Additional data and analysis are needed here to assess whether current models, for example those supporting low-physician areas, are working, or whether they need additional resources to ensure success.

> ***The value of in-state, and more specifically, local or regional training cannot be over-stated.***

Local Training In spite of the projected shortfalls in physician supply, the value of in-state, *and more specifically, local or regional training* cannot be over-stated. Based on data presented in this report. Wisconsin medical schools – and increasingly community-based residency programs – are instrumental in producing Wisconsin physicians who are likely to stay and practice in our state. With over one third of current Wisconsin physicians having completed their GME training in-state, these positions are critical to the sustainability of Wisconsin medical preparation. Further, the growing numbers of GME programs in rural areas are beginning to address the increasingly critical shortages in these regions of Wisconsin.

Hospitals and Health Systems Leaders identified various challenges and successes regarding recruitment and retention of providers in rural communities. A broad spectrum of experiences regarding integration of APCs was described – where some areas have excelled at integration, and others are frustrated by complex regulatory policies governing practice. These barriers alone may hamper expansion of hiring and leveraging APCs for patient care. Training programs for APCs have been valuable in making clinicians available to provide care in areas short of physicians, but physicians are still necessary resources in remote care teams.

---

[28] Torio, Celeste et al. *Geographic Variation in Potentially Preventable Hospitalizations in Acute and Chronic Conditions, 2005-2011.* Agency for Healthcare Research and Quality.
[29] Yen, Wei. *How Long and How Far Do Adults Travel and Will Adults Travel for Primary Care?* Washington State Health Services Research Project, 2013.
[30] Wisconsin Broadband Map, Public Service Commission of Wisconsin, Wisconsin Broadband Office.

Systems practice various degrees of proactive workforce planning, but have found success in working collaboratively to forecast needs and plan accordingly. Several systems expressed concerns regarding the need for greater integration of students into clinical settings, including resources needed for coordination, ensuring high-quality student experiences, and growing competition for sites. Expanded opportunities for clinical sites are needed in light of increased competition by increased class sizes and emergence of new training programs across the state.

Recommendations

Continued Emphasis on Infrastructure and Long-Term Planning

Proactive, data-informed decision-making is critical at health systems, government levels, and educational institutions. Several programs are showing early results that warrant continued investment. At the same time, these programs need to be open to emerging issues and to creative partnerships. And a longer-term perspective needs to be brought into workforce development.

1. **Continue to fund programs that invest in infrastructure development and training**. Target current and projected underserved geographic areas (identified in this report) to prioritize workforce development in underserved areas. These infrastructure programs must also be flexible to emerging demands for financing of housing, travel, and other barriers.
2. **Expand and better coordinate clinical training sites.** Along with the funding for program development, efforts should be made to ensure an adequate number of clinical training sites, including the necessary resources such as faculty and preceptors. In addition, systems and procedures should be implemented to better coordinate clinical placements to ensure that these limited resources are appropriately utilized. Develop proactive solutions regarding competition among training institutions and students for clinical sites
3. **Expand rural and underserved programs by recruiting students likely to stay.** Programs with a rural or underserved focus should continue to prioritize recruiting students likely to dedicate their practice to underserved areas, and educational institutions should commit resources to assessment of application and admissions processes to ensure policies support desired outcomes.
4. **Build workforce into strategic planning processes**, enabling long-term workforce viability and investment. Share best practices regarding what is working well regarding planning, and where improvement is needed.

Collect and Leverage Data for Decision-Making

To accurately assess workforce trends and implications across Wisconsin, more data is needed in several areas to ensure relevant and timely evaluation of workforce issues.

5. **Develop comprehensive APC workforce data.** While there is significant data available on the physician and nursing workforces, an insufficient data infrastructure exists for APCs – and data is not integrated or comparable across provider types. Understanding the current demographics and geographic distribution of APCs is critical to assessing care models and implications. WCMEW should create a database to facilitate the modeling of future supply and demand, assessing distribution across clinicians and across regions.

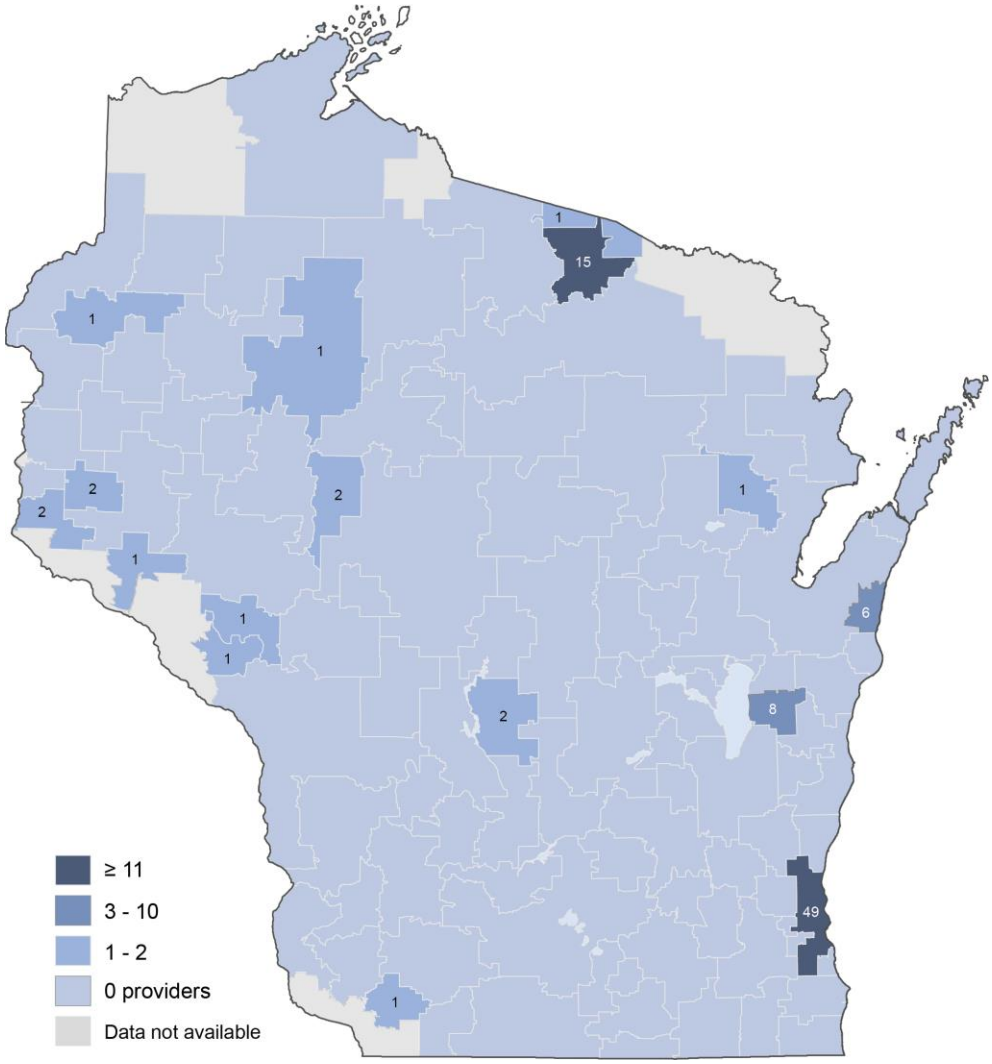
6. **Best practices and outcomes for team-based care must be identified.** Outcomes may include patient health, cost-saving, and other indicators. Effective models must be shared across care settings, geographic regions, and specialties to ensure that all members of the workforce are being most effectively utilized.
7. **Track data longitudinally to ensure accurate analysis of program reforms and expansions.** New medical school expansions and GME funding have contributed to significant advances of provider training across Wisconsin. However, sufficient data is not available to track long-term outcomes. Assessing rationales for relocating or leaving practice must also be tracked to evaluate decision-making processes and ensure incentives align with desired outcomes.
8. **Develop methods to assess distributions of populations and providers across regions that most accurately reflect patient access to care, given current imperfect current geographic units.** This report utilizes Health Service Areas for patient and provider data, but using transportation patterns or other methods may more accurately reflect real care delivery trends.
9. **Explore and identify which providers in Wisconsin will be most needed for the state's aging population.** Today, priority for grant funding and other development projects is given for primary care, but tomorrow's patient population may require providers such as gerontologists to meet the needs of an aging population.

Appendices

Appendix I: PCPs Needed to Attain 50 PCP to 100,000 Population Ratio

The map below illustrates the number of PCPs in each HSA that would be needed to reach a 50 PCP to 100,000 population ratio. Wisconsin's Primary Care Service Office uses population ratios of 28.6 to 33.3 to designate Primary Care Health Professional Shortage Areas (HPSAs), along with other income and geographic data.[31] The data source used for HPSA analysis is different from that of WCMEW's analysis, as is the method for arriving at physician FTE. Through the HPSA analysis, a total statewide shortage of 161 primary care providers would be needed to remove Wisconsin's HPSA designations.[32] HPSAs include general obstetrics / gynecology physicians as PCPs, whereas the AAMC guide used to establish PCPs for WCMEW's analysis does not.

Map 9. PCPs Needed to Reach 50 PCP to 100,000 Population Ratio, by HSA



Data Source: WCMEW analysis of WMS physician database and DOA population data.

[31] *Number of Providers Needed: Primary Health Care*. Wisconsin Office of Rural Health, 2018.
[32] Ibid.

Appendix II: Methods

Supply was estimated according to several factors. Retention rates for traditional medical schools and GME programs are based on historical data for Wisconsin. HSA totals for new programs – community-based medical schools and DHS funded GME programs – are based on the education and training sites for those programs and retention data from a study by Michigan State University.[33] HSA totals from DHS GME grant funding are based on training sites for those programs and retention data from the Michigan State University cited above. Turnover rates are derived from a study by the Society of Teachers of Family Medicine.[34] Finally, ending projections for certain HSAs exceed what were judged to be sustainable, and were therefore reduced.

The Demographic Services Center estimates the total population for Zip Code areas annually. At the 2010 Census, the Census Bureau defined Zip Code Tabulation Areas (ZCTAs), which correspond roughly (but not exactly) to the Zip Code delivery areas delineated by the U.S. Postal Service. To calculate these estimates, the Demographic Services Center uses data from the most recent Census, cross-tabulating the number of persons within each minor civil division and ZCTA. These estimates are used to calculate current and projected populations across Wisconsin's HSAs.

Appendix III: Assumptions and Limitations

The authors of this report acknowledge several assumptions and limitations related to data collection and analysis. First, this report does not use licensure data, as would be possible with the Registered Nurse workforce, due to lack of a physician mandated re-licensure survey. The dataset used for physician workforce analysis is continuously updated by the Wisconsin Medical Society, but is not entirely complete. The dataset includes 14,354 active physicians across all specialties, compared to a total of 16,953 licensed active physicians according to records from the Department of Safety and Professional Services (DSPS) in March of 2018.[35] However, DSPS data also includes licensed residents and fellows, who are not included in the primary dataset used for this analysis. The most recent Association of American Medical Colleges Wisconsin Workforce Profile includes data for 15,026 active physicians.[36] No statistical analysis was conducted to account for discrepancies between the WMS and DSPS datasets. There is no reason to believe that WMS records would be biased toward a particular region, specialty, or other subset, therefore errors can be assumed to be distributed uniformly across the state, as well as across physician demographics.

The WMS physician dataset provides only the primary practice location for physicians, therefore omitting practice information for care conducted at other sites. Nor does the dataset include FTE status of all physicians, or administrative appointment information. Therefore, FTE equivalences based on average hours worked by gender and by age are applied based on data available from a 2015 AHEC Data Brief

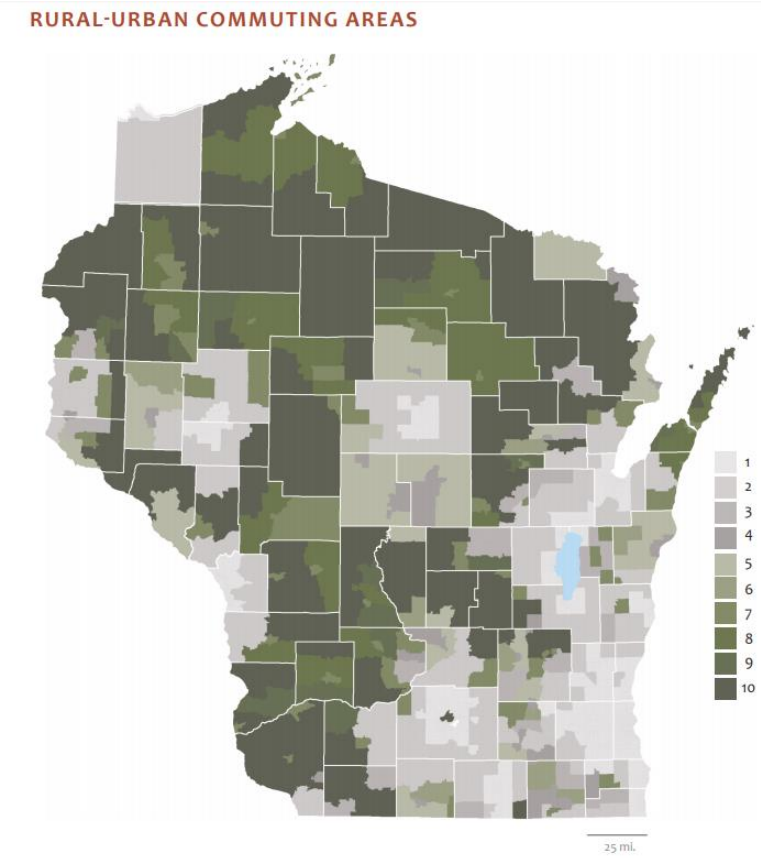
[33] Phillips, Julie et al. The Effect of a Community-Based Medical School on the State and Local Physician Workforce. Journal of the Association of American Medical Colleges, 2018.
[34] Nelson, Gregory and Gruca, Thomas. *Determinants of the 5-Year Retention and Rural Location of Family Physicians: Results from the Iowa Family Medicine Training Network*. Society of Teachers of Family Medicine, 2018.
[35] *Wisconsin Department of Safety and Professional Services – License Counts as of 05/15/2018*. DSPS, 2018.
[36] *Wisconsin Physician Workforce Profile*. Association of American Medical Colleges, 2016.

using 2011 and 2012 data, *Primary Care Physicians*, and a 2015 AAMC publication, *The Complexities of Physician Supply and Demand: Projections from 2013 to 2035.*[37,38]

As noted previously, this report does not account for changing methods of care delivery or for projected insurance coverage patterns. The analysis for demand projections is made using a single scenario that incorporates no degree of projected increases of team-based care, increased adoption of telehealth, or other care delivery reforms. Further, this report does not account for changing patterns in care received, such as increased physician visits due to gains in insurance coverage.

Further, the Dartmouth Atlas's Hospital Service Areas (HSAs) were identified originally in the 1990s. According to the Dartmouth Atlas, "in the intervening years, hospital closures have left some HSAs with no hospital; these HSAs have been maintained as distinct areas in order to preserve the continuity of the database."[39] Therefore, some of Wisconsin's HSAs may not currently have a hospital – such as Kewaunee. WCMEW did not make any adjustments to analysis to account for HSAs that formerly held hospitals, but no longer serve as local health care markets.

Appendix IV. Mapping Urban and Rural Areas in Wisconsin



This report utilizes RUCA Codes, or Rural-Urban Community Area Codes to identify metropolitan, micropolitan, and small town / rural zip codes. The RUCA map below is courtesy of the Wisconsin Office of Rural Health, where WCMEW used the following classifications to identify zip codes:[40] Appendix V. Data Findings, By Hospital Service Area.

RUCA Classifications

Small Town & Rural:
RUCA 7-10

Micropolitan:
RUCA 4-6

Metropolitan:
RUCA 1-3

[37] *Primary Care Physicians, Wisconsin AHEC Workforce Data Brief*. Wisconsin AHEC, 2015.
[38] *The Complexities of Physician Supply and Demand, 2018 Update*. Association of American Medical Colleges, 2018.
[39] The Dartmouth Atlas of Health Care, Data by Region.
[40] Wisconsin Divided Six Ways: A Review of Rural-Urban Classification Systems. Rural Health Data Canvas and the Wisconsin Office of Rural Health, 2016.

Appendix V. HSA Data

The table below indicates data for each of Wisconsin's Hospital Service Areas (HSAs), for each of the elements show previously in this report. For the final two columns, negative numbers (shown in parenthesis) indicate deficits, whereas positive numbers indicate surpluses for 2035 projections.

Table 8. Data, Wisconsin Hospital Service Areas

Hospital Service Area	PCP per 100,000 population	Estimated Percent Change in Demand for PCPs (2035)	Estimated Supply PCP per 100,000 population (2035)	Estimated Demand PCP per 100,000 population (2035)	Estimated Surplus or Deficit per 100,000 Population (2035) - FTE	Estimated Surplus or Deficit per 100,000 Population (2035) - Percentage
Amery	74.6	29.9%	60.53	96.97	(36.44)	(37.6%)
Antigo	49.7	11.3%	35.02	55.36	(20.34)	(36.7%)
Appleton	64.7	27.6%	73.31	82.53	(9.21)	(11.2%)
Arcadia	23.4	19.8%	23.75	37.74	(13.99)	(37.1%)
Ashland	43.7	10.5%	28.41	48.47	(20.06)	(41.4%)
Baldwin	19.5	39.7%	26.31	38.85	(12.54)	(32.3%)
Baraboo	87.4	29.0%	78.60	112.69	(34.08)	(30.2%)
Barron	50.7	18.0%	64.16	59.83	4.33	7.2%
Beaver Dam	44.4	19.2%	27.41	53.15	(25.74)	(48.4%)
Beloit	51.9	19.5%	49.18	62.00	(12.83)	(20.7%)
Berlin	42.6	8.4%	28.99	46.59	(17.59)	(37.8%)
Black River Falls	110.3	21.8%	74.57	134.42	(59.84)	(44.5%)
Bloomer	77.3	17.8%	85.66	91.14	(5.47)	(6.0%)
Boscobel	40.1	8.9%	65.96	47.23	18.73	39.7%
Brookfield	146.1	25.1%	123.02	182.87	(59.85)	(32.7%)
Burlington	36.2	17.7%	30.48	43.21	(12.73)	(29.5%)
Chilton	5.3	33.6%	14.22	68.31	(54.10)	(79.2%)
Chippewa Falls	69.6	17.8%	62.36	81.98	(19.62)	(23.9%)
Columbus	48.7	26.8%	50.56	61.92	(11.36)	(18.3%)
Cudahy	52.0	8.6%	43.81	56.53	(12.71)	(22.5%)
Cumberland	35.4	18.0%	32.51	45.79	(13.28)	(29.0%)
Darlington	63.9	11.2%	81.22	70.98	10.24	14.4%
Dodgeville	44.0	24.6%	54.81	55.53	(0.72)	(1.3%)
Durand	20.8	7.7%	21.68	33.75	(12.07)	(35.8%)
Eagle River	3.1	19.8%	14.20	177.53	(163.33)	(92.0%)
Eau Claire	111.4	17.1%	156.42	130.45	25.97	19.9%
Edgerton	85.3	19.5%	83.27	101.94	(18.67)	(18.3%)
Elkhorn	58.9	30.1%	55.65	76.56	(20.91)	(27.3%)
Fond Du Lac	51.4	17.8%	43.25	60.52	(17.27)	(28.5%)
Fort Atkinson	45.6	24.1%	28.19	56.74	(28.55)	(50.3%)
Friendship	16.8	24.0%	25.05	38.39	(13.34)	(34.7%)
Grantsburg	37.7	24.1%	33.02	49.68	(16.66)	(33.5%)

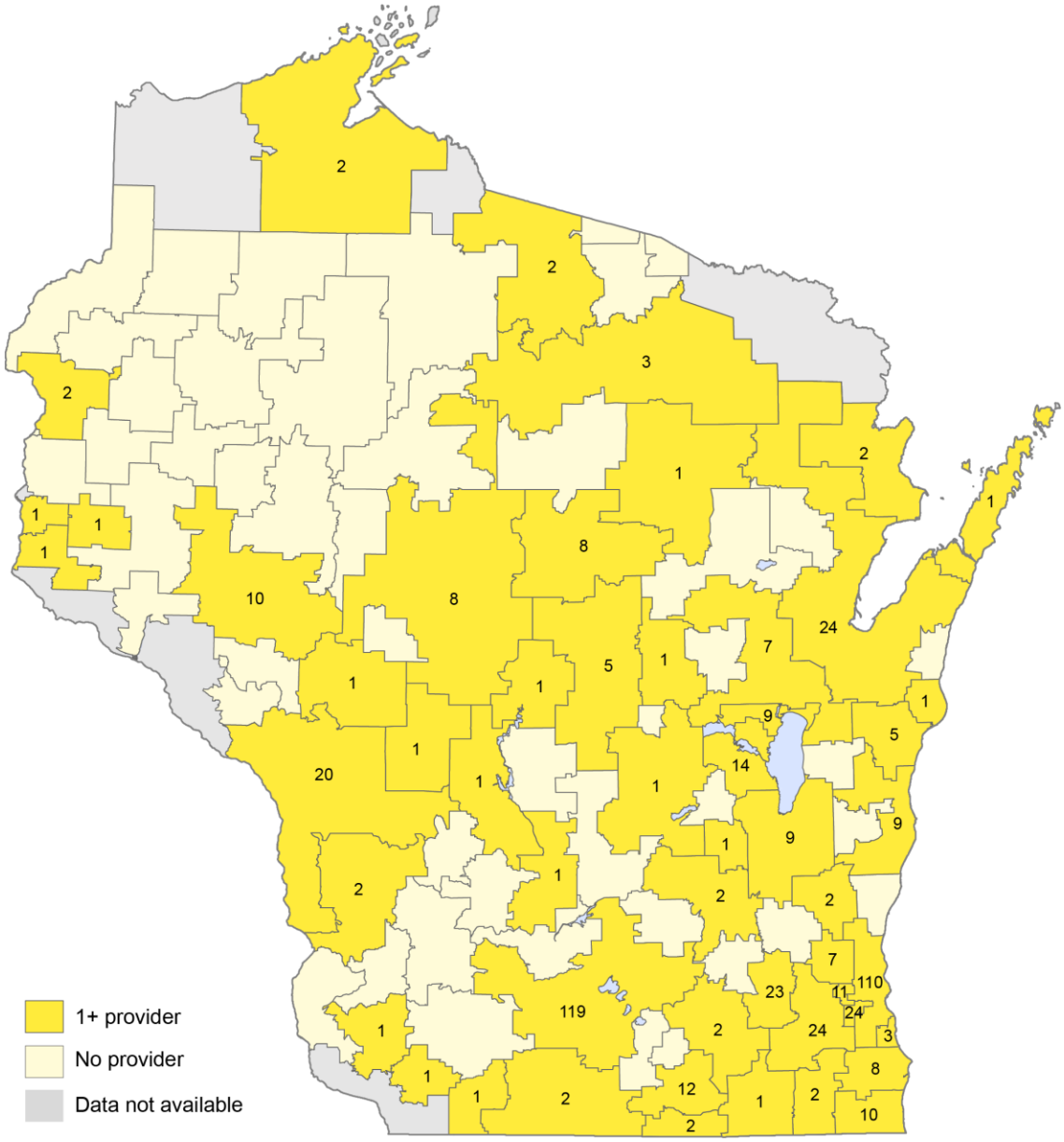
Hospital Service Area	PCP per 100,000 population	Estimated Percent Change in Demand for PCPs (2035)	Estimated Supply PCP per 100,000 population (2035)	Estimated Demand PCP per 100,000 population (2035)	Estimated Surplus or Deficit per 100,000 Population (2035) - FTE	Estimated Surplus or Deficit per 100,000 Population (2035) - Percentage
Green Bay	57.7	30.3%	60.66	75.11	(14.45)	(19.2%)
Hartford	46.6	30.7%	39.25	61.11	(21.86)	(35.8%)
Hayward	113.0	17.2%	77.69	132.41	(54.72)	(41.3%)
Hillsboro	46.6	24.9%	55.15	58.85	(3.70)	(6.3%)
Hudson	75.2	39.7%	70.21	105.00	(34.79)	(33.1%)
Janesville	79.6	19.5%	87.08	95.04	(7.96)	(8.4%)
Kenosha	51.7	29.2%	43.57	66.83	(23.27)	(34.8%)
Kewaunee	7.4	15.9%	6.26	99.18	(92.93)	(93.7%)
La Crosse	109.4	17.9%	147.44	129.04	18.40	14.3%
Ladysmith	22.9	5.0%	21.24	31.73	(10.50)	(33.1%)
Lancaster	66.5	8.9%	50.53	72.35	(21.83)	(30.2%)
Madison	113.6	27.0%	125.37	144.20	(18.83)	(13.1%)
Manitowoc	42.8	10.6%	36.07	47.64	(11.57)	(24.3%)
Marinette	66.0	14.2%	55.67	75.40	(19.73)	(26.2%)
Marshfield	99.7	8.0%	82.70	107.65	(24.95)	(23.2%)
Mauston	79.6	19.4%	49.21	95.09	(45.87)	(48.2%)
Medford	47.6	14.2%	47.04	54.71	(7.67)	(14.0%)
Menomonee Falls	78.5	25.1%	87.58	98.28	(10.70)	(10.9%)
Menomonie	61.0	16.9%	49.76	71.27	(21.51)	(30.2%)
Merrill	45.9	18.5%	58.96	54.74	4.22	7.7%
Milwaukee	97.6	8.6%	107.54	106.02	1.52	1.4%
Monroe	53.4	22.3%	66.85	65.34	1.51	2.3%
Neenah	58.8	20.8%	52.68	70.99	(18.31)	(25.8%)
Neillsville	59.8	23.9%	54.94	74.05	(19.11)	(25.8%)
New London	46.5	19.1%	34.41	55.73	(21.32)	(38.3%)
New Richmond	34.6	39.7%	34.17	50.03	(15.86)	(31.7%)
Oconomowoc	76.8	25.1%	77.76	96.13	(18.38)	(9.1%)
Oconto Falls	24.5	28.7%	38.12	39.94	(1.81)	(4.5%)
Osceola	109.5	29.9%	82.58	142.35	(59.77)	(42.0%)
Oshkosh	67.3	20.8%	56.70	81.37	(24.67)	(30.3%)
Park Falls	42.5	3.9%	34.54	45.53	(10.98)	(24.1%)
Phelps	22.4	19.8%	26.43	85.56	(59.13)	(69.1%)
Platteville	20.6	8.9%	16.01	26.71	(10.71)	(40.1%)
Plymouth	40.0	18.3%	33.71	48.64	(14.93)	(30.7%)
Port Washington	71.4	18.9%	60.15	84.95	(24.80)	(29.2%)
Portage	51.1	26.8%	63.47	64.85	(1.38)	(2.1%)
Prairie Du Chien	82.1	15.8%	58.54	95.02	(36.48)	(38.4%)
Prairie Du Sac	58.3	29.0%	40.06	75.20	(35.13)	(46.7%)

Hospital Service Area	PCP per 100,000 population	Estimated Percent Change in Demand for PCPs (2035)	Estimated Supply PCP per 100,000 population (2035)	Estimated Demand PCP per 100,000 population (2035)	Estimated Surplus or Deficit per 100,000 Population (2035) - FTE	Estimated Surplus or Deficit per 100,000 Population (2035) - Percentage
Racine	51.6	17.7%	50.03	60.73	(10.71)	(17.6%)
Reedsburg	42.1	29.0%	31.49	55.22	(23.73)	(43.0%)
Rhinelander	70.7	19.8%	52.36	84.68	(32.32)	(38.2%)
Rice Lake	103.3	18.0%	83.09	121.88	(38.79)	(31.8%)
Richland Center	65.1	11.5%	60.35	72.54	(12.19)	(16.8%)
Ripon	35.0	17.8%	41.67	45.16	(3.49)	(7.7%)
River Falls	18.9	20.9%	19.26	26.99	(7.72)	(28.6%)
Shawano	60.4	19.1%	45.31	71.93	(26.62)	(37.0%)
Sheboygan	65.3	18.3%	54.96	77.22	(22.26)	(28.8%)
Shell Lake	33.6	25.7%	31.40	46.97	(15.56)	(33.1%)
Spooner	69.6	25.7%	53.20	87.51	(34.32)	(39.2%)
St. Croix Falls	82.9	29.9%	62.87	107.76	(44.89)	(41.7%)
Stanley	14.6	23.9%	19.03	40.46	(21.43)	(53.0%)
Stevens Point	42.2	15.5%	55.16	48.97	6.19	12.6%
Stoughton	37.3	19.5%	36.10	45.77	(9.67)	(21.1%)
Sturgeon Bay	110.9	12.1%	97.92	124.39	(26.47)	(21.3%)
Tomah	120.6	25.3%	98.05	151.05	(52.99)	(35.1%)
Two Rivers	68.1	10.6%	57.42	75.32	(17.90)	(23.8%)
Viroqua	89.3	24.9%	59.77	111.57	(51.80)	(46.4%)
Watertown	35.4	24.1%	21.85	45.19	(23.34)	(51.6%)
Waukesha	90.2	25.1%	91.01	112.90	(21.89)	(19.4%)
Waupaca	58.9	19.1%	45.66	70.13	(24.47)	(34.9%)
Waupun	51.2	17.8%	50.91	60.30	(9.39)	(15.6%)
Wausau	83.8	19.3%	110.02	99.96	10.06	10.1%
West Allis	152.1	25.1%	176.83	190.39	(13.56)	(7.1%)
West Bend	54.4	30.7%	57.07	71.07	(14.00)	(19.7%)
Whitehall	32.3	19.8%	38.73	44.93	(6.19)	(13.8%)
Wild Rose	143.5	23.2%	125.28	176.83	(51.55)	(29.2%)
Wisconsin Rapids	59.7	8.0%	40.70	64.43	(23.73)	(36.8%)
Woodruff	82.5	19.8%	97.43	98.86	(1.43)	(1.4%)

Appendix VI. Behavioral Health Specialists

The map below illustrates distribution of behavioral health providers across Wisconsin. The majority of psychiatrists are located in Dane and Milwaukee counties, with a significant area of Wisconsin lacking any access to in-person psychiatry services (light yellow areas). 46 of Wisconsin's 100 HSAs do not have a behavioral health provider located in the area. However, psychiatrists only provide a portion of behavioral health care, and patients may have access from other providers or through telehealth support services. While previous maps show physicians per 100,000 population, the map below simply illustrates the total BH physician FTE equivalent in each HSA.

Map 10. Behavioral Health Physician to Population Ratio, by HSA



Data Source: WCMEW analysis of WMS physician database and DOA population data.

Appendix VII. Categorization of Specialties, By Specialty Area

To categorize over 160 individual reported specialties, WCMEW used the American Association of Medical Colleges taxonomy of Primary Care, Medical, Surgical, and Other, and additionally separated Psychiatry and related fields into a new Behavioral Health category.[41] For the purposes of this report, Behavioral Health specialists are not considered Primary Care providers, nor are Obstetrics / Gynecology specialists.

Primary Care
General & Family Medicine
General IM
General Pediatrics
Geriatric Medicine
General Practice
General Preventive Medicine
Internal Medicine (Preventive Medicine)
Public Health & General Preventive Medicine

Medical Specialties
Allergy & Immunology
Cardiology
Critical Care
Dermatology
Endocrinology
Hematology & Oncology
Infectious Diseases
Neo-natal-perinatal Medicine
Nephrology
Pulmonology
Rheumatology
Cardiovascular Diseases
Dermatopathology
Endocrinology Diabetes & Metabolism
Gastroenterology
Gynecological Oncology
Hematology (Internal Medicine)
Hematology (Pathology)
Interventional Cardiology
Medical Oncology
Pediatric Allergy
Pediatric Cardiology
Pediatric Critical Care Medicine
Pediatric Dermatology
Pediatric Endocrinology
Pediatric Gastroenterology
Pediatric Hematology/Oncology
Pediatric Infectious Disease
Pediatric Nephrology
Pediatric Pulmonology
Pediatric Rheumatology
Pulmonary Critical Care Medicine
Radiation Oncology
Reproductive Endocrinology

Surgical Specialties
General Surgery
Colorectal Surgery
Neurological Surgery
Obstetrics & Gynecology
Ophthalmology
Orthopedic surgery
Otolaryngology
Plastic Surgery
Thoracic Surgery
Urology
Vascular surgery
Endovascular Surgical Neuroradiology
Female Pelvic Medicine & Reconstructive Surgery, OB/Gyn
Oral & Maxillofacial Surgery
Pediatric Cardiothoracic Surgery
Pediatric Ophthalmology
Pediatric Otolaryngology
Pediatric Surgery
Sports Medicine (Orthopedic Surgery)
Surgical Critical Care (Surgery)
Surgical Oncology
Thoracic Surgery
Trauma Surgery
Vascular Surgery
Hand Surgery
Adult Reconstructive Orthopedics
Foot & Ankle Orthopedics
Gynecology
Maternal and Fetal Medicine
Occupational Medicine
Orthopedic Trauma
Pediatric Orthopedics

Other Specialties
Anesthesiology
Emergency Med
Neurology

[41] Workforce and Data Reports, Association of American Medical Colleges.

Pathology
Physical Medicine and Rehab
Radiology
Aerospace Medicine
Blood Banking/Transfusion Medicine
Child Abuse Pediatrics
Child Neurology
Clinical Biochemical Genetics
Clinical Cardiac Electrophysiology
Clinical Genetics
Clinical Neurophysiology
Clinical Pharmacology
Cytopathology
Diagnostic Radiology
Flexible or Transitional
Forensic Pathology
Hepatology
Hospitalist
Internal Medicine (Emergency Medicine)
Internal Medicine and Neurology
Legal Medicine
Medical Genetics
Medical Management
Medical Toxicology (Emergency Medicine)
Medical Toxicology (Preventive Medicine)
Molecular Genetic Pathology (Pathology)
Musculoskeletal Radiology
Neurology/Diagnostic Radiology/Neuroradiology
Neuromusculoskeletal Medicine
Neuropathology
Nuclear Medicine
Osteopathic Manipulative Medicine
Pain Management (Phys Med & Rehab)
Palliative Medicine
Pain Management
Pediatric Anesthesiology (Pediatrics)
Pediatric Emergency Medicine (Emergency Medicine)
Pediatric Emergency Medicine (Pediatrics)
Pediatric Pathology
Pediatric Radiology
Pediatric Rehabilitation Medicine
Phlebology
Selective Pathology
Sleep Medicine
Spinal Cord Injury Medicine
Sports Medicine (Internal Medicine)
Sports Medicine (Family Practice)
Sports Medicine(Pediatrics)
Transplant Hepatology (Internal Medicine)
Unspecified specialty
Vascular and Interventional Radiology
Vascular Medicine
Vascular Neurology
Urgent Care Medicine

Behavioral Health
Psychiatry
Addiction Medicine
Addiction Psychiatry
Forensic Psychiatry
Geriatric Psychiatry
Pediatrics Psychiatry/Child Psychiatry
Psychiatry/Neurology
Psychoanalysis
Psychosomatic Medicine


WISCONSIN

For questions about this report please visit www.wcmew.org

Or contact:
George Quinn
WCMEW Executive Director
gquinn@wcmew.org
(608) 616-5189

Wisconsin Council on Medical Education & Workforce

WMCEW is a non-profit, multi-stakeholder organization whose purpose is to facilitate strategies to ensure an adequate supply of health care providers to meet the needs of Wisconsin citizens today and into the future.

2018 Healthcare Workforce Report